Information in Dentistry:
patterns of communication and use

A thesis submitted in fulfilment
of the requirements for the degree of
Doctor of Philosophy

at

The University of Sheffield

by

Susana Soto, M.A.

Department of Information Studies
March 1992

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ABSTRACT

The aim of the present study is to develop an explanation of the information-seeking behaviour of dental professionals that relates the three main instances of this behaviour (users, their information needs, use of information sources) in a meaningful way. The research looks into the information-seeking behaviour of one of the less investigated groups of health practitioners and it does so from a qualitative point of view, using data collected by means of semi-structured interviews.

110 dental professionals were interviewed between May 1989 and June 1990. The interviewees were dental professionals in Sheffield District Health Authority (postgraduate students; academic staff; community service dentists; hospital staff and general dental practitioners).

A coding paradigm based on grounded theory was applied to analyze their replies. This basic paradigm explains the information-seeking behaviour of dental professionals in terms of 'conditions' that provoke seeking information; 'strategies' implemented to seek information; 'interactions' the ways in which information sources are used.

The conditions for their information needs are created by their clinical tasks (diagnosis, treatment and delivery of dentistry) or their academic tasks (teaching and lecturing, research and publications). Dental professionals apply six basic strategies for seeking information: **Reading, Talking, Enquiring, Attending/organizing continuing education events, Watching and Using the library.** Each of these strategies is associated with the use of certain information sources: **Reading** with written/printed literature, **Talking** with colleagues, **Enquiring** with individuals from other occupations or professions, **Attending...** with courses and conferences, **Watching** with audiovisual materials and **Using the library** with the use of printed literature via a library service.

While the strategies are common to every subgroup in the study, the actual patterns of information-seeking vary from subgroup to subgroup because the strategies are implemented in different ways by each of them. The reason for this variation is determined by the particular combination of clinical and academic tasks of each subgroup.

The findings – apart from describing how a representative group of dental professionals uses a variety of information sources – have several implications for library and information services, computer applications, dental training and further research in health care user studies.

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Chapter 1

Introduction

The present research explores how dental professionals seek information in order to
satisfy information needs provoked by their professional tasks. As such, the research
can be considered a user study. But as a user study, the research looks into some less
investigated aspects of user studies in health care.

The scope of user studies in health care includes all kinds of health profession-
als as well as patients and health managers. Despite the fact that research is being
carried out about all these three major groups of users, some groups have received
more attention than others. For example, in the case of health practitioners user
studies have been centred on one category of users, namely the medical practition-
ers. However, they are just one group of health practitioners. Findings about their
information-seeking behaviour cannot be extrapolated to other health practitioners
who have a different professional background, different work roles and therefore their
information needs appear in a different context from that of medical practitioners. Re-
search has also paid more attention to the use of specific information sources, namely
library-related ones (printed literature, abstracts, data-bases) and the evaluation of
specific information services (for example, use of a university dental library by gen-
eral dental practitioners) than to the overall information-seeking behaviour of users.
Finally, regarding methods of data collection, research has relied on self-completed
questionnaires leading to quantitative analysis.

As a consequence, there are still several lines of enquiry for further research re-
garding user studies in health care. These are:

- exploring certain categories of users other than medical practitioners;

- trying methods of data collection other than self-administered questionnaires;

- developing qualitative interpretations of information-seeking behaviour that in-
  tegrate user characteristics, their information needs and how these information
  needs are satisfied.

The present research combines these three lines of enquiry. It looks into the
information-seeking behaviour of dental professionals, one of the less investigated
groups of health practitioners. It does so from a qualitative point of view, using data
collected by means of semi-structured interviews. Interviewing has not been the main
method of data collection in previous user studies on dentists, and qualitative analysis
of information-seeking behaviour has not been tried before on that particular group
of users. While the central objective is studying the information-seeking behaviour

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of dental practitioners, the researcher has also looked for a different methodological approach.

The next three chapters describe the state of user studies in general, in health care and in Dentistry, respectively. Chapter 2 follows the development of user studies as a field of research in Library and Information Science, from the 1950's to 1990. It is not an exhaustive history of user studies. On the one hand, it is focused on the progress of methodology and theory rather than on the actual results of the studies. On the other hand, that development has been traced by analyzing the reviews on *'Information Needs and Uses'* published in the *Annual Review of Information Science and Technology* (ARIST) from 1966 to 1990. Chapter 3 follows the progress of user studies in health care, and again that progress is focused on the search for a new methodological approach. Chapter 4 reviews exhaustively the design and results of user studies in Dentistry. The common link of these chapters is to illustrate how research based on a hypothetico-deductive paradigm has slowly turned to a holistic-inductive paradigm in order to further our knowledge of how users behave when they seek information.

Chapter 5 describes how a holistic-inductive paradigm was applied in the present study. It also explains how grounded theory analysis was used for analyzing data and building a model of the information-seeking behaviour of dental professionals *'grounded'* on their own perception of that behaviour.

The results of the study are presented in Chapters 6, 7, 8, 9 and 10, describing the information-seeking behaviour of each group of dental professionals interviewed: *general dental practitioners, hospital staff, community service dentists, academic staff* and *postgraduate students.* These descriptions constitute the evidence on which the model explained in Chapter 5 is based.

Chapter 11 summarizes the results highlighting the similarities and differences of information-seeking behaviour amongst the different groups of dental professionals; it also relates these results to our initial knowledge about dental professionals information-seeking behaviour.

Finally, Chapter 12 presents the main implications – both of the findings and the methodology – regarding library and information services, computer applications, dental training and further research in health care user studies.

Chapter 2

User Studies

2.1 The Outset

During the last four decades most of the research in Library and Information Science has been focused either on user studies or the design of information retrieval systems (Wilson, 1981b). Information users and information systems are two components of the same process: communication of information. It seems obvious, then, to consider these two areas of research as dependent on each other's findings. However this has not always been the case.

As we will see during this chapter, user studies have been constantly hindered by methodological problems. They have been challenged by issues such as the reliability and validity of data, and finding an appropriate model or conceptual framework to guide data collection and analysis. Moreover, the key question of a unifying theory of user studies is still unresolved (Rohde, 1986). It is not surprising that their findings have not been fully accepted.

On the other hand, the design of information retrieval systems has been firmly rooted in a positivist model of library and information services (Streatfield, 1983). This model has assumed that information has an objective existence; therefore information systems can store, control and manipulate it in order to satisfy the information needs of their intended users, and finally users satisfy their information needs interacting with such systems (Dervin, 1977; Streatfield, 1983). Even when this model was eventually challenged in the late 1970's, it was difficult to abandon it (Brittain, 1982; Streatfield, 1983). The new trends in the design and evaluation of information retrieval systems in the early 1980's still remained system-centred in the sense that they constructed an *a priori* model of user behaviour (Ellis, 1987).

The traditional model of library and information services has treated user studies with great scepticism. Taube (1959), in a review covering the early days of user studies, offers a very negative opinion about their value. He goes as far as to state:

> '*It is the contention of this paper that the provision of scientific information services is a professional activity and hence the value of such services cannot be measured by use studies*' *(Taube, 1959 p.56).*

and later on, he adds:

> '*The inevitable conclusion of this paper is that use studies have no value as direct guides to the design of information systems, any more than con-*

sumer acceptance or rejection is a guide to the value of the Salk vaccine'
(op.cit., p.58).

On the basis of previous reviews concerned with studies of the use of library subject catalogues[1], he rejects at once quantitative studies, because they cannot provide enough information, and qualitative studies, because they are both impossible and useless. His only concession is to recognize that user studies have a relative value regarding user training.

We can sum up the state of the art of user studies, 30 years ago, in these terms: the information officer/librarian in his/her professional capacity of providing scientific information services knows best how to design and manage these services. It is of no consequence what the user thinks of, and expects from them; how and why the user exploits them; what the user does when s/he needs information. If the user fails to use a formal information system when s/he needs information, then a user study can be useful to show how bad the users are and what they need to be taught.

Thirty years ago, user studies looked almost condemned to disappear from the main stream of research in Library and Information Science, but they did not. In 1966 the Annual Review of Information Science and Technology (ARIST) published the first of a regular series of reviews on *'Information Needs and Uses'.* The eleven reviews[2], that have been published so far, have examined several hundred user studies that have covered an increasing number of disciplines and have also tried a number of different techniques. They are undoubtedly a useful source to observe how this area of Library and Information Science has developed throughout this period. But the reviews in themselves are also a valuable source in examining how the subject coverage, the methodology and the conceptual framework of user studies have developed (Rohde, 1986).

2.2 The Development

In the 50's and 60's user studies were almost entirely focused on the information needs of scientists from both pure and applied scientific disciplines[3]. Until 1971 the ARIST's reviews included studies in Science and Technology only. As the field of user studies turned its attention to the Social Sciences and Humanities, the reviews enlarged their scope and by 1986 the review by Dervin & Nilan included not only any discipline, but also any kind of user in a particular environment. Scientists are no longer regarded as the exclusive users of information; every member of a community, profession or organization, every individual, in sum, is acknowledged as an information user (Martyn, 1974; Crawford, 1978). Therefore, information systems have to meet successfully the differential information needs of a variety of users, and in turn this fact explains why user studies have remained as one of the main topics of research in Library and Information Science, despite the scepticism that they deserved in the fifties.

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[1]See Frarey (1953) and Lilley (1954). They make opposite proposals for further studies of use of the subject catalogue. Frarey is an early supporter of a qualitative approach, centred on the user; while Lilley advocates quantitative studies centred on the characteristics of the subject catalogue itself.

[2]See: Menzel, 1966; Herner & Herner, 1967; Paisley, 1968; Allen, 1969; Lipetz, 1970; Crane, 1971; Lin & Garvey, 1972; Martyn, 1974; Crawford, 1978; Derwin & Nilan, 1986; Hewins, 1990.

[3]See user studies reviewed by Taube (1959).

The methodology of user studies has been the target of constant criticism. Menzel (1966) points out, in his final comments, that despite the observed technical improvement of user studies, *'researchers still fail to take advantage of the available contributions of behavioral science'(op.cit., p.68)*.

The next review complains that techniques have been used in a *'crude'* and *'precarious'* way (Herner & Herner, 1967). However, Paisley (1968) acknowledges that the traditional techniques of questionnaires, diaries and interviews have become our main source about users and their information needs. Since all of them have some disadvantages, he recommends an eclectic approach, i.e. to combine two or more techniques in order to improve internal validation of the studies.

A more optimistic view is offered by Crawford (1978), at the end of this period:

> *'Most use studies have continued to be practical ventures, but there is evidence of increasing refinement in conceptualization and methodology. Social Science concepts combined with quantitative techniques have produced some effective case reports and field studies' (Crawford, 1978 p.71).*

The last two ARIST reviews, published in 1986 and 1990 have definitely abandoned the long standing complaints about methodology. The period 1978-1986 witnessed a remarkable improvement in the techniques of data collection and analysis and signalled the emergence of innovative approaches to user studies (Dervin & Nilan, 1986); that trend continued over the 1986-1989 period (Hewins, 1990). These changes are closely related to the formulation of a conceptual framework, the third aspect in the development of user studies that is documented by the ARIST reviews.

A characteristic of user studies in the 1960's is the application of single techniques of social research, for example: interviewing, observation, questionnaires, diaries, etc. By and large, they are descriptive studies, and hypothesis testing is not the main objective (Herner & Herner, 1967). By the end of the decade techniques had been mastered and the time had come to advocate stronger conceptualization of the theory of user studies (Paisley, 1968).

Herner & Herner (1967) proposed an understanding of user studies in terms of a communication model that distinguishes between, information sources as originators of messages, users as recipients of messages, channels/media as means to transfer the messages, activities performed by originators/recipients to send/receive messages and the messages that become information when they are received by the user. They define information as messages that have been acknowledged by the user, and as a consequence they identify two types of information needs: i) information needs in terms of the messages themselves, i.e.: the contents of the messages; ii) information needs in terms of the means selected to satisfy them. A *'typical'* user study – in their opinion – deals with the first type of needs, because the satisfaction of the second type is eventually the responsibility of the the information specialist.

The communication model of information transference has been useful to display the complex phenomena that user studies attempt to explain, particularly at that time, when user studies were firmly focused on the use of library-related information sources[4]. Also, it has helped to decide at the design stage of a user study, whether the study is focused on components such as: sources, users, messages or on interactions

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[4]The concept of library-related information sources such as: books, journals, printed indexes, library catalogues, or databases is taken from Elayyan (1988).

between these components, as for example: reading, searching catalogues/indexes, attending conferences, etc.

However, their distinction between information needs related to the contents of the messages and information needs related to the means of providing those messages kept user studies constrained by the designer-centred approach to information systems of the 1950's. The counterpart of this approach in the field of user studies was to assume that i) information needs could be satisfied by efficient formal information systems; ii) once the information needs were uncovered, the information specialist could design the most efficient system to satisfy them. Thus Herner & Herner (1967) consider it legitimate for a user study to find out what the user needs. They go as far as to concede that there is some value in finding out the user preferences for certain means of obtaining information, but the provision of information services remains the sole responsibility of the information specialist, who will take into consideration the contents of the information needs and will decide what is the most efficient means to satisfy them. It is still a long way off from the idea that understanding the information-seeking behaviour of users in the broadest possible sense is the key to improving the design of information retrieval systems.

Paisley (1968) formulates a conceptual framework to understand user needs and to interpret user studies. The user (in his case, still the scientist or technologist) interacts with ten different systems. They are: the cultural system, the political system, the membership group, the reference group, the invisible college, the formal organization, the work team, the individual, the legal/economic system and the formal information system. The first eight systems (from the macro-environment of the scientist's culture to the micro-environment of the scientist's individual mind) are inclusive of each other, supporting eventually the individual's own information system; while the last two, the legal/economic system and the formal information system, are superimposed onto any of the former. Each of them possesses their own flow of information; therefore information needs and the means to meet them are particular to every system.

Paisley (1968) goes a step further than Herner (1967). While the latter proposes a model to understand the basic process a user study has to deal with, Paisley offers a conceptual framework that displays all the different environments where this communication process can happen. However, when we look at the studies in his review, we realize that techniques have become more sophisticated and results are richer, but theory has not grown in the same way. Only the studies centred on the individual's information system have advanced in the conceptualization path; they have proposed the concepts of *'perceived utility'*[5] and *'perceived relevance'*[6] to rank the value of documents and communication channels. Although these studies are concerned with the definition of relevance measures to evaluate the performance of information retrieval systems and the development of a suitable methodology to do so, they have disclosed

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[5]See Gerstberger & Allen (1968); they found empirical evidence that the utility of the information sources relies on accessibility in the first place and then on quality and that accessibility is related to experience of the user in dealing with the source.

[6]See Cuadra & Katter (1967); the relevance judgement process was the focus of an extensive research project carried out by Cuadra and his team. The set of studies showed that relevance judgements were highly variable depending on personal characteristics of individuals, type of document, and type of information requested. At the same time as the studies used a traditional experimental design with *a priori* defined judgement scales, they also discovered that the design itself influenced the way relevance was perceived. Similar results were obtained by Rees & Schultz (1967).

the complexity of user seeking behaviour.

Once the expertise in handling the technical side of the research has been achieved, more attention is paid to developing explanations that can make sense of the obtained results; explanations that can grasp the variability of the user seeking behaviour within a theory of general application. By the end of the decade research on user studies is consolidated along three main lines: i) cognitive psychology: studies centred on the individual and his/her own information system; ii) organizational psychology and sociology: studies of the information flow within organizations; iii) sociology of science: studies of communication in Science (Allen, 1969).

The beginning of the 1970's saw a renewed interest in the study of the patterns of informal information exchange amongst scientists/technologists. The studies looked for specific patterns at macro, organizational and meeting levels (Lin & Garvey, 1972).

In the first case, Crane (1969) tested the 'invisible college hypothesis' in the context of innovation diffusion. Her study could not totally prove the existence of invisible colleges, but it did prove that social organization existed in research areas; its main characteristic was a network of informal information exchange.

In the second case Allen et al.(1971) studied the flow of communication within organizations. That flow had been traditionally understood as a single communication process between receiver (member of the organization) and source (printed literature or external contact). Allen's research showed that the process was, in fact, a two-step one. Members of the organization used some of their colleagues as information sources, the so-called 'communication stars'. Allen carried on his hypothesis to disclose that some of these communication stars were very active in terms of internal and external contacts, becoming the key individuals in the transfer of technology, and he called them 'technological gatekeepers'. He tested this model of communication at macro level to study the international transfer of technology, namely between developed and developing countries. The study showed that the transfer was also a two-step process, channelled through key individuals operating as international gatekeepers.

Allen's model of communication proved to be more operative than the elusive hypothesis of 'the invisible college', because 'communication stars' and 'technological gatekeepers' could be identified within the organization, allowing a more concrete description of the informal communication network.

In the third case, research carried out at the Centre for Research in Scientific Communication of the Johns Hopkins University and by the American Psychological Association identified organizational factors (programme structure, selection of presentations) and communication factors (communication skills of chairmen and speakers, informal conversations and language translations) affecting the exchange of information in meetings (Lin & Garvey, 1972).

All these communication studies explained information-seeking behaviour from a wider perspective. In turn, they became the key to a re-assessment of the role of formal information systems within particular groups of users, for example practitioners.

At the same time, a number of user studies continued to look into the relationship between information needs and information sources, i.e.: which information needs were satisfied by which information sources. Large scale surveys (based on mailed-questionnaires, partially validated by observation and interviews, like the INFROSS project by the Bath University Library Group in U.K.) were attempted by the first time.

User studies were growing in the complexity of design and the number of contribu-

tions outside the U.S.A. However, they failed to offer a model of information-seeking behaviour, due to a lack of theory. As a solution Lin & Garvey (1972) proposed the application of the communication model to explain user interactions with information sources.

Brittain (1975) reviewed the state of user studies from a purely methodological point of view. So far, the methods most commonly used were: questionnaire, interviewing, diary, direct observation, and analysis of documentary sources such as: circulation records, queries to a reference service, on-line searches, user profiles, etc. The last group had been the most successful in providing reliable data about specific services, and therefore results from this kind of user study were more easily applied to improve existing information services. However, several problems remained regarding the application of the other techniques. Brittain (1975) criticized in detail questionnaires and interviews, pointing out that: i) questions were often defined from the information specialist point of view, who in turn was biased towards formal information systems and assumed a similar bias in case of the user; ii) data was based upon what the interviewee was able to recall at a certain point in time; data was not gathered over a period, to find out changing patterns; iii) studies were biased to information needs usually satisfied via documents. On one hand, he proposed to improve existing techniques by i) collecting data about the user needs from the user point of view; ii) performing longitudinal rather than single studies; iii) applying more rigorous statistical analysis. On the other hand, he recommended the application of new approaches such as the Delphi technique to predict future information needs and continuous assessment of user behaviour to monitor the performance of a specific information system.

Brittain (1975) also identifies the main weakness of user studies regarding the development of a general theory: results, though valuable in themselves, do not accumulate in a consistent body of concepts of universal application.

The root of this problem is interpreted in strictly methodological terms: results are not easily accumulated or compared because different criteria are used to define populations, apply methods, analyse and present results.

By the end of the seventies user studies had progressed from the restrictive notion of information user as the scientist/technologist to a broad concept of user as any individual seeking information. Secondly, the basic techniques of social research have all been extensively tried, but there is a preference for a survey approach using self-administered questionnaire and quantitative analysis. Thirdly, the model of communication process has provided a conceptual background, which does not solve the lack of theory but it helps to understand the process of information exchange.

Finally, a different approach to information system design has made a long term impact on user studies. Paisley & Parker (1965) define an information retrieval system as a 'receiver-controlled communication system'. Paysley's model has gradually brought about changes both to system design and to user studies: i) an information retrieval system has to be designed and evaluated to accord with the user's preferences, the user's needs and the user's seeking-behaviour; ii) the study of the user seeking-behaviour has to extend its scope in order to include all kinds of information sources available through formal and informal communication systems; iii) behavioural research is the means to identify the genuine information needs of users.

The focus of attention has moved from the system and its attributes to the users and their characteristics.

2.3 The Change of Paradigm

The traditional model of library and information services has been considered as the inheritance of positivism (Streatfield, 1983). Positivism has also influenced our modes of enquiry in Library and Information Science (Rohde, 1986). The rest of this chapter will specifically examine this influence and its consequences for user studies[7].

Hughes (1980) enumerates the four basic characteristics of Positivism as: i) reality is external to the knower; ii) epistemology is the central issue of Philosophy; iii) unity of method between the Natural and the Social Sciences; iv) discrimination between facts and values, that accepts the former within the domain of Science and dismisses the latter.

Positivism understands reality as independent from the knower; reality has an objective existence of its own.

Instead of ontological questions about what exists, epistemological issues are central to the positivist conception. Positivism is mainly concerned with the valid ways of knowing about reality. Philosophy or, strictly speaking, Metaphysics is a by-product of Science. Rather than answering the question 'what is reality?', the positive philosophy strives for the reply to 'how do we know about reality?'. Comte[8] finds that reply in a kind of method that he calls *'positive'* and that under the more generic denomination of 'scientific method' has exerted a pervading influence on our ways of enquiry about natural and social facts throughout the 20th century:

> *'In the final, the positive, state, the mind has given over the vain search after absolute notions, the origin and destination of the universe, and the causes of phenomena, and applies itself to the study of their laws -that is, their invariable relations of succession and resemblance. Reasoning and observation, duly combined, are the means of this knowledge. What is now understood when we speak of an explanation of facts is simply the establishment of a correlation between single phenomena and some general facts, the number of which continually diminishes with the progress of science'* *(Comte, 1983 p.72).*

The recognition of a single mode of enquiry – briefly described above – provides a common foundation for Natural and Social Sciences and leads to the main claim of positive philosophy: the unity of Science.

Science is knowledge about facts that are observable through sensory experience and can be explained in terms of causal laws. The hypothetico-deductive paradigm of the Natural Sciences becomes the paradigm of scientific method. The implication of this paradigm for the Social Sciences is well described by Halfpenny (1979):

> *'Positivists assume that physical events and people's behaviour occur as the law-governed result of a concatenation of many antecedent variables. They want to isolate the numerous laws whose operation in conjunction is observable as the flux of behaviours and events. The aim of their research is twofold: to establish Humean causal connections between variables, that*

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[7]For a detailed review of user studies see Dervin & Nilan (1986); Rohde (1986). The state of research in the late 1980's can be found in Katzer (1987) and the contribution of CRUS in Roberts & Wilson (1988).

[8]Comte, A. *Cours de Philosophie Positive* see Comte (1983).

is to establish laws, and to link these laws into a deductively integrated theory' (Halfpenny, 1979 p.801).

This is the paradigm of research that has dominated user studies until the 1980's.

The assumption of reality as external to the knower has its equivalent in the notion of information as independent from the user. Information or more strictly speaking recorded information, has an objective existence of its own that allows for its storage, organization and retrieval. Then follows as a logical consequence the belief that the more the user knows about the formal organization of information, the better s/he can exploit it. This assumption has prevailed upon the design of information systems for decades (Dervin, 1977), and it is still behind the notion of end-user training. It has also meant that user studies under the positivist sign aim at isolating variables and testing their relationships. Quantitative data has been preferred to qualitative data and statistical analysis has been the prevailing model of explanation (Rohde, 1986).

But there has been another assumption implied by the first one: the user also thinks of information as something with objective existence and it is here that the paradigm starts to fail.

Information is a fundamental component of the user's life at biological, intellectual and affective levels[9]. The user manipulates, produces, has opinions about, attaches meanings and values to it.

The positivist concept of information is incomplete because it refers to information in so far as it is autonomous from the user. This fact explains why user studies have been centred on i) library-related information sources; ii) certain groups of users such as scientists, academics or researchers, who are expected to have structured and well organized information-seeking-behaviour. Here structured and well organized information-seeking behaviour means that they use and are satisfied with formal information systems.

The interaction 'user/information source' is examined using quantitative variables. The 'how many' type of questions are favourite ones: how many loans, queries, searches, visits to the library... Ranking of information sources by users is another recurrent characteristic of this approach; its only explanatory value is to tell us that the information systems that we create and manage are very seldom the top option[10]. Studies on document requests and queries to an information system, analysis of on-line searches and user profiles have been, usually, far more successful than extensive studies about information needs of large groups of users. The former have produced clear cut results, that have led to the improvement of the corresponding library operations (Brittain, 1975). Another influence of the positivist approach is behind the last statement: how the application of results is regarded. The validity of results and hence the general value of user studies is related to effective application for system design.

When findings indicate that certain information sources are not used; that users are not satisfied with certain information services, the model becomes short of explanations. The model can tell us what users do and what they do not do; it can tell us

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[9]See Dawkins (1986) for the concept of information as the essential characteristic of the living organisms; Wilson (1981b) for the concept of I-S-B as the individual's response to satisfy his/her needs; Beniger (1986) for the concept of information as an 'epi-phenomenon' derived from the ability of living systems to process matter and energy in order to control themselves and their environment.

[10]See 4, 4.1.1, 4.1.5 and 4.1.6.

whether the initial hypotheses have been verified or rejected. It can tell us nothing beyond our *a priori* conception of information-seeking behaviour.

The prediction of users' behaviour is very seldom achieved, except for small range studies centred on specific library operations: loans, photocopy requests, etc. The reasons for that are linked to practical research issues such as: representativeness of the sample population, low response rate and selection of variables. Besides no amount of clearly defined measures can describe users' behaviour, even less to predict it in all its aspects. Eventually, no general theory of information-seeking behaviour can be deductively derived from a set of *a priori* hypotheses.

In the early 80's a change of paradigm was far more imperative than methodological improvements. However, this change did not happen abruptly, on the contrary it has developed gradually during the last ten years.

One step has been to combine task, job and environment variables with individual and information variables to provide a model of information-seeking behaviour that not only describes the individual's behaviour but also the information flow within a given organization (Mick et al., 1980):

> *'When considered in relation to one another, these variables provide a description of the dynamics of information flow in the organization and can be used to identify barriers to information flow. It is important to understand, however, that organizations (like individuals) are unique and that cross-organizational analysis must involve higher-level systems to which organizations belong, and not generalization from one organization to another.*
>
> *Information travels through diffuse, complex paths. Individual information behaviors are the product of complex interactions involving personal attitudes, background, role, function, specific task situation, environment, etc. It is highly unlikely that any two individuals would display the same information behaviors, even in response to similar task and environmental situations. The probability of the same "chunk" of information taking the same path from source to receiver is extremely low -even though the receivers may be colleagues working in the same work group. Given these circumstances, management interventions to change information behavior must be tailored to specific situations; they require a detailed understanding of the dynamics of the organization and of the perceptions of both staff and management' (Mick et al., 1980 p.354).*

Here we find a major departure from the traditional positivist model: user's behaviour cannot be reduced to a definite set of laws of general application.

Another step was a re-definition of the concept of information. Dervin (1977) clearly states a three level definition of information:

- objective information that describes external reality

- subjective information that describes internal reality

- information as the behaviours enacted by the individual in the process of understanding reality.

This concept of information rests on the assumption that external and internal realities are different but in constant interaction because of the individual's intervention[11]. The individual makes sense of reality by using data from the external world and reprocessing it with 'his own pictures'.

That making-sense process is a constant re-creation of information that affects both the external and internal realities. In this perspective a systematic enquiry about the cognitive processes of the user and his/her observable behaviour is legitimate. A new methodological approach becomes necessary to cope with this kind of enquiry. Dervin and her research team have developed a methodology based on situational theory to study the communication process in health settings[12] (Rohde, 1986).

Meanwhile, in the U.K., Project INISS made an impact far beyond the limits of social services departments, in the way of new directions for user studies[13].

Wilson and his team moved gradually from a 'scientific paradigm' to a 'naturalistic paradigm', from a quantitative approach to a qualitative approach. The instrument that allowed this shift was the application of structured observation. Although the choice of method in Wilson's words. was 'an accident' [14], that accident happened in the right context. There was dissatisfaction with the results of survey research because they could not discover to a full extent the mechanisms by which the user selects external information and reprocesses it with his/her own descriptions. Also, there was dissatisfaction with questionnaires and interview schedules designed from the information specialist point of view. The specific research project represented, for the research team, a totally unexplored area regarding the information needs of the individuals involved: the social workers. The combination of all these three reasons pointed to field research, still of a quantitative nature, as the alternative solution (Wilson, 1981a). Structured observation proved to be a successful way of data collection. As a consequence of the sheer amount of data to be dealt with, it was decided to apply qualitative analysis in the form of narrative reporting as a parallel presentation to the statistical analysis (See Wilson et al.,1978; Wilson & Streatfield, 1980).

Project INISS is a good example of how the change of paradigm has unfolded gradually rather than abruptly. Its starting point was the traditional hypothetico-deductive model and without dismissing it altogether, it explored new avenues at methodological and theoretical levels.

At methodological level, it has made a place for structured observation and qualitative analysis, proving the validity of their findings and interpretations and producing literature sources, where this approach is explained in the specific context of user studies (Wilson & Streatfield, 1980; 1981 and Wilson, 1981a).

At theoretical level, it was a test for Wilson's ideas about information needs and information-seeking behaviour (Wilson, 1981a). The exposition of Wilson's theory appears in his paper *On user studies and information needs* (1981b). There, Wilson proposes to understand information-seeking behaviour as the search strategies carried

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[11]It is also closely related to new directions in Communication Theory, see Dervin (1980).

[12]See page 18.

[13]Information Needs and Information Services in Local Authority Social Services Departments (Project INISS), for a full description of the project SEE Wilson et al. (1978); Wilson & Streatfield (1980).

[14]Wilson found by chance a copy of Mintzberg's *The Nature of Managerial Work*, SEE Wilson (1981a) p.242.

out by the user in order to satisfy needs. These needs can be physiological, affective or cognitive and they are influenced by the user's work environment, as well as by the social, political and physical environments, in which the user lives. In the course of satisfying these needs, the user may seek information, but information needs do not exist as such; what exists, as a distinctive behaviour, is information-seeking. Undoubtedly personal needs motivate information-seeking in many instances, but social roles and more particularly work roles generate a great deal of information-seeking that is more likely to require the existence of some kind of information system. The needs motivated by work and social roles cannot be exclusively understood in cognitive terms. Users do not seek information only to write a paper, to prepare a lecture or to decide a diagnosis. Underlying these cognitive needs there are affective needs such as the attainment of professional success or the fulfilment of a vocation.

This theoretical position points to a holistic conception of user studies:

> 'In such a wider view the individual would be perceived not merely as driven to seek information for cognitive ends, but as living and working in social settings which create their own motivations to seek information to help satisfy largely affective needs' (Wilson, 1981b p.10).

The direct consequences for research of this position are, i) preference for a qualitative approach as a means to develop new concepts; ii) derivation of a general theory of information-seeking behaviour from in-depth studies of specific categories of users in specific settings; iii) explanation of information-seeking behaviour based on a broader conceptual basis, that borrows contributions not only from communication theory, but from the social sciences as well.

A further elaboration of Wilson's model of information-seeking behaviour has been done by Streatfield in the context of the EMIE Project[15]. While Wilson's model is centred on the idea of information-seeking to satisfy needs arising from the individual's roles and environment, Streatfield's model shows that needs are goal-directed and the attainment of these goals poses problems that may require information-seeking (Wilson, Streatfield & Wersig, 1982). This model reinforces Wilson's theory, centred on the user. Goals are defined by the individual, or by the organizations s/he belongs to, at different work and social levels. The individual needs and the collective needs related to these goals can only be specified by the individuals involved. The information-seeking strategies are selected and executed according to the nature of the required information, their skills, availability of resources and their experience in dealing with them. From this perspective, it is highly unlikely that an a priori model of information-seeking behaviour, biased by document-centred library and information services, can ever match the actual information-seeking of individuals. If our aim is to understand the actual information-seeking behaviour of any given group of users, we need to look at this behaviour in its entirety, as it naturally occurs, and to use an inductive approach, i.e. to discover general patterns from data collected about individual instances of events as they happen or have happened[16]. The holistic-inductive paradigm – developed in the anthropological field studies as an alternative to the paradigm of the natural sciences – can also be an alternative way of exploring users' behaviour.

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[15]Education Management Information Exchange Project, SEE Streatfield, 1983.

[16]Based on Patton (1980).

Does the change of paradigm mean, then, a radical dismissal of library and information services, as Brittain (1982) remarked? Not necessarily; library and information services, inspired by the positivist conception of reality, can be improved, like any other human construct. Nothing prevents information specialists from developing new services that take into consideration the results of naturalistic enquiries about information-seeking and as Wilson (1981b) points out, user studies have a place both in applied research, where they are linked to system design and evaluation, and in basic research, where their objective is the understanding of user's behaviour in itself.

Wilson (1990) has reviewed the latest research on user studies carried out at the Department of Information Studies (Sheffield University); research done by Ellis, Vedi and Brown has a common characteristic, i.e. a preference for qualitative interpretations which are based on a *'grounded theory'* approach. *'Grounded theory'* – I will discuss this approach later in the study – is a style of qualitative analysis that aims at generating and testing theory (Strauss, 1987); in this sense the works just mentioned are examples of basic user studies that have adopted a holistic-inductive paradigm.

On the other hand, the services developed by David Streatfield and his team while working for the National Foundation for Educational Research are a good example of how a new research paradigm that puts users first and it is concerned with gathering empirical data about people's information-seeking behaviour can be effectively used to generate a new model of library and information services. The starting point of Streatfield's team was to accept the patterns of information-seeking actually followed by their clients; the next step was to create information services tailored made to these patterns. Training workshops were the main way of both exploring information-seeking patterns and generating information services. The users described their information-seeking activities and their problems; the librarians offered their expertise and proposed solutions. The most important outcome of the workshops was that the information services, eventually implemented, were the result of an active partnership between librarians and users:

> *'Our work has shown that it is possible to redefine the librarian-user relationship in a more productive way by accepting that we have built up substantial expertise in obtaining, sorting, storing and using information which may be of use to people in a variety of work or leisure settings if the people in those settings can be encouraged to share their aspirations, concerns and difficulties. This may in turn lead to the adoption or adaptation of information systems and services to make them really appropriate for use in these settings. In other words, we are helping our clients to create effective information management strategies and to use our services as part of these strategies if they are appropriate' (Streatfield & Gee, 1990 p.284).*

Such a partnership as the one described above has far reaching consequences for the future role of librarians, but at a purely methodological level the work by Streatfield and his team proves that a new research paradigm based on qualitative methods can be successfully used in applied user studies (Markless & Streatfield, 1989; Streatfield & Gee, 1990; Streatfield & Rodwell, 1990).

2.4 Conclusion

After forty years of research, how can we sum up the state of art of user studies?

User studies have extended their scope from the scientists to the citizens; from specific library and information services to organizations, professions or even communities.

The basic techniques of social research: observation, interviewing, questionnaires and diaries; self-produced data and secondary data, applying a quantitative or qualitative approach for a basic or an applied study, are the methodological options available. If they are applied precisely, in rigorous research designs, which are adequately formulated to the purpose of each particular project, then they are powerful tools to help the advancement of user studies.

The hypothetico-deductive paradigm has provided the bulk of results, that describe different aspects of users' information-seeking behaviour.

The holistic-inductive paradigm can advance our understanding of the information-seeking behaviour of users, allowing us to break away from our traditional professional assumptions about users and the provision of library and information services.

The next two chapters will look into how these two paradigms have developed in the health care field, with particular reference to Dentistry.

Chapter 3

User Studies in Health Care

A constant concern of the research in this field has been to assess how medical practitioners use information to improve the performance of their two key clinical tasks: diagnosis and treatment. As a consequence user studies have been biased towards a particular group of users: the physicians, and how they satisfy their information needs arisen from their clinical tasks.

Contributions have been made by the health professions themselves, for example studies carried out by medical associations; or by the library and information professions, for example studies carried out by medical librarians. The very nature of the contributors has brought an extra bias to the studies. While the first group has looked into the use of information regarding the issue of continuing medical education, the second group has examined the use of library services and library-related information sources.

Finally, another consideration to bear in mind is the national differences in the health care systems. The categories of users of information in health care are determined by the overall structure of the health system in each country, not only in terms of professions and occupations but also in terms of specific work roles. Because of this, the rest of this chapter will deal, exclusively and selectively, with user studies carried out in the USA and the United Kingdom from the 1950's to the present.

3.1 The American contribution

The hypothetico-deductive paradigm inspired the user studies carried out in the USA from the 1950's to the 1970's. As in the case of user studies in general, these studies provided most of the information that has accumulated, so far, about the information-seeking behaviour of health practitioners, however fragmentary or incomplete that information might be.

Sherrington (1965) reviewed the user studies done between the end of the World War 2 and the mid 60's[1]. These studies were carried out by professional associations, drug companies or individuals from the health professions. The users –in most cases– were general medical practitioners randomly selected within a state, or a region or across the whole USA. The studies were source-orientated. The flow of information was considered from the point of view of certain information sources and channels of

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[1]Since 116 out 120 studies were done in the USA, it is mainly a bibliography of American research on the subject

communication selected *a priori*. Sherrington (1965) identified 11 channels of communication: *postgraduate courses, conferences and meetings, exhibits, colleagues, motion pictures, sound recordings, radio, television, journals, direct mail, detailing* [2]; five dimensions: *needs, availability, exposure, recall and action*; and six methods of data collection: *questionnaires, interviews, telephone surveys, review of records, diaries, observation and testing*.

As a result of this classification, his bibliography showed that: i) the focus of research had been centred upon the use[3] of postgraduate courses and journals; ii) the data collection had relied on questionnaires, closely followed by interviews.

If we examine the contributions made by the library and information professions, the application of the traditional paradigm had for the design of user studies in health care similar consequences to those experienced by user studies in other fields during the same period. The studies were predominantly system-oriented. The system was usually the academic health library or more precisely some aspect of it, such as: space allocations within the library (Pings & Anderson, 1965); use of library books (Raisig et al., 1966); use of journal articles (Pao, 1975; Wender, 1975); evaluation of the clinical medical librarian programme (Schnall & Wilson, 1976); analysis of literature searches (Wender et al., 1977); or analysis of Medline search requests (Greenberg, Breedlove & Berger, 1977). Both information sources and users were perceived in terms of that particular system. Therefore they looked into those information needs that were satisfied by means of printed sources obtained from the library system. Their target users were the intended users of the academic health library, namely the members of the medical and dental faculties at the university. As to the methodology, the studies were descriptive, gathered data by means of mailed questionnaires, analysis of documentary sources, structured interview or observation, and used quantitative analysis to present the results.

They were applied studies whose aim was to improve a particular library service. They did not attempt to study the use of library and information services or the use of printed literature as a whole, even less to explain the information-seeking behaviour of health practitioners. However, some of the conclusions suggested certain characteristics of that behaviour:

- books from the library were used mainly for research purposes (Raisig et al., 1966);

- Medline searches were requested mainly for research purposes (Greenberg, Breedlove & Berger, 1977);

- difference between the information needs of general medical practitioners and fourth year medical students (Wender et al., 1977).

These conclusions showed the relative value of printed literature as an information source and even more importantly they suggested possible differences between the patterns of information-seeking within each particular group of health practitioners.

An attempt to study the information-seeking behaviour in general was the project carried out by Herner (1958). It was limited to medical researchers, but it covered all sorts of information sources and channels of communication. The results were

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[2]The interaction medical practitioner-sales representative

[3]The *'exposure'* dimension in Sherrington's classification.

analysed in a straightforward quantitative way, ranking the frequency of use of the identified information sources in various situations: *finding information in general, solving problems, getting ideas for new research projects; becoming aware of information sources, carrying out literature searches*. These results did not provide a model of information-seeking behaviour, but they described some characteristics of that behaviour: i) regular scanning of journals, attendance at meetings, lectures or conferences, and discussions with colleagues appeared as the most frequently used methods of gathering information; ii) printed literature obtained as a result of a formal bibliographic search was an important source for academic related activities, but not for clinical tasks; iii) discussions with colleagues emerged as the key information source for most situations.

Another attempt to study the overall information-seeking behaviour of health practitioners was reported by Herner & Herner (1967). It was a study of medical researchers by Werner, applying the telephone-recording technique combined with self-administered activity cards. Both the population of users (only four scientists participated) and the technique (it is difficult to obtain accurate and reliable data from user-administered records and to assess the impact that the data collection in itself has on the described behaviour) rendered the study rather unsuccessful[4].

Other studies explored the information needs of physicians with regards to continuing medical education (CME), for example the surveys of the Texas Academy of Family Practitioners (TAFP). They gathered data about the perceived continuing education needs of the physicians attending the TAFP meetings over a period of three years. The aim of the surveys was to match these needs with the continuing education programme of the TAFP (Brandt, 1975).

Other users of information in health care were considered, as well. Crawford (1978) reported user studies on patients information, early childhood development and rehabilitation.

The feasibility study for a national rehabilitation information centre (Matheson et al., 1975) looked at the information needs of all those working in that speciality: administrators, practitioners, researchers, handicapped individuals and general public. This project, which was a major departure from the traditional approach, focused on the information needs of medical practitioners both for user studies and system design.

But on the whole, user studies remained centred upon the relationship: medical practitioner-medical library. As Crawford (1978) concluded:

> '*Again, most of the use studies in this area were fact-finding and designed
> to solve specific problems*' (*Crawford, 1978 p.66*).

As we have seen in the previous chapter, dissatisfaction with the advances in user studies led, in the 1980's, to a reformulation of the conceptual approach. New theories of information and communication legitimated alternative models of research, that opened new directions in the study of information-seeking behaviour. One of these new directions unfolded in the field of health care, more specifically in the field of patients' information-seeking behaviour.

Dervin and her research team developed a qualitative methodology to study the communication patterns of patients in different health settings. The first stage was to propose an alternative paradigm based on a set of assumptions about the communication process that challenged the traditional ones. They set to work on the

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[4]See Herner & Herner, 1967 p.5-6.

assumptions that: i) information was relative; ii) the communication process was a receiver construction; iii) the use of information should be understood from the user point of view; and iv) that use was eventually shaped by the user in terms of his/her own perceived needs. The second stage was to apply situational theory to study the patients visits to the doctor (Dervin et al., 1980).

They did not advocate a purely qualitative approach. Their aim was to achieve a better understanding of patients'patterns of communication in order to predict their information-seeking, i.e. what kind of questions the doctor can expect in each different situation. The prediction of patient behaviour required measures of information-seeking. They derived these measures from content analysis of in-depth interviews and tested the predictive power of *a priori* situational measures (e.g.: number of times the patient had donated blood) against time-space bound situational measures (e.g.: importance of the event for the blood donor) in a study of blood donors and how they perceived that experience (Dervin, Nilan & Jacobson, 1981).

The value of their methodology resided in an alternative model of the communication process that helped to change the orientation of user studies from quantitative to qualitative designs. The strength of their methodology rested on the innovative interpretation of information use in terms of situations in which the user made sense of reality by bridging gaps in his/her construction of that reality. The weak point of their methodology was inevitably linked to the criteria used in defining qualitative measures, especially because their ultimate purpose was to test the predictive value of these measures by means of statistical analysis[5].

3.2 The British contribution

The organization of health care services based on a single national system: the National Health Service (NHS) has provided a totally different framework for the development of user studies in the United Kingdom. The existence of a health system that covers all sorts of health services for the whole country and encompasses all health professions has undoubtedly helped in the realization that the flow of information in health care is a complex process, where different categories of users —requiring different levels of information, that is obtained from a wide variety of sources— interact in multiple ways. As a consequence research has been based on comprehensive guidelines that, at least in theory, take into account the problem of user studies in its entirety.

This comprehensive approach has not been enough to rescue user studies from the methodological shortcomings of their American counterparts or those of the user studies in general, but it has opened various avenues of research that can eventually render a better understanding of the information-seeking behaviour of health professionals.

Along with innumerable case studies, we find several projects at regional and national level, such as the Wessex Research Project (Tabor, 1973), the British Library project on the use of medical literature (Ford, Maguire & Walker, 1980) and the report of the Medical Information Review Panel (1981).

The Wessex Research Project (Tabor, 1973) set out to explore the use of information throughout the NHS. Its five objectives covered the five basic issues that user studies in health care should address: categories of users, levels of information, purposes for seeking information, patterns of communication and information sources.

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[5]A detailed discussion is in Dervin, Jacobson & Nilan, 1982.

They reflected the basic assumption that:

> '...the users of information in the NHS exemplified a complex of subject
> interests and purposes for which information is required and methods by
> which information is communicated' (Tabor, 1973 p.3 .

This comprehensive definition of a user study presented several practical problems
to a project team that had to work under severe time constraints. However, this lim-
itation forced them to depart from the traditional model of quantitative user study
and to abandon any statistical analysis of the results. Instead, they chose unstruc-
tured interview to collect data on each of the main issues and made a qualitative
interpretation of the results. Besides the formulation of several recommendations for
the development of information services, this interpretation provided a general outline
for further research. Briefly, this outline suggested the need to consider:

- categories of users defined by kind of activity, rather than by profession or
  technical speciality;

- levels of information according with the individual's degree of specialization and
  the individual's hierarchical position in the system;

- education (induction training, basic education and continuing education) and
  decision-making (clinical and non-clinical) as the main reasons for seeking in-
  formation;

- patterns of communication regarding hierarchical and lateral flow of information,
  pointing out the following possible obstacles: geographical isolation of some
  practitioners, lack of time to look for information, rate of change, scattering of
  information and foreign language barrier;

- information resources by special subject fields, by origin and by type of material.

This conception of a user study influenced subsequent research in the field, for
example the British Library's project on the use of medical literature. The research
(Ford, Maguire & Walker, 1980) was focused on the use of printed literature via
library services. They pursued three lines of investigation: i) information needs;
ii) use of inter-library loans and iii) use of libraries, applying a survey approach.
Again resources and time were serious constraints that limited the actual scope of
the project. For example, they could not investigate every category of user in the
NHS and therefore they selected some of them: general medical practitioners, general
dental practitioners, hospital medical staff, hospital dental staff, hospital biochemists
and physiotherapists. In addition, the population of each survey was not always a
random sample of the actual group of users. Since the project was interested only in
the use of literature, the outcome was data about this particular information source,
touching only one aspect of the information-seeking behaviour of health practitioners.
However. each survey of user information needs has become a valuable antecedent for
further research into the information-seeking behaviour of each group of users, as we
shall see in the next chapter, where the two surveys on dentists information needs are
discussed.

The Medical Information Review Panel (1981) prepared a review on the use of
information in Medicine. In this case although the emphasis was on the use of lit-
erature and library services, they considered other aspects of the use of information

such as drug information services, continuing medical education and on-line services, but they referred exclusively to medical doctors. The main value of this review was to provide the British Library with the basis for a programme of research in medical information.

The information needs of two categories of users were investigated as a result of this programme: occupational health professionals (Wood, Rubin & Thomas, 1984) and community medicine doctors (Hawkins, 1986). The first project was innovative in its research design because the population of users was not limited to the physicians and the method of data collection was not self-administered questionnaire. The investigators (Wood, Rubin & Thomas, 1984) looked into the use of information in the whole field of occupational health, and as a consequence they designed a sample of several categories of users, each one representing the main professions involved: occupational health practitioners, nurses and hygienists, safety officers, workers engaged in research and advice, and general practitioners. The other change in the design was to investigate both the users and the information sources. Their method of data collection about the users was structured interview, combining open and closed questions. The basic structure of the interview schedule was adapted to the particular environment of each category of user, but it always covered the same aspects: data about the interviewee's organization, job descriptions, use of information sources (a range of them from literature and libraries to audiovisual materials and professional associations) and information needs. In order to study the information sources they proceeded i) to identify them; ii) to interview the organizations involved in the provision of occupational health information; iii) to perform factual and bibliographic on-line searches on topics suggested by the interviewees and to assess the suitability of on-line data bases for this particular field.

Despite these innovative features, the research design was still influenced by the traditional paradigm of user studies; for example, the tasks and information needs of each group of users were categorized *a priori*, instead of being derived from the users' replies. But the interview schedule enabled them to collect a rich set of data – richer than any self-administered questionnaire could possibly be – to shift from a quantitative analysis to a qualitative interpretation. The experiment with the literature searches showed the value of this line of enquiry, if we want to assess the performance of data-bases from the point of view of the end user, rather than from the point of view of the indexing language. The change in the tools of data collection improved the quality of the data eventually obtained; but this change alone, without a parallel change in the theoretical approach was not enough to actually shift from one paradigm to another. The traditional approach to user studies pervaded the final analysis of results. They advanced in the description of information-seeking behaviour, because of the ways in which they collected data, i.e. several categories of users in a same field using personal interviews; but these descriptions were not integrated in a general model of this behaviour.

The second project was a national survey of NHS physicians and academics in Community Medicine carried out in 1984 (Hawkins, 1986). The data collection was done by means of a postal questionnaire (with a high response rate: 75%), complemented with interviews. However, the published results referred only to a descriptive statistical analysis of the replies to the questionnaire. Despite this limitation, the principal findings indicated certain characteristics of the information-seeking behaviour of community medicine doctors: reliance on face-to-face communication and document-

based information not necessary obtained through the library system[6].

Although the bulk of user studies has been on *the* one category of users – the medical doctors – another characteristic of the research in the U.K. has been a constant awareness that users of information in health care are not only medical doctors but also other health professionals, health managers and patients. The need to look into the information requirements of other health professionals has repeatedly appeared in recommendations for further research (Medical Information Review Panel, 1981; Wilkin, 1981a).

I have already mentioned two studies focused on categories of users by speciality: community medicine and occupational health. There has been a sustained interest regarding patients information needs and the provision of health information services for the general public. This review does not consider these studies, since the actual research is concerned exclusively with the information-seeking behaviour of dental professionals and does not include dentist-patient interaction, nor patient's needs about dental information[7].

Drug information needs have also been investigated. Leach (1978) assessed the role of the Regional Drug Information Services in a study that analysed the inquiries received during a one year period. Hibberd and Meadows (1980) described the information-seeking behaviour of hospital doctors linked to the prescription of new drugs as a three stages process: i) awareness as a consequence of information provided by the pharmaceutical industry; ii) evaluation based on the reading of scientific journals and colleagues' opinions; iii) routine prescription checked in drug formularies; the strategies vary with the specific reason for seeking information, and they basically rely on printed literature or face-to-face communication.

The use of library and information services has dominated most of the research, but because special libraries in health care are either within the NHS or related to it, medical and health librarians have been conscious of the need to reach all categories of users in the system. Attempts to reach the non-users of library services, such as the general practitioners, have led to both general recommendations for action, e.g. the Medical Information Review Panel (1981) recommended to establish more direct links between practitioners and local medical librarians[8] and specific projects, e.g. the general practitioner information project (Carmel & Childs, 1980). The Joint Working Party on Library Services, set up by the National Health Service Regional Librarians Group in co-operation with the Department of Health (formerly DHSS), organized a series of workshops on the information needs of various health professionals: *hospital doctors, nurses, paramedical professions and primary health care staff.* These workshops aimed at encouraging each of these groups of users to express their views regarding their information needs. They were not, strictly speaking, user studies but nonetheless it was a way of receiving feedback from the users, an attempt to understand both those who were users, and those who chose not to be (Carmel, 1986).

Finally the provision of information services at management level of the NHS has opened another specific line of research: the study of the information needs related

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[6]See Hawkins (1986), p.155.

[7]The state of health information services has been reviewed by Kempson (1984). More recent studies like Hallas (1987) explored the information needs of physically disabled young people and Davy(1990) reviewed the information needs of patients in general with particular reference to cancer patients, in her study of the provision of information to cancer patients and their families.

[8]Op.cit., p.15

to management information. The Cambridgeshire Area Information Service Research Project stands as a key study in this particular aspect of health care information, because of its definition of management information, the methodology and its final recommendations. Smith (1982) designed the study to enquire into the overall information needs of health care staff involved in planning and management of health services at area/district level and the ways of meeting those needs. She observed that management information was considered in purely statistical terms, when in fact health planners and managers required non-statistical information as well:

> *'The National Health Service has historically considered information for planning and management to be solely statistical information' (Smith, 1982 p.10).*

and later on she added:

> *'There still appears to have been a failure to appreciate the value to management of non-statistical information, neither has there been any serious attempt to consider an information system which is completely integrated, that is, one that provides as far as possible all the information needed to meet management's requirements, not just statistical information' (Smith, 1982 p.10).*

The research design, based on this broad conception of management information, was modelled in the style of action research developed by Project INISS[9], integrating different methods of data collection. It covered: i) an exploratory study of the information needs within the health area authority (mailed questionnaire); ii) monitoring the existing information service (analysis of requests, complemented with interviews; users' assessment of the information provided as a result of a request); iii) establishing experimental services: trial press-cutting service and specialist information service for a planning team; iv) evaluation of the experimental services (mailed questionnaire; analysis of activities by means of observation; analysis of documentary sources, team questionnaire); v) final recommendations, both at general level related to guidelines for integrated information services and at local level related to the particular health area under study.

Despite the contribution of this study, enhanced by a sound methodological design, its main recommendation:

> *'That each district health authority adopt an integrated approach to information for planning and management of the NHS, combining systems for local data collection (for Hospital Activity Analysis, DHSS, etc), current awareness services and appropriate literature collections, patient information, health education, financial and manpower information, and press and publicity roles' (Smith, 1982 p.38).*

has still a long way to go.

The perception of management information at government level has not changed a great deal since Smith's initial observation. The Government's White Paper on the NHS[10], that outlines the current radical reform of the NHS, refers to 'information' in these terms:

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[9]See page 12.

[10]WORKING for patients.- London: HMSO, January 1989.

> 'The Government recognises that managers and professional staff need bet-
> ter information if they are to make the best use of the resources that are
> available to them. The NHS has made considerable progress in developing
> better information systems in hospitals, but there remain some important
> limitations. In particular, there is at present only a limited capacity to
> link information about the diagnosis of patients and the cost of treatment'
> (WORKING for patients, 1989 p.16).

Information is recognized as a managing resource that needs to be improved, and in the Government's opinion the full development of the Resource Management Initiative (RMI) will bring about that improvement. The White Paper is a step forward in recognizing the patients' rights to information as part of their consumers' rights; information about facilities, hospital organization, use of hospital services, medical condition affecting the patient, diagnosis and recommended treatment is regarded as a basic service that every hospital should provide[11]. But apart from that exception, information is consistently mentioned throughout the White Paper in the context of budgeting services and monitoring their cost-effectiveness[12].

The White Paper not only fails to mention library and information services in the NHS[13], it also fails to understand the complexity of the information needs of NHS staff. Both the White Paper and *Framework for information systems* [14] understand information needs in statistical and financial terms and do not realize that patient's management requires access to clinical information and literature collections as well. Although the present study does not look into the information needs of health managers, I will come back to the issue of management information when I analyse how it is perceived by dental professionals.

3.3 Conclusion

Wilkin (1981b) described library and information research in health care as: i) focused on user needs and evaluation of experimental services; ii) targeted at medical doctors, while other categories of users had been neglected; iii) dependent on questionnaires for data collection.

Has that situation changed and to what extent has it changed?

In the early 80's, user studies in health care started to consider new approaches. The work of Dervin and her team[15] has probably been the most important contribution from America, because not only did they apply a new technique but they critically revised the whole set of assumptions that had been the basis for user studies until then.

The hypothetico-deductive paradigm has not been abandoned altogether; its success in health care, as in any other field, depends on the purpose of the research. Ludwig, Mixter and Emanuele (1988) have applied it satisfactorily to monitor end-user searching at a medical academic library. Similarly, Skinner and Miller (1989) have carried out a descriptive study of the use of journals by registered nurses.

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[11]See op.cit. p.7;75 and 89.

[12]See op.cit. p.8;53;55;77 and 96.

[13]See comments by Willis (1989).

[14]FRAMEWORK for information systems: overview.- London: HMSO, 1990.-

[15]See page 18.

The two main lines of enquiry in health care: the role of continuing medical education and the role of library and information services seem to have become closer, in later studies. Manning (1990), Leist and Kristofco (1990) and Messerle (1990) looked at both issues and all of them have agreed on the importance of health libraries for formal and informal continuing medical education.

In his review of the information-seeking behaviour of physicians, Gruppen (1990) insisted on the same idea and recommended the study of informal continuing education processes to re-assess the role of health libraries. At the same time he has pointed out the need to extend this study to other health professions and reminded us that libraries and on-line databases are still perceived as a 'threatening environment' by general practitioners. The answers to these issues can be discovered by a market research approach in the way of small-scale studies targeted at specific groups of users of particular health libraries.

Despite attempts at enquiry about the information-seeking behaviour of health professionals, other than medical doctors and to experiment with new techniques, health care user studies, in America, are still strongly system-oriented and ultimately concerned with predicting user seeking-behaviour.

In the U.K., the holistic approach to user studies outlined by the Wessex Research Project[16] has encountered several difficulties at practical and theoretical levels.

At the practical level, time and financial constraints narrowed the scope of research drastically and eventually stopped it. That has been the case with, for example, the Wessex Research Project (Tabor, 1973), the British Library project on the use of medical literature (Ford, Maguire & Walker, 1980) and the projects on occupational health (Wood, Rubin & Thomas, 1984) and community medicine (Hawkins, 1986). Another common difficulty, experienced by these projects, was to find adequate framelists. Because of that, the complete universe of users was not always identified and true random samples were not possible. Also in some cases access to users was not feasible, for example, the project on information for occupational health could not obtain the cooperation of the Health & Safety Executive (Wood, Rubin & Thomas, 1984).

At the theoretical level, the main progress has occurred regarding the techniques of data collection. Interviews on their own or complemented by other methods are now commonly used. The combination of several techniques to gather data on different aspects and to validate results has also been tried. In both cases, the techniques have provided a richer insight into users' behaviour, but as I have already expressed, an improvement in data collection is not enough[17]. The holistic-inductive paradigm requires, as well as new ways of gathering data, new ways of analysing and interpretating the results.

An important contribution in that respect has been the study of medical practitioners' information needs by Brember (1982)[18]. She applied a combination of semi-structured interviews, questionnaires, feedback forms, direct observation, reference tracing, and analysis of library records to study different aspects of the use of libraries by medical staff in the teaching hospitals and departments of Oxford University. It was basically a quantitative survey, but apart from a statistical description, she made a qualitative interpretation of the results. That interpretation identified

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[16]See page 19.

[17]See page 21.

[18]A progress report of the research appeared in Brember & Leggate (1982) and the summary of the whole study appeared in Brember & Leggate (1985) and Brember (1985).

three types of users, each with a distinctive information-seeking behaviour: *the practitioner*, who seeks as much information as it is necessary to deal with a clinical situation; *the researcher*, who seeks as much information on his/her research topic as it is possible; and *the practitioner-researcher*, who varies his/her information-seeking behaviour according with the situation, i.e. *the practitioner-researcher* gathers information selectively for clinical problems and extensively for research topics. The work environment appeared as the decisive factor in shaping the seeking behaviour of the users. Nevertheless, the users –regardless their type– seemed to use library-related information sources all the time; but the study was focused on library use and therefore it gathered data on the use of that particular source only (Brember & Leggate, 1985). Brember carried on the analysis, applying Checkland's soft systems methodology. In the author's own words:

> *'The application of Checkland's methodology to the Oxford medical libraries revealed the value of combining information about the user population, their information needs and ways of meeting these needs into a formal statement of library function' (Brember, 1985 p.73).*

The main objective was not just to understand the information-seeking behaviour of medical practitioners but to apply this understanding to the management of library services. In that sense, despite the qualitative interpretation the study remained system-oriented; the information-seeking behaviour of medical practitioners was considered in terms of library services usage.

Since Wilkin's comments[19] research has progressed exploring several categories of users in health care, trying a variety of data collection techniques and looking at the problem of information needs from the point of view of practitioners, health managers and patients. However, there are still some unexplored areas, such as certain categories of users, the overall information-seeking behaviour of particular users and models of that behaviour applying grounded theory (Ellis, 1987). One of those categories of users is the dental professionals, and the next chapter discusses the development of user studies in Dentistry.

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[19]See page 24.

Chapter 4

User Studies in Dentistry

4.1 Description of the studies

There have been user studies on a few different aspects of the information-seeking behaviour of dental professionals. These aspects are: information needs in general, drug information, adoption of innovations and use of library services. Unlike user studies in health care, it is not possible to distinguish different trends between the research done in USA and that done in the U.K. Contributions from both countries have explored similar issues. Moreover, since all these studies follow the hypothetico-deductive model, they have shared the same approach. This section describes these studies in detail, while section 2 discusses their contributions and limitations.

4.1.1 The Pilot Surveys of the Information Needs of Dental Practitioners by Patricia Walker

Patricia Walker carried out two pilot surveys as part of the British Library research project on the provision and use of the medical literature[1]. The main purpose of these surveys was to obtain a profile of the *'information requirements'* of dental professionals in the U.K. A self-administered questionnaire, sent out by post, was the method of data collection. Dental practitioners were divided into two different groups: i) general dental practitioners and community service dentists (Survey No.1 hereinafter); ii) hospital dentists including both hospital and academic staff (Survey No.2 hereinafter). Two slightly different questionnaires were prepared for each of these groups.

Both surveys attempted to cover the population of dentists at national level but time constraints, prevented the researcher from obtaining a representative random sample of the two groups covering England, Wales and Scotland. Instead, she selected 140 dentists for Survey No.1, less than one percent of the population[2], and 100 dentists for Survey No.2, nine percent of the population[3]. The source for these samples was the 1977 Dentists Register and dentists were selected because their addresses indicated either a general dental practice, a community health service or a hospital unit. As

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[1] A full description of the research project appears in Ford, Maguire & Walker, 1980, p.ix.

[2] In 1977 there were 13,564 general dental practitioners and 1,901 community service dentists in U.K.

[3] In 1977 there were 1,118 hospital dentists in U.K. Figures in both cases are from: Great Britain. Department of Health and Social Security. *Health and personal social services statistics for England: (with summary tables for Great Britain).-* London: HMSO, 1978, p.28-9

the studies acknowledged, none of these samples were representative of any group of dental practitioners included. The response rate was 56% for Survey No.1 and 64% for Survey No.2.

In Survey No.1 statistical analysis was limited to calculation of the frequency scores for each question. The small size and the consequent unrepresentative nature of the sample did not allow further analysis.

In Survey No.2, the statistical analysis was slightly more detailed. SPSS (Statistical Package for the Social Sciences) was used to process data. Besides simple frequency scores for each question, chi-squared tests were applied to analyse: i) differences of responses between different specialities; ii) differences of responses against professional age; iii) differences of responses against job status.

The conclusions, although tentative, offered the first profiles of dental practitioners' information-seeking behaviour, ever attempted.

Survey No.1 describes general dental practitioners and community service dentists in these terms:

> *'Virtually all dentists working in general dental practice and some of the dentists working in the community health service have a purely practical work role and therefore information is needed mainly for keeping up to date and for helping them deal with clinical problems' (Walker, 1976 p.5).*

The time dependence regarding information needs was low. The success rate in terms of how frequently they met their information needs was high. A low use of libraries appeared along with low use of reference sources. A high proportion of the respondents, 85%, considered that they were reasonably successful in keeping up to date with new developments in their field. Their most important source of information was journals and they were obtained mainly by personal subscription.

Survey No.2 describes the hospitals dentists as follows:

> *'In general, hospital dentists carry out the work roles of teacher, researcher and clinician. The majority of respondents...needed information for teaching, research work, dealing with clinical problems, the preparation of papers, talks, etc. and generally keeping up to date' (Walker, 1978 p.19).*

They needed information more urgently than the other group. Their success rate was moderate. While the use of libraries was significantly high, sources of references were seldom used.

As with their colleagues in general dental practice they preferred journals as their main information source, and again there was a high rate of personal subscription. Attendance at meetings was another information source regularly used. Also, hospital dentists considered that they were reasonably successful in keeping up to date with new developments.

Finally most of them identified lack of time as their main obstacle to obtain information.

4.1.2   The Use of Drug Information by Dental Practitioners

The study of dentists' preferred sources of information on drugs by Murray

As part of his doctoral research[4], Murray replicated an earlier study conducted on physicians by Linn and Davis[5]. He published the results of this study in a separate paper (Murray, 1981) which is the one discussed here.

Murray tested the same hypotheses as Linn and Davis:

- *'Dentists preferring professional sources of information will be <u>less</u> likely to feel that medication advice from nondental sources is acceptable than dentists preferring commercial sources'*

- *'Dentists preferring professional sources of information will be <u>more</u> likely to express conservative attitudes about what constitutes legitimate use of drugs by patients than dentists preferring commercial sources' (Murray, 1981 p.782).*

He used a combination of interview and self-administered questionnaire. A stratified random sample of 130 dentists constituted the survey population. These dentists were drawn from a 13-county area in a Southeastern state of the USA.

The response rate of the interviews was 72% but it went down to 60% when only 78 of the 92 interviewees returned the questionnaire.

No statistical evidence was found to support any of the two hypotheses above mentioned.

The results showed that the preferred sources of drug information were in descending order of importance:

- Medical reference books (Physician's Desk Reference)

- Recommendation by colleagues

- Dental reference books (such as Accepted Dental Therapeutics)

It indicated a pattern of behaviour significantly different from that of physicians. The latter according with the previous study by Linn and Davis, preferred in descending order of importance:

- the detailmen (trade representative)

- other physicians

- advertising in medical journals

This study is the only one that has attempted a comparison -in this case a very strict one- between dentists and medical doctors. All the others although wider in focus, do not explore the interaction of the dental professionals with health care in general.

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[4]Murray, B.P. (1979) An exploratory study of the prescribing patterns of dentists. University of Kentucky

[5]Linn, L.S. & Davis, M.S. (1972) Physicians'orientation toward the legitimacy of drug use and their preferred source of new drug information *Social Science & Medicine* 6 199-203.

Survey of the dental enquiries received by the Regional Drug Information Units of the NHS (U.K.), by A.J. Duxbury and F.N. Leach

Duxbury & Leach (1981) in this survey explored the extent to which dental practitioners used the Regional Drug Information Service to satisfy their drug information needs.

They collected data in three main ways:

1. Retrospective analysis of enquiries at the North Western Regional Drug Information Unit for the period 1978/1979;

2. Questionnaire sent to the other regional units collecting similar data as above but for the period 1978;

3. Enquiries dealt by the Department of Oral Medicine at the University Dental Hospital of Manchester for the period 19/9/79 to 12/12/79.

Only 6 out of the total of 18 regional units were able to provide the information required by the questionnaire. All the other units were unable to help because they could not identify enquiries made by dental practitioners from their records. Since dentists used the services very infrequently their enquiries were not identified as a special category.

The main conclusion of this survey was *'that dental practitioners still infrequently make use of regional drug information units' (Duxbury & Leach, 1981 p.107)*.

The reasons for this attitude may be either that they are not aware of the service or they need this sort of service far less frequently than do other health professionals, probably because they use fewer drugs and do so less frequently than medical practitioners.

However another possible reason might be that the dental hospital is preferred as source of drug information to the regional drug information units.

4.1.3 Information Sources and Adoption of Innovations

The adoption of innovations in general dental practice: the study by Sarll and Holloway

Sarll and Holloway (1982) carried out a study of the factors affecting the adoption of innovations by general dental practitioners, which seems to be the only one of its kind carried out in Dentistry, to date.

It was not strictly speaking a user study from the point of view of Library and Information Science. However the results showed tendencies in the use of different information sources, as we shall see later on, mainly because the measure of vocational social interaction was obtained by counting the instances that both formal and informal, written and oral information sources were used.

Their principal hypothesis was that adoption of innovations would depend on three main factors:

- practice's resources;

- vocational social interaction;

- degree of specialization.

Four different sets of measures were devised to test that hypothesis:

1. measure of innovation: number of innovations adopted from a set of pre-defined seventeen innovations;

2. measures of the practice resources:

   - size of the practice (in terms of dentists working together);

   - wealth of skills (in terms of division of labour within the practice).

3. measures of vocational social interaction by counting:

   - number of journals read;

   - attendance at up-dating courses;

   - formal and informal interaction with colleagues (number of meetings);

   - interaction with dental trade representatives (number of contacts).

4. measures of degree of specialization:

   - part-time employment in dental hospital/school or any other branch of the dental services;

   - specialization of the respondent's own practice.

The population was defined in terms of all general dental practitioners who were working in Greater Manchester and who had made their first entry in the Dentists Register during the period: January 1st, 1955 to December 31st, 1964. This time limit was introduced in order to select dentists neither too recently graduated nor too experienced, because they assumed that neither young graduates nor dentists approaching retirement were likely to feel a great urgency on keeping up to date with changes. This population amounted to 148 dental practitioners.

A two stages survey was carried out during 1979. The first stage was to send a self-administered questionnaire by post. The questionnaire covered four sections: 1) practice's resources; 2) preferred information sources for keeping up to date; 3) number of innovations adopted; 4) reasons for adoption/non-adoption of innovations.

At a second stage, they had personal interviews with the respondents, at their practices in order to: i) validate the replies by direct observation; ii) assess the degree of adoption of each innovation; iii) discuss their reasons for adoption/non-adoption.

The response rate of the questionnaire was particularly high: 74% going down only to 72% for the actual analysis.

The results proved that the practice's resources correlated with adoption of innovation, with a stronger direct relationship in the case of wealth of skills.

The number of journals, obtained by subscription, membership to professional associations and attendance at scientific meetings, were all directly related to adoption of innovations. But adoption of innovations did not correlate with attendance at up-dating courses or informal interaction with colleagues, and nothing is said about interaction with dental trade representatives. The degree of specialization achieved by the respondents had also a positive relationship with innovation scores.

The authors pointed out that when these factors: practice's resources, vocational social interaction and degree of specialization, were analysed together, they possessed a common element: **the amount of information that the dental practitioner was able to control.** Therefore their final recommendation has been a reformulation of their original hypothesis in the following terms:

> '...a major hypothesis suggested for further investigation is that dental practitioners'success in keeping up to date is influenced by the volume of information they acquire from all sources in the health care system' (Sarll & Holloway, 1982 p.266).

The adoption of a single innovation: survey by Landesman et al.

This was a very restricted study of adoption of innovations in comparison with the previous one. It was concerned with:

1. the adoption of a single innovation:. use of resin-bonded prothesis, also known as Maryland bridge;

2. the importance of continuing dental education as information source for adoption of innovations

It was the survey with the largest sample: 2401 general dentists from Southern California and Pennsylvania, but the response rate was only 52.3%.

They designed a self-administered questionnaire, very brief: 10 questions only, and it was sent by post.

They investigated whether continuing dental education was the first source of information on the Maryland bridge, the first source of learning about it and the first source for further training in that technique.

The results indicated that continuing dental education was only the most important source for first learning about the technique of the Maryland bridge. But it was not the first source of information about this particular innovation. This place was largely held by journals, while continuing dental education came third after colleagues. The main source for further training was again journals and continuing dental education appeared in second place with a very small advantage over colleagues (Landesman et al., 1986).

4.1.4 The Library Services Provided to Dental Practitioners by Dental School Libraries in the U.S.A.

Ashin (1983) examined both the services offered by dental school libraries and the use that dentists do of these services.

A self-administered questionnaire was sent to the 60 Dental School Libraries of the U.S.A. These 60 schools were spread over 33 states, leaving only 17 states without a dental school and associated dental library.

The response rate was remarkably high: 88%.

The main conclusions of the study were:

- The policies of dental school libraries regarding the provision of services to dental practitioners were far from consistent. There were 6 libraries that provided

services to ALL dentists; 89% of the respondents indicated that their libraries were opened to their alumni for at least one of the services identified by the survey;

- The librarians' perception was that dental practitioners made very little use of the services available to them;

- It seemed that librarians recognized the importance of providing services to that population. However, few libraries promoted their services among dental practitioners. The main reason was that these dental libraries were primarily committed to providing services for undergraduates and academic staff and sometimes they felt they would not be able to cope with the whole population of dentists in their areas.

This survey touched another issue in the provision of library and information services to dentists: whether these services can be better provided by separate on-campus dental libraries or by centralized on-campus libraries. Separate dental libraries made more promotion of their services, than centralized libraries. This fact was interpreted as an indication that dental school libraries were more aware of the information needs of dental professionals than the latter. This conclusion came from the following results:

- 34 centralized libraries replied the questionnaire and 41% of them promoted their services;

- 17 separate dental libraries replied the questionnaire and 53% of them promoted their services.

But the evidence for this conclusion was very thin, almost half of the libraries in both categories did not advertise their services for general dental practitioners.

4.1.5 Survey of Information Needs of General Dental Practitioners by Ashin-Strother, Lancaster and Gardiner

The information-seeking behaviour of general dental practitioners was studied by looking into their information needs and the information sources preferred to satisfy them by Ashin-Strother, Lancaster and Gardiner (1986).

Once more the method of data collection was a self-administered questionnaire, distributed by post. The population was wider than in previous studies, regarding the number of individuals in the sample but not in the geographic range it covered. A random sample of 500 dentists was selected from the 1984 *Official List of Dentists and Dental Hygienists* of the Louisiana State Board of Dentistry (USA).

The response rate was high: 71% and reducing to 69% for actual data analysis. The survey analysed the data in terms of:

- professional characteristics

  1. general/specialized practice
  2. solo/non-solo practice
  3. location of practice (urban, semiurban, etc.)

    4. postgraduate qualifications

    5. work at the dental school

- information needs

    1. reasons for seeking information

    2. kind of information needs and their frequency

    3. information sources

    4. reasons for preferences

There was no correlation between the two groups of variables.

The results provided the following profile: the surveyed population was constituted mainly by general dental practitioners, working in solo practices, established in urban or semi-urban areas. Less than a third of them had postgraduate qualifications. Nearly half of them received 3 or 4 journals by personal subscription. Only 16% of the respondents worked in some capacity at a Dental School.

Their most frequent reasons for seeking information were, in descending order, *keeping-up-to-date, patients treatment, practice management, research.*

New techniques in Dentistry was the kind of information most frequently required; all the other types of information were required mainly *sometimes.*

Their preferred sources of information were in first place: *professional colleagues* and *personal journals collections.* A second preferred group was represented by: *continuing education, meetings and personal book collection.* The least preferred source was the library. These preferences were based on *convenience* followed by *reliability* as the main reasons; only 7% of the respondents identified *low cost* as a reason for preference.

4.1.6 The Information Needs of Paramedical and Dental Staff: survey in Haringey Health Authority (U.K.) by Hewlett

The idea for this survey (Hewlett, 1986) came from one of the conclusions presented by Wilkin in her review of the information needs of practitioners, where she had pointed out that *'there is virtually no information on, for example, dentists, and paramedical professions...' (Wilkin, 1981a p.2-1).* The first part of the survey included an extensive literature review of user studies considering practitioners, paramedical staff and health care in general.

His main conclusions from this part of the survey, which are still valid for the present research are:

1. most user studies in the health care field are focused on medical doctors' information needs and very little attention has been paid to other practitioners in the health care field;

2. the latest user studies in the health care field are library and information services oriented, i.e. their main objective has been to examine the interaction user-library rather than the user's interaction with ALL sources of information.

The survey itself examined the whole population of employees at Haringey Health Authority in the categories of paramedical and dental staff, 171 individuals. This group included 11 dentists and 17 paradental staff.

It is the only user study that has included paradental staff so far. But this is the smallest sample of all the studies[6], and both categories: *dental professionals* and *dental auxiliaries* were analyzed together because of its size.

The method of data collection was again self-administered questionnaire, sent by post. The questionnaire covered the following aspects:

- *personal characteristics of the respondents*

- *information sources*

  - *use*

  - *relative importance*

- *use of libraries*

- *information needs and successes*

  - *reasons for seeking information*

  - *level of satisfaction*

- *suggestions for improving information provision*

The overall response rate was 62%. However, if we examine our specific group of users: dental and paradental staff, we find that the overall response rate was only 57%; only 6 dentists and 10 dental auxiliaries replied the questionnaire. The interpretations of results regarding this particular subgroup must therefore be especially cautious.

The most significant results from an extensive statistical analysis were:

- Although *journals* were the overall most preferred information source, in the case of dental staff, they preferred *professional colleagues at work.*

- *Journals* and *books* were ranking first when the relative importance of each source was analysed and dental staff –in this case– considered *journals* the most important information source.

- When use of information was related to professional age: both *journals* and *professional colleagues at work* appeared as the most used sources for all age-groups; the relationship was significantly higher than for all the other cases.

- Bench books' collections were most frequently used when they were in the same building.

- *Keeping up to date* was the most frequent and important reason for seeking information in all groups of users, including dental staff. In nearly all cases, dealing with patients was the second most frequent reason.

Although the survey included non-library related information sources, such as colleagues, the final recommendations were ALL library oriented and directed to improve the provision of library and information services in a specific organization.

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[6]See Table 4.1.

4.2 Discussion of the studies

The hypothetico-deductive paradigm has guided the design of all these studies. They are linear studies, selecting just a few members of a target population and collecting data about certain variables. Most of them are purely descriptive studies. If they test some hypothesis, the hypothesis refers to a very narrow aspect of information-seeking behaviour. In this way we only know about isolated events that occur when a dental professional needs certain information. For example how dentists in a specific region of the USA have learnt about the Maryland bridge[7] or what information sources are preferred to find out about drugs[8]. But this sort of user study will never render a complete description of the information-seeking behaviour of specific groups of users.

The different features of the information-seeking behaviour of dentists that have been explored are difficult to integrate in a single picture of that behaviour. This is mainly because the results refer to very dissimilar populations. On the other hand, data has been collected about similar issues: preferred information sources, adoption of innovations..., but variables have been.defined differently from one study to another one.

The following sections show how the samples have been defined and then how data has been collected.

4.2.1 Populations

They differ in the size of the sample, location and category of dental professionals included (See Table 4.1).

Samples are small compared with the target population, for example the two surveys by Walker and the study by Murray.

Sometimes the individuals of the sample are identified just as *dentists*, without identifying sub-populations by kind of professional practice; this is the case of Murray, Duxbury & Leach, and Ashin-Strother et al. In other cases the individuals of the sample are from different professional categories. But the categories are not distinguished for data collection and analysis either because it was assumed that they are similar (Walker 1/2) or because the total sample was very small (Hewlett). They may also belong to a single category, namely general dental practitioners (Sarll and Holloway; Ashin; Landesman).

Some studies have sampled the whole target population, such as Ashin and Hewlett, but other studies have not even used a random sample because of time constraints to obtain data (Walker 1/2).

Small samples, selected with different criteria, are therefore a major obstacle to the integration of results. A further limitation appears when these small samples are combined with only a moderate response rate (See Table 4.1); a problem that is in fact associated with the method of data collection rather than with the size of the sample.

The way in which these samples have been built does not allow exploration of the patterns of information-seeking behaviour of different professional categories, such as general dental practitioners, academic staff, etc. Most of our current knowledge applies to general dental practitioners, while we still do not know enough about some

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[7]See page 32.
[8]See page 29.

User study	Population			Response rate	Method of data collection
	Size of sample	Location	User		
Walker No.1	140 *	Great Britain	g.d.p. c.s.d.	56%	questionnaire
Walker No.2	100*	Great Britain	h.s. a.s	64%	questionnaire
Murray	130*	Southern state of USA	dentists	60%	interview questionnaire
Duxbury and Leach	not known	North Western Regional Drug Information Unit	dentists		recorded enquiries
	18**	Great Britain		33%	questionnaire
	not known	Manchester University Dental Hospital			recorded enquiries
Sarll & Holloway	148*	Greater Manchester	g.d.p.	72%	questionnaire interview
Ashin	60***	USA	g.d.p.	88%	questionnaire
Ashin-Strother et al.	500*	Louisiana State (USA)	dentists	69%	questionnaire
Hewlett	171* [a]	Haringey Health Authority (UK)	dentists	62%	questionnaire
	28* [b]		paradental staff	57%	
Landesman et al.	2401*	Southern California Pennsylvania (USA)	g.d.p.	52.3%	questionnaire

[a]whole survey
[b]dentists and paradental staff

* individuals
** drug information centres
*** dental school libraries

Abbreviations
a.s.: academic staff
c.s.d.: community service dentists
g.d.p.: general dental practitioners
h.s.: hospital staff

Table 4.1: Comparison of user studies

other groups within the dental profession, for example, community service dentists. Furthermore, general dental practitioners are in themselves a category large enough to deserve a deeper analysis. They are in fact the largest group within the profession, for example in 1988 there were 15,070 general dental practitioners, 1,988 hospital dentists and 1,662 community service dentists working for the National Health Service in England [9]. These general dental practitioners work in practices of different sizes regarding the number of dentists, auxiliary staff and patients.

Another source of dissimilarity comes from the different locations of the various studies. The geographic extent of the populations studied ranges from a local health authority of the NHS (U.K.), as for example Hewlett, to a whole country as the Walker's surveys. Despite this range of geographic areas, all the studies refer either to the U.K. or to the USA. As a consequence our fragmentary knowledge of the information-seeking behaviour of dentists applies only to the dental professions in these two countries, and therefore only to the use of information resources within those two countries. Moreover, it applies solely to the use of information resources in English language.

This limitation: the one regarding the location of the population, is very difficult to overcome in practical terms. Any kind of social research –since it is not only a restriction of the survey approach– is bound to be limited in space and time.

On the other hand the way in which these samples have been chosen –disregarding the location– is the main reason why these studies have not succeeded in rendering a more comprehensive description of the information-seeking behaviour of dentists. A sample including all different categories of dental professionals –even when it may cover a small geographic area– seems more likely to achieve this goal.

4.2.2   Methods of data collection and analysis

Self-administered questionnaire, sent by post, has been used by all the studies, either on its own or in combination with interviews (Murray; Sarll & Holloway) or analysis of enquiries (Duxbury & Leach).

The very nature of the postal questionnaire has provoked a predominance of questions of facts over questions of opinion (Stone & Harris, 1984). As a consequence, we know for example, WHAT information, source or service the dentists use; HOW MANY times they use the libraries, HOW MANY journals they subscribe to, WHICH information source is more important than others, WHICH information need is more frequent than others. But we still do not know WHY they prefer one information source to another one, nor HOW they go from one information source to another one until they feel that their information need has been satisfied.

The structure of the questionnaire has determined the kind of data to be collected. In order to help data analysis mainly for quantitative purposes, they have preferred close format questions in most cases. This format has implied use of pre-defined categories for *information needs* and *information sources*. While the categories for information needs are fairly similar from one study to another, the categories for information sources are almost impossible to compare. However many of the studies reveal a bias towards library-related sources and within them towards printed primary sources (i.e. journals, books, government publications, etc.). Less detailed categories

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[9]Figures from: Great Britain. Department of Health. *Health and personal social services statistics for England; 1990 edition.-* London: HMSO, 1990, p.50;53;68-9;72-3.

are specified under informal communication channels. We also need more data about the use of reference sources such as indexes or databases and the use of audiovisual materials.

Information needs have been defined in terms of reasons for seeking information; only in one case have categories for type of information required been included as well[10]. However the type of the information required, i.e. **'what is needed?'** is related to the reasons for requiring that information, i.e. **'why that information is needed?'**. For example, the required information for preparing an undergraduate lecture on 'new developments in glass ionomers materials' is likely to vary in degree of extension and detail from a lecture on the same subject to postgraduate students. This variation in turn may affect the choice of information source and the number of information sources used in each case. However, this relationship has not yet been studied (Ashin-Strother, Lancaster & Gardiner, 1986).

The information-seeking behaviour of dentists has been studied in terms of isolated variables: information sources used, number of meetings attended, number of journals subscribed to, etc. But the use of several information sources is seldom related in some meaningful sequence, such as the one in Landesman's study: *first source of information, first source of learning and first source for keeping-up-to-date for a given innovation*. At the same time data collected about personal characteristics of the dentists are not usually correlated with information needs or preference for information sources. Finally, statistical analysis has been limited in many cases to simple frequencies of occurrence probably largely due to small sample size in relation to the degree of inter-individual variation.

4.3 Conclusion

What have we learnt about information-seeking behaviour of dental professionals from all these studies?

Despite the methodological disparities and limitations, certain characteristics emerge regularly such as:

- dental professionals need information mainly for keeping-up-to-date and dealing with patients;

- journals are frequently identified as their most 'important' source of information, although it is not always the first one since this place is contended by 'colleagues at work';

- library and information services are the least used source of information;

- continuing dental education (CDE) has a less relevant role as source of information than the one usually assumed;

- working environment determines information needs and influences preferences regarding the use of information sources.

However, seeking information constitutes a far more complex behaviour and these few characteristics neither describe it fully nor explain it in-depth. The interaction of

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[10]See 4.1.5.

dental professionals with all sources of information in the health care system is still unexplored (Sarll & Holloway, 1982). The paths that they follow from the moment an information need is recognized to the moment it is satisfied by means of one or several information sources have not yet been identified (Wilson, 1981b).

Insight into these aspects of information-seeking behaviour of a particular group of users –in our case: the dental professionals– requires a different methodological approach along the lines of the holistic-inductive paradigm.

Chapter 5

The Holistic-Inductive Paradigm and the Design of the Present Study

5.1 Methodological approach

The aim of the present study is to develop an explanation of the information-seeking behaviour of dental professionals that relates the three main aspects of this behaviour (users, their information needs, use of information sources) in a meaningful way. A meaningful explanation of that behaviour has to include not only the activities performed to find information but also the reasons that provoke that seeking and a description of the context in which information needs and information-seeking activities targetted at different information sources occur.

Since the central research question is **how dental professionals actually seek information** rather than, for example, how dental professionals use a specific information service, and the reply has to provide an explanation in the terms outlined above, the research requires a different methodological approach from that of previous user studies in Dentistry. A hypothetico-deductive paradigm accepting information as having a reality of its own and using quantitative analysis will not go beyond proving or falsifying the results already obtained. The discovery of the interactions between dental professionals and information sources requires a holistic-inductive paradigm, interpreting information as the actions performed by individuals in the process of understanding reality[1], and using qualitative analysis.

A holistic inductive paradigm has three main characteristics: i) it studies the phenomena in their entirety (*holistic view*); ii) it looks at the phenomena as they naturally occur (*naturalistic enquiry*); iii) it collects data on individual occurrences of the phenomena and then the general patterns are discovered from the analysis of these individual occurrences (*inductive approach*) (Patton, 1980).

The approach of this study is holistic because it considers information-seeking behaviour as a phenomenon resulting from the interaction between individuals and information sources in the context of work-related situations that provoke information needs. Individuals, information sources and information needs are also considered from a holistic perspective. This study looks into the information-seeking behaviour of

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[1]See Dervin's levels of information page 11.

dental professionals practising Dentistry in general practices, hospitals, dental schools and the community dental service. Their behaviour is examined by considering the use of all kinds of information sources, i.e. *printed literature, colleagues, continuing education events, audiovisual materials, computer-based systems, library and information systems.* Finally, the study explores which are the information needs related to each kind of professional practice.

Drawing the boundaries around the phenomenon under study is the inevitable problem of a holistic approach. A holistic study needs to find a balance between extension and intention, i.e. we need to decide a balance between how large a system we are going to study and how much detail about it we want to include (Diesing, 1971). A specific research project needs to draw boundaries regarding time, space, individuals and events to be studied. While the information-seeking behaviour of dental professionals is a continuum, we can only study a section of that continuum at a certain point in time and space, including a finite number of individuals and events. These specific boundaries are explained in the next section[2].

A naturalistic enquiry into the information-seeking behaviour of dental professionals implies collecting data about that behaviour as it naturally unfolds. Data collection aims at detailed descriptions of information-seeking activities without manipulating the conditions under which these activities occur. Such descriptions can be obtained mainly by means of direct observation of these events or by interviewing the actors of these events.

In the case of this study observation was not practically possible. It would have meant selecting a few individuals and observing them over a fixed period (a week, a month, etc.) during which there was no guarantee that they would actually enact every variation of their information-seeking behaviour. For example, a general dental practitioner may not need information about a new technique, material or medication in weeks, if not months.

Another obstacle for using observation was gaining acceptance to carry out the research. Observation, in this case, meant that the researcher, who is not a dentist herself, would have had to stay with the dental professional throughout the daily routine, in the presence of patients and other professionals while confidential information that had no relevance to the project was disclosed. It was unlikely that the researcher would have been accepted in those circumstances, and besides, it would have been a very intrusive way of collecting data.

As a consequence, interviewing dental professionals and gathering their descriptions about information-seeking events was the preferred alternative. The design of the interview schedule and the reasons for preferring interviewing to questionnaires and diaries are explained in section 5.2.2.

The descriptions conveyed by the interviews comprise qualitative data in the sense defined by Patton (1980, p.36), i.e. they describe situations when information is required, information-seeking activities, ways of using information sources, and they do so from the dental professionals' own perspectives.

These descriptions refer to individual occurrences of information-seeking behaviour. Each description represents a unique instance of that behaviour. The analysis of these occurrences will show common characteristics, recurrent patterns and relationships that can explain the information-seeking behaviour of dental practitioners in general.

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[2]See 5.2.1 and 5.2.2.

In that way the *inductive approach*, the third characteristic of the holistic-inductive paradigm is met. The *inductive approach* guides the last stage of the research strategy defined for this study: content analysis of the interviews (See Figure 5.1).

The content analysis will discover the characteristics, patterns and relationships that explain the information-seeking behaviour of dental professionals. This explanation will be inductively derived and grounded in the dental professional's own replies. A style of qualitative analysis that is compatible with this research approach is grounded theory. Grounded theory analysis is used as a tool for systematic coding and comparison of the replies. The coding and comparison of the replies is based on a *coding paradigm* explained in 5.2.3.

5.2 The research instruments

5.2.1 Definition of the sample

The sampled population had to include a group of dental professionals representing all kinds of dental practice, having access to similar information sources and being easily accessible from the site of the research, the University of Sheffield.

The *Nuffield Report on Dental Education* distinguished six groups of dental professionals: *general dental practitioners, hospital dentists, academic staff, community service dentists, dentists in the Armed Forces* and *dentists in industry* (Nuffield Foundation, 1980). Only the first four groups were included in the study. There was no possibility of gaining access to defence institutions for interviewing their dental staff, so *dentists in the Armed Forces* could not be included in the study. *Dentists in industry* were also excluded on the basis that they did not constitute a large enough group. In 1980, the *Nuffield Report* mentioned that there were '*about 120 dentists in some form of industrial practice*' in the United Kingdom (Nuffield Foundation, 1980 p.21). Even though that figure might have changed since then, it would have resulted in too small a group at the local level to be representative of dentists in industrial practice at the national level.

On the other hand, dentists who were postgraduate students – a group not identified by the *Nuffield Report* – were included because they represented the only case of dentists doing research work exclusively.

Sheffield District Health Authority which provides dental treatment at general practice and community service levels and contains one of the 16 dental schools[3] in the United Kingdom, the *School of Clinical Dentistry, University of Sheffield*, and its associated dental hospital, the *Charles Clifford Dental Hospital*, represented the most accessible unit in geographical terms for carrying out the study.

Therefore the sampled population included all qualified dentists

- who were either *general dental practitioners, hospital staff, community service dentists, academic staff*, or *postgraduate students*,

and

- who were working/studying within the geographic limits of Sheffield District Health Authority, but not necessarily under contract with this health authority.

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[3]This number will be reduced to 14 as a result of the recommendations by the Dental Review Working Party (University Grants Committee. Dental Review Working Party, 1988).
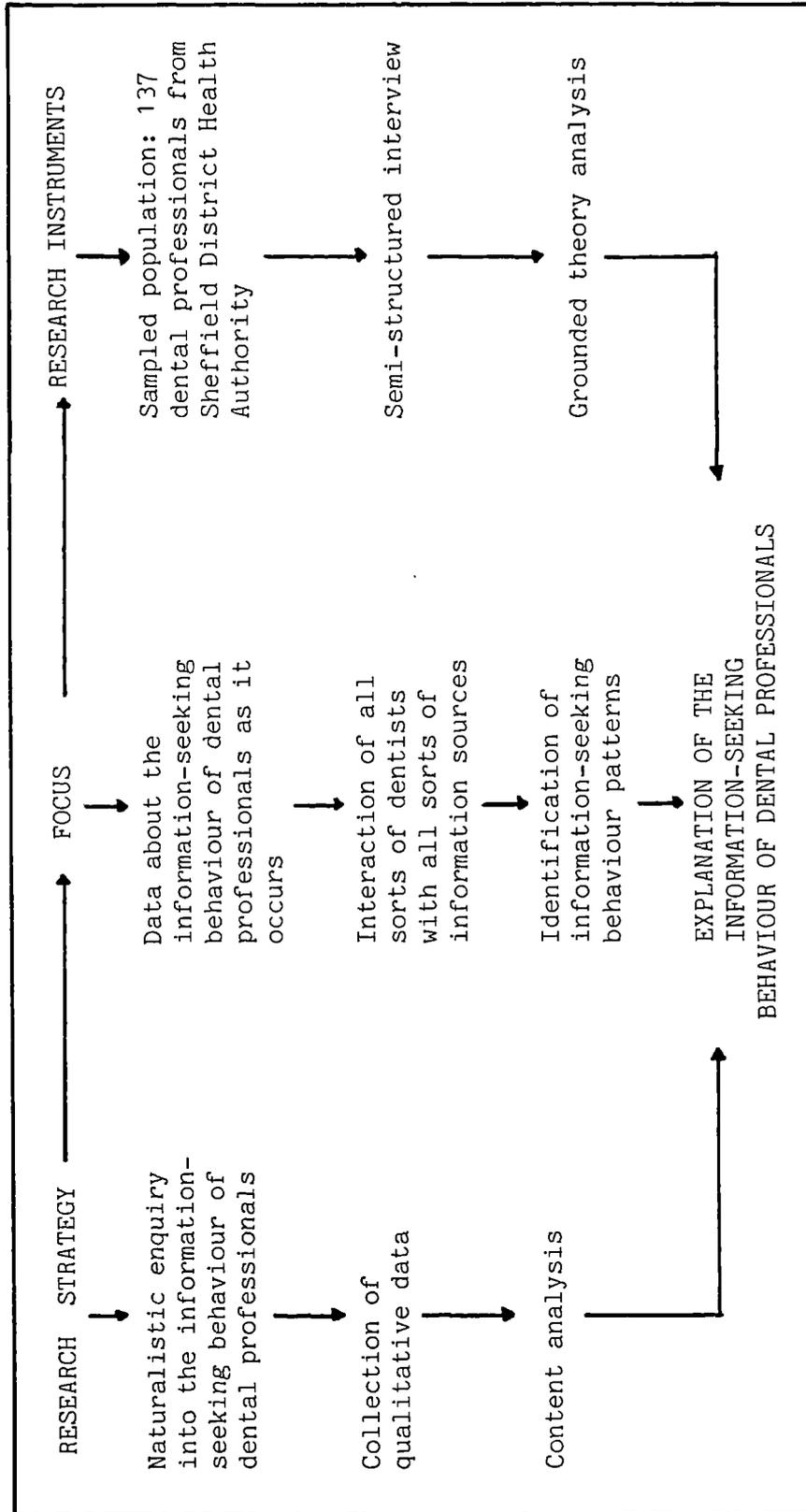
Figure 5.1: The holistic-inductive paradigm and the general design of the study

By definition, retired dentists and dentists temporarily out of practice were not included in the study.

The actual individuals in each subgroup of the sample were identified using information issued by:

- Sheffield Family Health Services Authority (SFHSA), the former Sheffield Family Practitioner Committee, for general dental practitioners, providing NHS treatment;

- University of Sheffield School of Clinical Dentistry for postgraduate students, academic staff and hospital dentists at the Charles Clifford Dental Hospital;

- District Dental Officer for community service dentists.

- *The Dentists Register 1989* for tracing general dental practitioners in private practice.

The different lists of dental professionals were checked and compared in order to avoid interviewing the same person more than once. Each dentist was counted only once for sampling purposes. Dentists who worked in more than one branch of the dental service were considered in the subgroup where they practised most of the time. For example, a dentist working for the Community Dental Service and reading part-time for a postgraduate degree was counted as *community service dentist*; a dentist in general dental practice and doing a weekly session at the dental hospital was counted as *general dental practitioner*. All *hospital staff, community service dentists, academic staff and postgraduate students* were interviewed, whilst a random sample was used in the case of *general dental practitioners*.

Each subgroup of the sample was formed in the following way:

General dental practitioners (GDPs): 57 dentists providing NHS treatment under contract with the Sheffield Family Health Services Authority (SFHSA). The interviews were done during the period February to June 1990.

General dental practitioners were the largest group of dental professionals both at national and local levels[4]. In the first place, they were subdivided into dental practitioners in private practice only and dental practitioners providing NHS treatment, and each subgroup was considered separately for sampling purposes.

- Dental practitioners in private practice only.
  The names of dentists, entered in the 1989 Dentists Register under *'Sheffield'* in the local list index, were compared with the lists for the previous subgroups. Those who did not appear under any of these categories (i.e.: they did not appear as *postgraduate students, academic staff,* etc.) were traced in the 1989 and 1990 editions of the Sheffield Telephone Directory. When the address was within the boundaries of Sheffield District Health Authority the dentist was contacted by telephone to verify: i) whether s/he was still living there; ii) where s/he was practising. Only one purely private practice was eventually identified, since most of the dentists

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[4]See problem of sample size for general dental practitioners in **User Studies in Dentistry** page 38.

traced in that way had already moved out of Sheffield or did not practise in the area.

As a consequence there were not enough purely private dentists in Sheffield District Health Authority to consider them as a special subgroup of general dental practitioners. However this would not necessarily be the case in other District Health Authorities in the U.K.

- Dental practitioners providing NHS treatment.
  The directory of doctors, dentists, opticians and pharmacists published in January 1989 identified 188 general dental practitioners providing dental treatment under the National Health Service (Sheffield Family Practitioner Committee, 1989). They were subdivided by the number of dentists working together in the same practice, which gave six subgroups, comprising solo practices up to practices of six dentists. A 30% sample was randomly selected for each of these subgroups resulting in:

  - 11 dentists in solo practice;
  - 10 dentists in practices of two dental professionals;
  - 15 dentists in practices of three dental professionals;
  - 14 dentists in practices of four dental professionals;
  - 5 dentists in practices of five dental professionals;
  - 2 dentists in practices of six dental professionals;
  - 57 dentists as the final sample for general dental practitioners.

  A stratified sample – instead of a simple sample – was preferred to allow a proportional representation of dental practices of different sizes (size counted as the number of dentists working together) (Satin & Shastry, 1983).

Hospital staff (HS): 29 dental staff working at the Charles Clifford Dental Hospital and employed by Sheffield District Health Authority as at 1st October 1989. It included part-time consultants, who had similar full-time positions outside Sheffield District Health Authority. The interviews were done during the period October to December 1989.

Community service dentists (CSDs): 15 dentists employed, both full-time and part-time, by the Community Dental Health Services of Sheffield District Health Authority, as at 1st August 1989.
The interviews were done during the period August to September 1989.

Academic staff (AS): 24 university staff, with dental qualifications working at the School of Clinical Dentistry of the University of Sheffield as at 1st January 1989. The interviews were done during the period June to July 1989.

Postgraduate students (PS): 12 full-time students with dental qualifications, registered for a postgraduate degree at the School of Clinical Dentistry of the University of Sheffield, during the 1988-89 session. The interviews were carried out in May 1989.

The total sample for the study was 137 dental professionals in the area of Sheffield District Health Authority.

5.2.2   Design of the interview schedule

It was necessary to use a method of data collection that was both suitable for gathering the data required by the study and acceptable to the dental professionals. Detailed descriptions about information needs, how they were met and how different information sources were used, were more likely to be obtained by means of a personal dialogue than by a self-completed questionnaire arriving by post mixed with advertising literature of all kinds. Keeping a diary of information-seeking activities would have been another burden to the dentists' routine, and gaining their co-operation would have been more difficult than in the case of a personal interview. As already mentioned, direct observation would not have been possible for ethical reasons. As a consequence interviewing was the more suitable method for collecting data and the most likely to be accepted by the individuals of the study.

However, interviews could not be longer than one hour in order to gain the co-operation of practitioners with heavy clinical workloads. A semi-structured interview schedule combining closed and open-ended questions was the best way of keeping the length of the interview within the one hour target.

The interview schedule (See Appendix 1) covered

- *information needs* regarding the interviewee's job, innovations in Dentistry (new dental techniques, materials and equipment), postgraduate studies and publications;

- *use of information sources*: continuing education events, colleagues, other individuals, printed literature, audiovisual materials and library and information services;

- *personal organization of information*, including use of computers;

- *personal data* regarding educational background and job characteristics of the interviewees.

The interview schedule tried to cover all possible aspects of information-seeking in order

- to reduce dependence of data on the interviewee's own memory, for example an on-line literature search requested some time ago may not be mentioned unless specific questions are asked about it;

- to reduce interviewee's bias, for example the interviewee may think that the *journal club* is not relevant for finding information and therefore s/he would not mention it unless s/he is asked to describe meetings with colleagues.

The interview schedule took themes from previous user studies. For example, it covered, from a qualitative point of view, the use of printed literature, colleagues and library services discussed quantitatively by Walker (Ford, Maguire & Walker, 1980), Ashin (1983), Ashin-Strother, Lancaster & Gardiner (1986) and Hewlett (1986). The section about information needs and innovations in Dentistry was based on the studies by Landesman (1986) and Sarll & Holloway (1982). But the design was based on user studies outside Dentistry, especially on the study of demand and supply of business information by Roberts & Clifford (1984).

During April 1989 six pilot interviews were carried out with the cooperation of dentists from London, the Community Dental Service in Manchester and the University of Leeds Dental School. The aim of these interviews was to test the unambiguity of the questions and the duration of the interview.

The interviews were tape-recorded when the interviewee agreed, which was not always the case. On the whole, interviews took place in the surgery and background noise was unavoidable. So notes were taken systematically as the main record, and the tape-recordings were used as a complement when they had been both allowed and successful. Replies based on verbatim notes or transcriptions are quoted in italics; replies based on personal notes are quoted in squared brackets. Each quotation from an interview indicates the interview number and the question number, for example (Int.No.82/Q.5) at the end of a quotation means reply to question 5 by interviewee number 82.

5.2.3 Grounded theory analysis

Grounded theory is a style of qualitative analysis that focuses on generating theory and grounding that theory in data, as stated by Glaser (1978) and Strauss (1987) in their classical definition of the approach. The theory provides an interpretation of a phenomenon inductively derived from qualitative data as it occurs in the real world. In that way grounded theory is compatible with a *holistic view*, a *naturalistic enquiry* and an *inductive approach*, the three components of the holistic-inductive paradigm.

At the working level grounded theory analysis is a process of constant comparison of incidents[5]. In the context of this study, it meant a constant comparison of replies within the same interview and across different interviews. For example, one interviewee described an incident when he had sought information and how he had gone about it:

> It was a rare medical condition, he went to the library and requested an on-line literature search. 'A rare medical condition' is a situation when information is needed, 'going to the library' is a way of seeking that information, and 'requesting an on-line search' is a way of obtaining that information.

A similar coding throughout the interview gave the list of i) all situations when the interviewee sought information; ii) all ways of seeking information; iii) all ways of obtaining information. The same coding throughout different interviews gave a similar categorization for each subgroup of dental professionals.

That initial comparison organized the interview data into three main categories: i) dental professionals, ii) their information needs, iii) their use of information sources. The comparison continued looking for relationships between these categories at individual level and across every subgroup in the study (Glaser, 1965).

In order to be systematic and meaningful, comparison and coding of incidents and categories follow a **coding paradigm** (Strauss, 1987). The analysis of interview data oultined above was based on Strauss' coding paradigm, but this paradigm was redefined within the terms of this study.

The **coding paradigm** – as it was used in this study – defines conditions, strategies, interactions and consequences as follows:

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[5]Originally Glaser called this approach *the constant comparative method* (Glaser, 1965).

Conditions : the situations when dental professionals recognize the need to obtain information in order to deal with them. These situations are the prerequisite for seeking information. They describe the circumstances under which dental professionals engage in some sort of information-seeking behaviour.

Strategies : the actions performed by the dental professionals in order to obtain the required information. These actions involve the use of one or several information sources.

Interactions : the ways in which information sources are used when dental professionals select them to find out the required information.

Consequences : the results of the interactions, i.e. the information obtained from an information source by means of a strategy. The results will define whether the information need has been satisfied and therefore the seeking of information is no longer necessary; or whether further information is required and therefore other strategies should be implemented.

A complete integration of **conditions, strategies, interactions and consequences** provided a model of the information-seeking behaviour of dental professionals outlined in the next section.

5.3 A model of the information-seeking behaviour of dental professionals based on grounded theory analysis

The **coding paradigm** explained in the previous section guided the systematic analysis of interview data. As data analysis progressed a model of information-seeking behaviour of dental professionals was developed. That model was derived from the replies of dental professionals interviewed, and it was applied to analyze the information-seeking patterns of five different groups of them: *general dental practitioners, hospital staff, community service dentists, academic staff*, and *postgraduate students*. This section gives the general version of that model as it is used in the next five chapters to present the results.

Dental professionals face information needs in the course of their clinical or academic tasks (**conditions**). They meet these information needs by means of certain information-seeking activities (**strategies**). These strategies are associated with certain information sources which are used in different ways (**interactions**).

Dental professionals apply six basic strategies for seeking-information:

- **Reading**

- **Talking**

- **Enquiring**

- **Attending/organizing continuing education events,**

- **Watching**

• **Using the library**

These strategies are considered **basic** ones because they can be implemented on their own, independently of each other to satisfy a particular information need. Each of these strategies is associated with the use of certain information sources and they have variations that reflect the different ways in which users interact with the respective information source.

Reading: to find information by scanning written/printed documents. The associated information source is literature, either written, for example the clinical history of a patient, or printed, for example a journal article. The variations of this strategy are i) *general reading*: regular scanning of the literature without looking for a specific topic; ii) *reading on specific topics*: checking the dental literature to find out information about a specific item. The literature associated with this strategy is always available at work or at home, for example the patient's file that is brought by the dental nurse, the journal that comes regularly by post. It does not include literature obtained via the library system, because the use of that literature requires another strategy: **Using the library**.

Talking: to find information by discussion with other dentists. Colleagues are the associated information source. The variations of this strategy are: i) *informal conversations* that originate spontaneously as part of every day work or at social gatherings; ii) *formal meetings* set up to discuss cases, techniques or new developments. This strategy relies on personal knowledge of the interlocutor, who is a friend, a member of the family, a colleague at work, i.e. always somebody who is known personally. This is one of the main differences between this strategy and **Enquiring**.

Enquiring: to request a specific piece of information from an individual or an organization. Enquiries are made in person, over the telephone or in writing. It is usually associated with individuals from other professions or occupations. This strategy always implies purposive information-seeking, i.e. the dentist is consciously looking for particular information, while **Talking** in its informal variations becomes a non-purposive information-seeking strategy.

Attending/organizing continuing education events: to find information at courses, conferences, lectures, presentations and dental fairs. The variations are *attending*, *organizing* or *conducting* the event. This strategy is always implemented to satisfy long-term information needs, for example learning about the use of a new dental material that the dentist might start using at a later stage; because of that it is never selected as an initial strategy. Any of the other strategies are likely to provide more immediate results.

Watching: to find information by using audio-visual sources of information. The associated information sources are audiovisual materials. It is not extensively used and because of this no variations are distinguished. It is preferred for communicating information rather than seeking it, and thus is used by hospital and academic staff for teaching purposes. Apart from this, it is implemented for seeking information in the context of oral surgery techniques.

Using the library: to find information using library services. The variations of this strategy are i) *random subject searches*: regular or irregular scanning of dental journals straight from the shelves; ii) *document searches*: looking for specific documents whose references have been previously obtained from a colleague, another paper or a current awareness service; iii) *formal literature searches*: looking for literature

in the *Index to Dental Literature* (manual search), or requesting an on-line literature search from the library. This strategy is closely related to **Reading** but it is implemented on its own, and moreover it is selected as an initial strategy, for example a dentist needs information about a rare medical condition and requests an on-line literature search from the library. While **Using the library** is inevitably associated with **Reading**, the latter does not necessarily imply the former.

The results of implementing any of these strategies will determine whether the information need has been satisfied or not (**consequences**). If the information need has been satisfied the seeking stops; if not, another strategy is selected using a different source (See Figure 5.2). In theory this process can continue indefinitely, but in the case of the dental professionals, we find:

Simple patterns : one single strategy satisfies the information need. **Simple patterns** represent the most economic way of finding information. For example, **Reading** provides all the necessary information about a particular medical condition:

> *R: If somebody comes with a medical condition I'm not familiar with,*
> *then obviously I'd have to look it up.*
> *I: How do you find the information about...?*
> *R: I normally look it up in a textbook.*
> *I: Do you look for information in any other way?*
> *R: No.*
> (Int.No.116/Q.1)

Combined patterns : two different strategies are implemented either because the first one fails or its results are incomplete. These patterns appear when the initial strategy has not provided enough information. For example:

> [The respondent received three weeks ago a child suffering from 'Swchawman Diamond Syndrome'. A rare medical condition that she had never come across before and she needed information about because it was affecting the child's diet and therefore the child's dental health. First of all she rang the general medical practitioner in charge of the patient but he was not very helpful. Then she went to the Medical and Dental Library at the university and requested an on-line literature search on that particular condition.] (Int.No.51/Q.1).

Enquiring from the general medical practitioner was not successful, so another strategy: **Using the library** was selected.

Combined patterns also appear when different types of information available from different sources are necessary. For example:

> [The respondent was reading for a Master of Dental Surgery by research only. A manual search was carried out in the Index Medicus and then an on-line search in Medline was requested from the University Medical and Dental Library for establishing what the baseline research was in the field of his project (Q.39;42) The actual research required contacts with other departments in the university in order

to use facilities and equipment that were not available at the dental hospital (Q.68)] (Int.No.63).

Using the library is complemented by **Enquiring**, while the first strategy provides the background information about the state of research on a particular topic, the second one provides more practical information that is necessary to carry out the actual project.

Complex patterns : more than two different strategies – usually three – are used before the information need is fully satisfied. They are a combination of as many basic strategies as it seems necessary. For example:

> *R: Mainly regarding types of dental attachments or a technical process.*
> *I: How did you find the information?*
> *R: Usually the first thing is through my technician, either by phone or personal visit.*
> *I: And then?*
> *R: And also to do an expanding on the subject I attended a local course given by one of the manufacturers.*
> *I: Did you seek information in any other way?*
> *R: I've read what I can. I mean... generally on the subject if it happened to be recently published articles on one of the journals that I take then I would have read it as well. I tend to find things out either in the journals or talk to people, to technicians generally.*
> (Int.No.111/Q.1).

Enquiring from the technician is the initial strategy that is complemented by **Attending...** a course and **Reading** the journals received at the practice. Each strategy extends the information seeking towards the satisfaction of the same information need by exploring a different information source and obtaining a different kind of information.

This model explains information-seeking behaviour by relating information needs, information sources and information-seeking activities as part of a whole process. The relationships between needs, sources and activities are based on natural occurrences of that process. The explanation of the information-seeking behaviour of dental professionals is derived from the analysis of individual occurrences of that behaviour. In that sense the model is holistic, naturalistic and inductively derived. At the same time it can be considered a 'grounded' model because it has emerged from the data and tested as data analysis progressed. The next five chapters present the evidence on which the model is based with reference to each group of dental professionals interviewed.
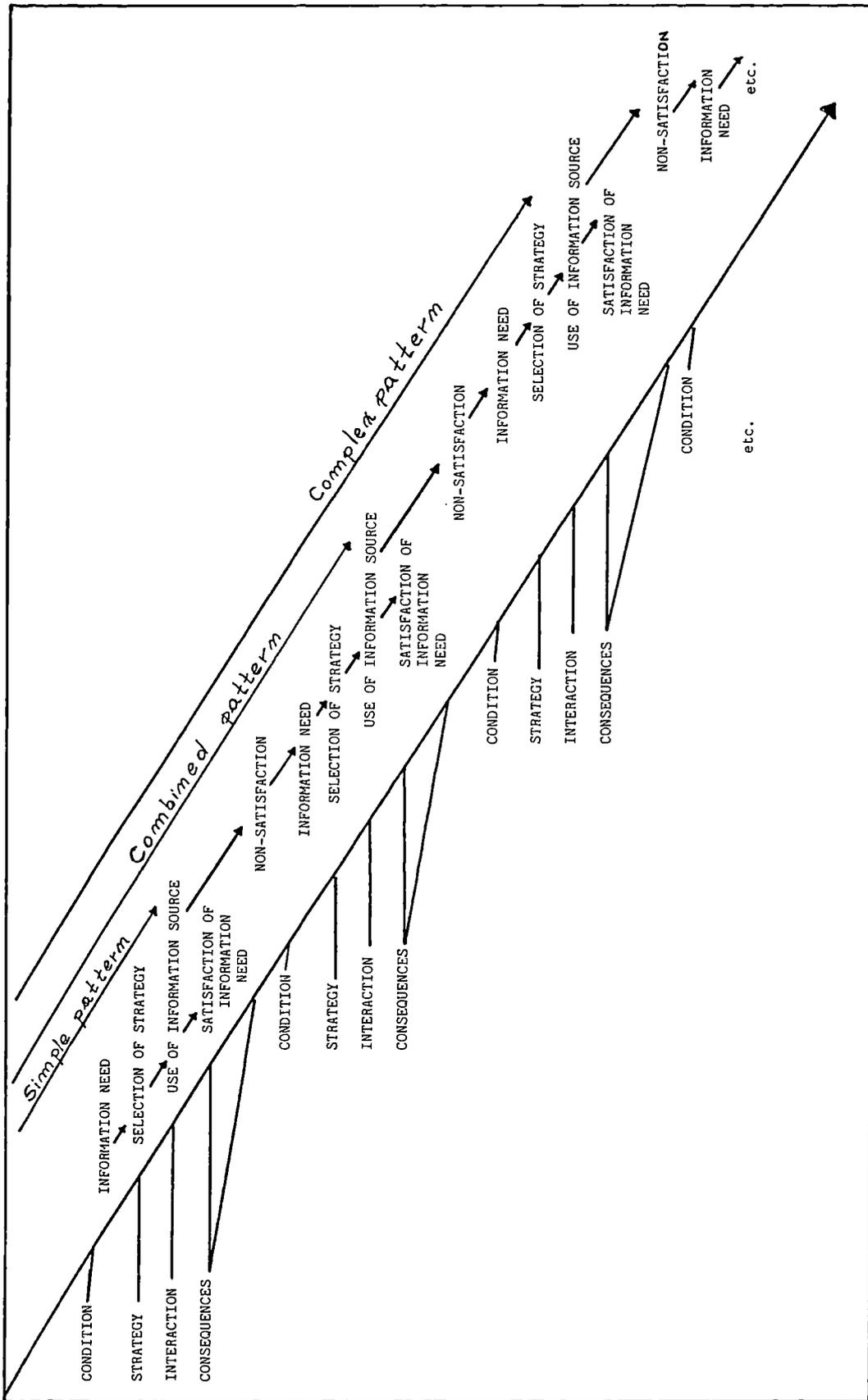
Figure 5.2: **Model of information-seeking behaviour based on grounded theory analysis**

Chapter 6

The Use of Information by General Dental Practitioners

6.1 The general dental practitioners

I interviewed 39 dentists, who worked under contract with the Sheffield Family Health Services Authority[1], throughout Sheffield, in practices of one to up to six dental practitioners[2].

These 39 interviews represent a 68.4% response rate to the initial request and is the lowest of any single group included in the study. If we look at the response rate of each subgroup of general dental practitioners (See Figure 6.1), we observe that one single subgroup –the solo practitioners– was the main reason for this low result. Only 3 dentists working in solo practices (out of eleven approached) accepted the interview. In all the other subgroups, the reasons for the refusals were mixed: some dentists declined, some others were not available during the scheduled period for the interviews and we could not therefore make an appointment, and in some cases I simply could not contact them at all. But the dentists working in solo practices seemed extremely relunctant and plainly refused to be interviewed when I first phoned them.

The 39 dentists who accepted the interview, collectively qualified between 1960 and 1986. Their professional age ranged between almost thirty years in practice and only three years experience (See Table 6.1). The majority of them (28) graduated from the School of Clinical Dentistry at Sheffield University (See Table 6.2). Three of them had further professional qualifications granted by the Royal Colleges of Surgeons of Glasgow and of England, but none of them had a postgraduate degree in Dentistry. Only two dentists were formally reading for a second degree (a master of general dental surgery and a medical degree) at the time of the interview (See Table 6.3).

Most of the people sampled were partners or associates in dental practices that provided full NHS treatment, and most of them worked full-time (33) at only one practice. There was a small group working in two or three different practices; at least one of their surgeries was in Sheffield, and the others were spread over Worksop, Rotherham, Bolsover and Dinnington (See Table 6.4, Table 6.5 and Table 6.6). Three interviewees had a part-time position at the Charles Clifford Dental Hospital, which involved a half-day clinical session once a week (Int.Nos.119;124;125/Q.53).

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[1] The former Sheffield Family Practitioner Committee.

[2] 5.2.1 indicates how the sample was built.

General response rate
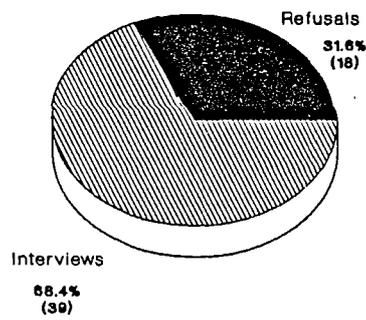
Response rate by size of practice
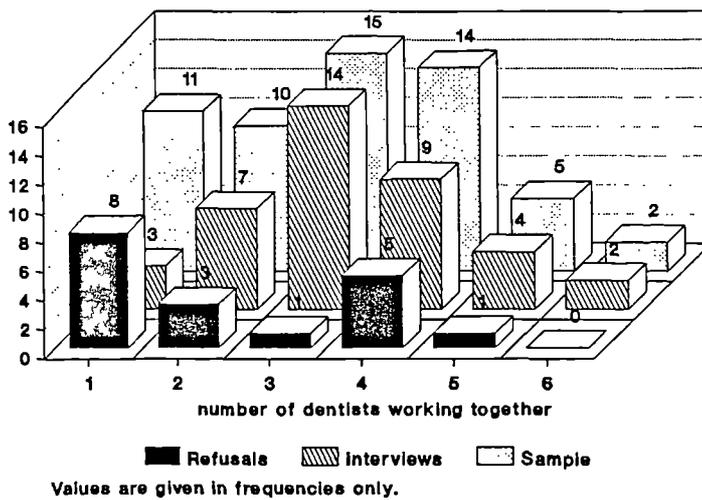
Figure 6.1: Response rate of general dental practitioners

Table 6.1: Interviewees by year of graduation

Year[a]	Graduates	%
1960	1	2.6
1961	3	7.7
1966	1	2.6
1967	1	2.6
1969	1	2.6
1971	1	2.6
1972	2	5.1
1973	1	2.6
1975	4	10.3
1976	3	7.7
1978	1	2.6
1979	3	7.7
1980	2	5.1
1981	4	10.3
1982	4	10.3
1983	2	5.1
1984	2	5.1
1985	1	2.6
1986	2	5.1
TOTAL	39	100.0

[a]Data from Q.48.

Table 6.2: Undergraduate training by dental school

University[a]	Graduates	%
Sheffield	28	71.8
Manchester	2	5.1
Leeds	4	10.3
Newcastle	2	5.1
London	1	2.6
Edinburgh	1	2.6
Abroad	1	2.6
TOTAL	39	100.0

[a]Data from Q.49.

Table 6.3: **Postgraduate training**

Level of training[a]	YES		NO	
	%	()[b]	%	()
Professional qualifications[c]	7.7	(3)	92.3	(36)
Postgraduate degrees	0.0	(0)	100.0	(39)
Current postgraduate studies	5.1	(2)	94.9	(37)

[a]Data from Q.50 and 51.
[b]Values in () indicate frequencies.
[c]Membership and Fellowship of the Royal Colleges of Surgeons.

Table 6.4: **Status in the practice**

Status[a]	Interviewees	%
Solo	3	7.7
Principal	5	12.8
Partner	16	41.0
Associate	15	38.5
TOTAL	39	100.0

[a]Data from Q.55.

Table 6.5: **Full-time/Part-time jobs**

Dedication[a]	Interviewees	%
Full-time	33	84.6
Part-time	6	15.4
TOTAL	39	100.0

[a]Data from Q.53.

Table 6.6: **Places of work**

Practices[a]	Interviewees	%
One	30	76.9
Two	6	15.4
Three	3	7.7
TOTAL	39	100.0

[a]Data from Q.55.

None of them worked single-handed, all having at least one dental surgery assistant. The team of paradental staff consisted chiefly of dental surgery assistants, working alternatively as receptionists. A few practices included dental hygienists, practice manageresses or dental technicians (Int.Nos.87;90;99;102;113;116;119;123;125;129; 131;136/Q.57). Only two practices had a part-time specialist to deal with orthodontic cases (Int.Nos.109;120/Q.55;60).

The vast majority of their patients paid NHS fees. The proportion of private patients was always estimated as being under 10%, and in fact these patients were not purely private ones, but those who had agreed to pay in full for treatment not covered by the NHS (Int.Nos.87-142/Q.54).

The general dental practitioners were not involved in research activities. Two interviewees had been trainers on the Vocational Training Scheme for General Dental Practitioners[3](Int.Nos.111;115/Q.60). As already mentioned, three dentists worked half a session once a week at the local dental hospital. In all cases they supervised the clinical work of young graduates or students, but apart from that nobody had teaching responsibilities of any kind. They did not publish papers or make presentations at conferences or congresses, since they neither researched nor lectured.

Only one was a specialist (Orthodontics); all the others identified themselves as general practitioners. As such, they were especially interested in Restorative Dentistry: the speciality being closely related to their everyday work.

6.2 The conditions for their information needs

The general dental practitioners exclusively described situations related to their clinical work (See Figure 6.2). They are seldom involved in academic activities such as research, writing papers or teaching and lecturing.

As in the case of hospital staff and community service dentists, the situations in their clinical work that demand information are associated with the following main activities: i) diagnosis; ii) treatment; iii) delivery of dentistry at practice level. However, each of these major activities is viewed from a different perspective by the general dental practitioners compared with the perspective of the other groups in the study.

The first group includes diagnosis, definition of treatment plan and referrals (Int.Nos.87;108;116; 137;138;141;142/Q.1). All these activities demand information on patients, that is, their medical and dental histories:

> 'Generally if there is going to be a problem it's because patients are unable to tell me clearly and precisely what their problem might be, regarding if they themselves have pain or if they have a dental problem or if they themselves have any medical problem which could compromise my treatment in some way, they are not able to explain sometimes what's wrong with them' (Int.No.142/Q.5).

> 'Medical histories is usually because the patients aren't exactly sure what they've got or what they are taking. If they are sure, I obviously can't take their word for it...' (Int.No.108/Q.4).

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[3]The scheme is run by the Trent Regional Health Authority and the Postgraduate Office based at the School of Clinical Dentistry of Sheffield University.
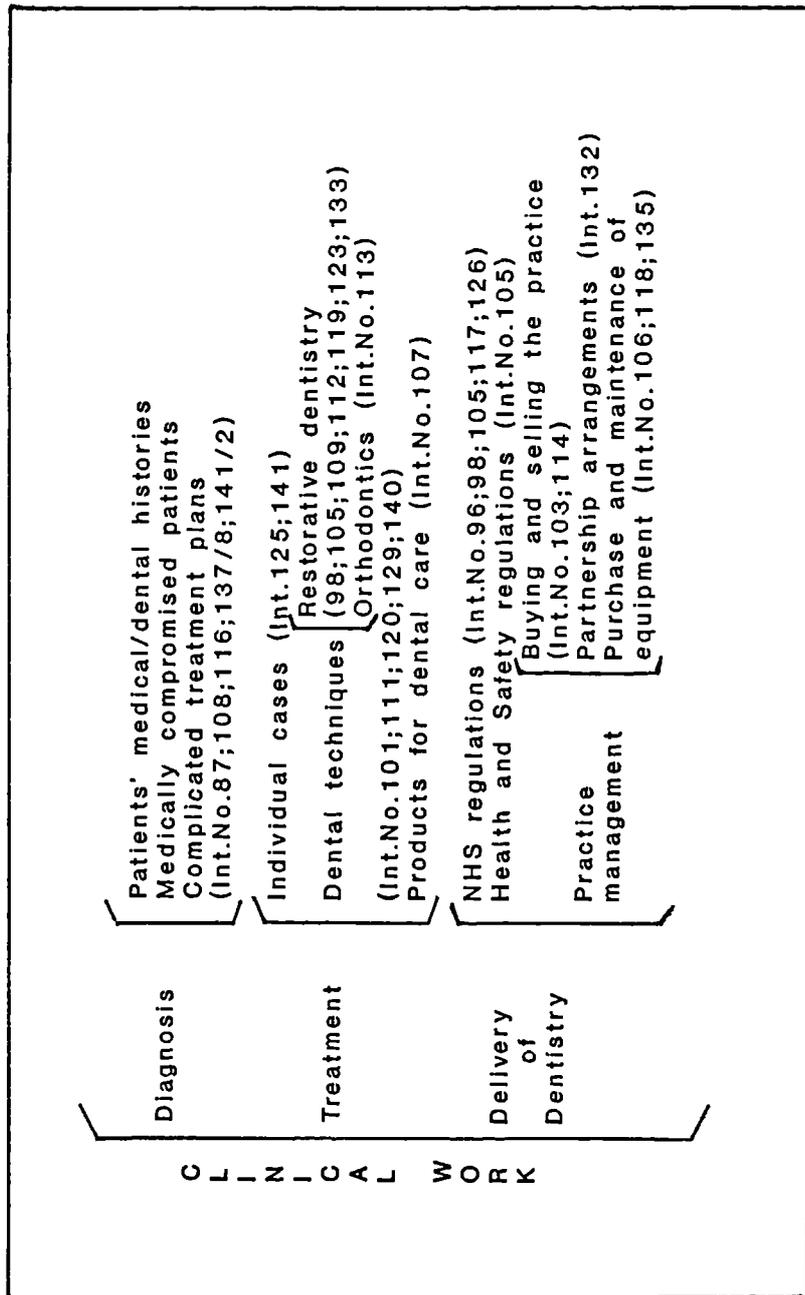
Figure 6.2: Conditions for information needs of general dental practitioners

'...if somebody comes with a medical condition I may not be familiar with, then obviously I'd have to look it up' (Int.No.116/Q.1).

'I had a patient who comes from...[a country of the EEC] *and she had a complicated medical history so I asked the local dental hospital for some advice. I sent her over there and they sent her back to me in order I can continue the treatment'* (Int.No.142/Q.1).

R: Usually complicated treatment plans rather than... [interruption] *routine tasks.*
I: Why do you think this happens?
R: Because I don't see the problem very frequently. Perhaps sometimes because of the way the health service works, it's better to get a consultant treatment plan, before applying for its approval. That's easier.
(Int.No.137/Q.3-4).

General dental practitioners seek information to complete the clinical history of their patients, to deal with medically compromised patients and to carry out complicated treatment plans.

Treatment itself represents a second group of situations that demand information (Int.Nos.98;101;105;107;109;111;112;119;120;123;125;129;133;140;141/Q.1). It is sometimes in the form of advice about a particular case:

'I think it is individual cases, individual treatment. That's where you need information, really, rather than the whole aspect of something'
(Int.No.125/Q.3);

or about products for dental care:

'I suppose the commonest thing is the [...] mouth wash that is available now, I would like to know more information on that so I knew what to recommend to patients' (Int.No.107/Q.1).

However, the most frequent situations are dental techniques in the field of Restorative Dentistry, the speciality that dominates general dental practice:

'Technical procedures. If there is something that you really don't know, you refer to the consultant' (Int.No.101/Q.3).

'Probably on new materials, for use on patients and that's I think basically because so many new things are coming on to the market nowdays that you have to keep up to date with what's going on because there is somebody trying to sell you a new material. So you ought to keep abreast with what's going on at that point' (Int.No.119/Q.3).

'It's a bit long and involved, but basically we etch or we stick fillings and for a long time we've been sticking the fillings to the enamel. Yes. And now we've started to stick the fillings to the root surfaces of the teeth, to the dentine and cement and I've been trying to find out which adhesives and fillings are compatible. This is all happened since I've qualified, you see...' (Int.No.123/Q.1).

'I think it is the materials, changing materials. Because they seem to be changing very quickly at the moment. There is a lot of progress being made particularly... you know... the composite materials and things' (Int.No.133/Q.3-4).

'...Regarding technical information of various products I do find that you use, you tend to use what is sent by them, particular people which are selling the products and obviously when you are wanting to weigh up which is probably the best system to use a material. They are obviously all biased and therefore is quite difficult to get an unbiased... thing. Well, they do at the hospital and various lectures but there again they don't always pick on exactly what you want' (Int.No.105/Q.1).

'I suppose the most recent one...was with the new porcelain veneers that have come out... to find out how to actually prepare and to cement veneers' (Int.No.112/Q.1).

'Basically any new technique that comes out. We've never done it, so we need to find out how to do it, to check the materials that come out [that] we haven't used. We need to know how to actually use the material as well' (Int.No.112/Q.4).

They need to learn new techniques and how to use new materials. At the same time they have to make decisions about which products they are going to use and whether to adopt certain techniques. This last aspect is linked to the third group of situations where general dental practitioners seek information: the delivery of dentistry.

Unlike all the other groups in the study, general dental practitioners are actively involved in the management of dental services, since they are actually in charge of their own practices.

The day to day management of the surgery presents plenty of instances in which information is necessary. For example:
buying and selling the practice:

'There are several ones [situations that require information]. *I've just bought a new surgery so that required information about it'* (Int.No.114/Q.1).

partnership arrangements (Int.No.132/Q.1) or purchase and maintenance of equipment:

R: I have actually...mainly trouble with lights and things like that.
I: Trouble with lights?
R: Yes, electrical.
(Int.No.106/Q.1).

or

'Whether or not to install a computer' (Int.No.118/Q.1).

However, the interpretation of the NHS regulations, as well as those of the Health and Safety Executive, constitute a major information problem for general dental practitioners.

'Quite often we need to send off forms to the Dental Estimates Board[4] *and occasionally there's information, conditions about terms of contracts which I want clarifying, so I ring up the Dental Estimates Board, just to clarify...'* (Int.No.98/Q.1).

'I think that understanding the regulations it's sometimes quite difficult... particularly regarding patients' charges and when they are written in such... as the usual official language it's quite difficult to sort out what they do mean. Very often we have to make enquiries or just sending off forms, you know, thinking have I interpreted correctly and then see whether they come back again with comments on and that seems to be very often the easy way to find out...I think yes...employment regulations or health and safety that sort of thing and there's such a wealth of information coming through your letter box that you don't always sift through it, so much is irrelevant and then you find that probably [you] *missed something that was very important'* (Int.No.105/Q.1).

'I think that the irritating day to day it's the rules and regulations of the Health Service. "Do you need approval for x, y or z?" or "Can I do such and such on somebody". Most of the time is that or organizing the patients for getting sent their forms for family income... Academic information obviously is hardly difficult at all' (Int.No.117/Q.3).

'I think the situation that commonly occurs really is to do with what is or isn't permissible under the NHS contract... [She leaves the room to fetch the file with all the guidelines and shows it to me] *Because the goalposts are always being changed and you have to keep up with what new regulations are allowed or not. That's the common area, where I would be looking for information'* (Int.No.126/Q.1).

The terms of contract are not clear. The text of the regulations is obscure. The regulations themselves keep changing. As a result of all that, dentists are constantly looking for information about the administrative side of the treatment they intend to deliver.

Virtually every aspect of their clinical work has got an information problem. Information about patients is not always readily available, specially in the case of patients having specialist hospital treatment, and without the full details of those patients' medical histories, the dentist cannot carry out dental treatment on them (Int.No.115/Q.3-5).

Information about drugs presents different problems, specifically the amount of information, and the pace of change:

'Medical and drugs histories I would say. Because I am not familiar with every medical condition and drug in the market' (Int.No.116/Q.3-4).

'I suppose different drugs that people take and their medical histories. They are changing all the time, the subject is changing what I learnt 15 years ago it's not necessarily what's on now' (Int.No.138/Q.3-4).

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[4]The Dental Practice Board.

The pace of change in Restorative Dentistry, particularly in the field of Dental Materials has an even more serious impact on the information needs of general dental practitioners (Int.Nos.98;107;110;124;133;135/Q.3-4):

> *'Because over the last ten years there has been an acceleration in the rate of change for new techniques and new materials'* (Int.No.135/Q.4).

> *'I suppose it's sort of lab and adhesive Dentistry, new materials that are coming out. Because they are fairly new products and we don't know very much about them all... the new product becomes available and I've not read anything about or whatever, you know, we don't know whether to use it or not'* (Int.No.107/Q.3-4).

This area of their work imposes on them a constant need to keep up-to-date. But this is only one aspect of their information needs. The other aspect is to obtain reliable information on clinical and research findings, i.e. independent research results that may support or not manufacturers' claims:

> *'Basically on very new materials, very new techniques which have come about. I suppose mainly because there you tend to get the spiel from the manufacturers, telling you how wonderful their properties and things like that, and it's always nice to have something backing it up. Obviously if all manufacturers are going to tell you their products are wonderful, I think that's the most difficult* [information]. *When you've got a lot of new materials or a lot of new things coming on to the market, it's getting sort of I suppose, what's the word?, learned back up to the claims the manufacturers are making and often that's difficult, because if it is a very new material then the research is still on going, the sort of neutral research other than that directly sponsored by the manufacturer. I think that's the most difficult to get hold of. I think that's a case when you have to take manufacturers' word for it and go ahead and use it how they suggest, until such times as anybody tells you any different or says "This isn't as good as they claim".'* (Int.No.119/Q.5).

Restorative Dentistry is not the only specialty presenting the general dental practitioners with information problems. Orthodontics is another one, but for quite different reasons:

> *'Probably because it* [Orthodontics] *is completely out on its own. We are not expected to know. Talking to specialists is very difficult. They are good at taking things out of your hands'* (Int.No.109/Q.5).

> *'As far as the Orthodontics goes, I mean, the teaching that we get in Orthodontics in the university is next to nothing. I've found that the consultants in Orthodontics in general don't want us to know a great deal about it. As far as they are concerned it's a post-graduate thing and they want us to keep our hands out of it'* (Int.No.108/Q.4).

> *'I think it is Orthodontics. Because I don't think it is very well taught. And I think that reading about it, it is very difficult to put it into practice. It's*

> a specialist's thing. Although we are expected to do a slight amount of it,
> it is not very well taught. And the information in books is not particularly
> well given out. That's the most difficult to come across. Journals and
> whatever normally deal with simple conservation procedures or new acid-
> etching techniques, etc., which are very easily laid out in picture form.
> Not being actually qualified for too long I've done all these techniques any-
> way, so that's not too difficult to follow. But I think Orthodontics is the
> most difficult. We must do a lot more work, postgraduate work. It's not
> something you can read about it, it's something you need to do on a course
> rather than...[reading]' (Int.No.125/Q.5).

Orthodontics unlike Restorative Dentistry is not a particularly dynamic dental
speciality[5] as a consequence there is no problem of information overload. As we can
see from their replies, it is a problem of access to information in terms of communi-
cation between general dental practitioners and specialists, that has its roots in the
undergraduate curricula.

Communication, both written and oral, is also the obstacle to obtain information
about the administrative side of their work:

> 'Information from the Dental Estimates Board[6], I suppose, especially the
> information which they do not want to give... [laugh]very often it's im-
> possible to speak to the person you want to speak to, at least from recent
> experience. Some other things are by statute only available through one
> particular route, that is by writing about a particular case and very often
> you need a sort of blanket idea of what's going on. But that's routine
> administration problems' (Int.No.118/Q.5).

> 'Most of the information is buried in...written, you know, very long-winded
> really, information which has been published over a series of years and it's
> never been updated into one overall properly indexed and cross-referenced
> file. It's been published as a series of editions over the years. Even when
> we store them all, it is very difficult to tell how... certain pieces of regu-
> lations have replaced others, things like that, so you end up with a mass
> of information in a book which is basically never written up-to-date... The
> problem is again getting anything on the phone or finding the right person
> to talk to. I tend again to deal with something like that according to having
> it in the surgery or by phone' (Int.No.111/Q.5).

Whatever channel of communication is used, it is time consuming; as one inter-
viewee put it: '...it's never immediate and it always seems to take some time to get
to the end product' (Int.No.141/Q.5).

Despite all the difficulties, general dental practitioners do not perceive their infor-
mation needs as impossible to satisfy:

> 'I don't suppose any information is difficult to find if you make the effort'
> (Int.No.113/Q.5).

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[5]See Talking for seeking information about new developments in Orthodontics page 190.
[6]The Dental Practice Board.

'To be honest this is not going to suit your questionnaire. I think we devise ways of getting most of the information we need really' (Int.No.123/Q.5).

These ways of finding information are in principle the same basic strategies used by the other groups of dental professionals. As it is the case with each group in the study, general dental practitioners adapt these strategies to the particular characteristics of their information needs.

6.3 The information-seeking behaviour of general dental practitioners

6.3.1 Basic strategies

Reading

General dental practitioners receive regularly a great number of publications from professional journals to advertising literature:

> *'You tend to find that we get a lot of journals through the post and we tend to read about things before you actually do it rather than the other way. So you don't usually find a problem occurs and then go and read about, it's quite the other way round'* (Int.No.110/Q.1).

This steady flow of printed literature through the letter box brings them constant information about techniques, products, equipment and political issues of the profession. The information comes directly to them, either to their surgeries or their homes, and it comes even before they actually start seeking for it (See Figure 6.3).

They read mainly dental magazines such as: *Dental Practice, The Probe* or *The Dentist* or general dental journals like *British Dental Journal* or *Dental Update* (See Table 6.8 and Table 6.7).

They read also a variety of journals that cover from General Dentistry to medical and dental specialities like *Otolaryngology* or *Orthodontics*. However, these journals are linked to isolated cases and this is the reason why so many journals were taken by single individuals (See Table 6.7). For example, one interviewee (Int.No.136) works part-time as a general dental practitioner while reading for a medical degree and his future speciality will be *oral and maxillo-facial surgery*. He reads regularly *The British Journal of Oral and Maxillo-Facial Surgery; British Medical Journal; Clinical Otolaringology and Allied Sciences; Journal of Cranio-Maxillo-Facial Surgery; Oral Surgery, Oral Medicine, Oral Pathology;* all these titles are relevant for his future speciality and they are not related to his actual current but temporary job as general dental practitioner. Another one is a specialist orthodontist (Int.No.96) who receives the *British Journal of Orthodontics*. A third one is married to an oral surgeon and reads the journals to which her husband subscribes: *British Journal of Oral and Maxillo-Facial Surgery; British Medical Journal; Journal of the Royal Society of Medicine* and *Nature*.

Except for special cases, general dental practitioners read general dental magazines and journals geared to information relevant to the technical and political aspects of their practice, and only occasionally they show interest in more specialized topics.
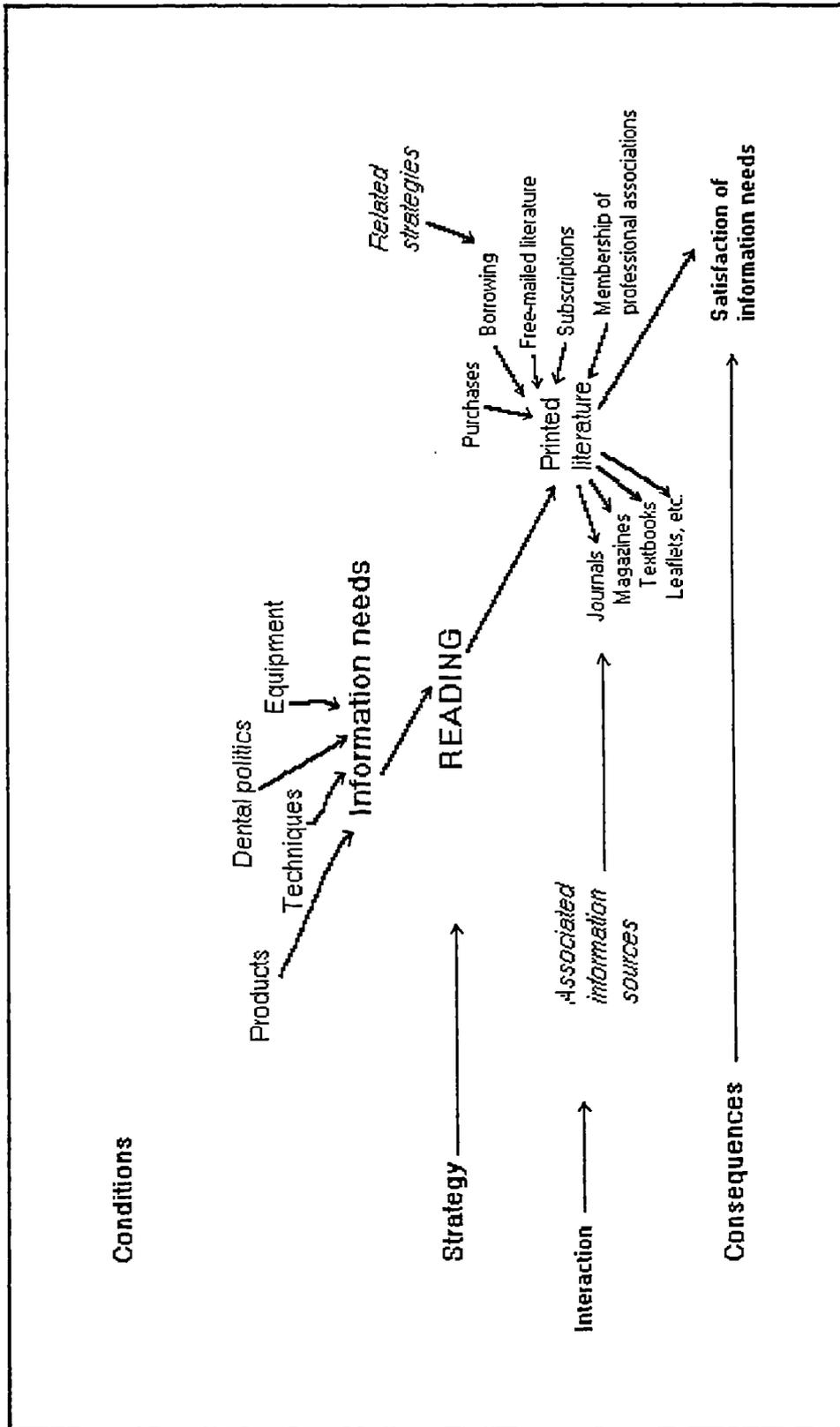
Figure 6.3: **Reading as a basic strategy for general dental practitioners**

Free mailed literature is the most frequent way of obtaining their reading material (for example: *Dental Practice* or *The Probe*). Another way is the membership of professional associations (for example: *British Dental Journal* is included in the membership of the British Dental Association). They may borrow publications from colleagues or read the journals received by their husbands or wives, but it is very seldom that they borrow books and journals from the library. As we will see later **Using the library** is a strategy rarely implemented by the general dental practitioners. As they read mainly dental magazines free of charge, it is not surprising that only 12 of them subscribe to journals (See Table 6.9). However, there is a small group (11) that uses textbooks for reference purposes and again in this case they buy themselves the textbooks that they use (See Table 6.7 and Table 6.9).

Reading is always associated to information sources that are directly accessible and available. Because of that the strategy is easy to implement and it does not demand any effort:

'Because I can just sit at home and read it. I don't have to make any effort at all' (Int.No.107/Q.11).

'Because they [the journals] *are readily available, they are pouring through the letter box all the time and I never have time to read them'* (Int.No.111/Q.11).

'Journals are available, it's easier to pick them up rather than phoning people. It also depends on what information I need' (Int.No.114/Q.11).

'Probably because I've got my own textbooks available at home and in the practice, textbooks in the practice, so they are readily available' (Int.No.116/Q.11).

R: It's usually the latest publications that have come through the door, a journal or a newspaper or sometimes it may be information such as what is the comparative cost of A and B in which case it will be one of the catalogues from one of the companies. That's the first, the second course of action it will be discussing with the other partners.
I: Why do you prefer this source?
R: Because they are always handy. There is always one lying about. I can walk into the next room now and put my hand straight on one (Int.No.120/Q.9-11).

'It is readily available, it is sent to me through the post to my home address, probably about half a dozen journals a month, something like that. It's only two of them that I get, that are very, very up-to-date and I reckon they are probably as the leading journals: British Dental Journal and Dental Practice' (Int.No.129/Q.11).

R: Depends on what information is on but usually looking through the journals and things, because I tend to have quite a few of them.
I: Why do you prefer this source?
R: Just because they are at hand at home and I've got them if you know what I mean' (Int.No.133/Q.9-11).

Table 6.7: **Journals and magazines read by general dental practitioners**

Journals and Magazines[a]	GDPs	
	%	()[b]
British Dental Journal	71.8	(28)
Br.J. of Oral & Maxillo-Facial Surgery	5.1	(2)
British Journal of Orthodontics	2.6	(1)
British Medical Journal	5.1	(2)
Clinical Otolaryngology...	2.6	(1)
Community Dental Health	2.6	(1)
Dental Advertiser	15.4	(6)
Dental Practice	82.0	(32)
Dental Update	38.5	(15)
The Dentist	43.6	(17)
FDI Newsletter	2.6	(1)
The General Dental Practitioner	25.6	(10)
International Endodontic Journal	5.1	(2)
Journal of Cranio-Maxillo-Facial Surgery	2.6	(1)
Journal of Dental Research	2.6	(1)
Journal of Paediatric Dentistry	10.3	(4)
Journal of the American Dental Association	2.6	(1)
Journal of the Royal Society of Medicine	2.6	(1)
Nature	2.6	(1)
Newsletter (Women in Dentistry)	2.6	(1)
Oral Surgery, Oral Medicine, Oral Pathology	2.6	(1)
Practice Management	2.6	(1)
The Probe	66.7	(26)
Quintessence International	2.6	(1)
SAAD Journal	7.7	(3)

[a]Data from Q.14;22 and 23.
[b]Values in () indicate frequencies.

Table 6.8: **Reading by type of document**

Type of document[a]	GDPs	
	%	()[b]
Magazines	89.8	(35)
Journals	77.0	(30)
Textbooks	28.2	(11)
Other	12.8	(5)

[a]Data from Q.14;22 and 23.
[b]Values in () indicate frequencies.

Table 6.9: **Origin of the literature**

Origin[a]	GDPs	
	%	()[b]
Free mailed	89.8	(35)
Membership	61.5	(24)
Borrowing	41.0	(16)
Subscription	30.8	(12)
Purchase	28.2	(11)

[a]Data from Q.14 and 26.
[b]Values in () indicate frequencies.

Table 6.10: Collections of dental literature

Type of collection[a]	YES		NO	
	%	()[b]	%	()
Personal collections	69.2	(27)	30.8	(12)
Practice's library	56.4	(22)	43.6	(17)

[a]Data from Q.29 and 30.
[b]Values in () indicate frequencies.

General dental practitioners read the literature that comes to them. If at some point they need specific information they go back to that literature to find out about the particular topic:

> 'I think basically because you keep them at home, it's sort of something just at hand and...that's the first sort of thing I tend to look for because it's handy. I've got them at home and often you read something in the magazine and when you think about it you say "Oh! Yes I remember reading something about that..." and...that way I can sort of get back to it fairly quickly' (Int.No.119/Q.11).

This retrieving process is done at random. It relies on what they may remember, or they simply go through whatever they have got at hand. Although 69.2% collect the materials that they receive and 56.5% keep a small collection of books and journals at the practice (See Table 6.10), all this literature is barely organized.

Book collections are small (10 to 20 books) and do not require any special organization (Int.Nos.87-142/Q.30); but that is not the case with journals, reprints or cuttings. Some of them keep the publications in piles and on shelves, in no special order and sometimes only temporarily (Int.Nos.90;96;98;107;108;117;123;133;135;140;141; 142/Q.29):

> R: I suppose magazines I keep them in a pile for a while, sort them out once a year something like that. I don't keep them for ever, I end throwing them away.
> I: And the books you buy?
> R: The books I keep them obviously.
> I: And you keep them at home or...?
> R: I've got a small library at home and upstairs here [the practice]'
> (Int.No.107/Q.29).

> 'In a pile by the side of the bed. We actually put some of the Updates [Dental Update] in folders in case there is something that we want to do. Then you forget about them and you can't find what you want to do anyway once you've filed them up' (Int.No.108/Q.29.1).

> 'I actually pile them on a bookshelf at home; it's not actually organised' (Int.No.142/Q.29.1).

Some others keep selectively information that might be useful in the future. They tear articles off the magazines and file them. But *'filing'* means simply to put them somewhere, all together (Int.Nos.87;99;105;106;109;114;118;124;138/Q.29):

R: I keep course material and I keep selected articles from other literature. I feel like I may want to refer to it again.
I: How do you organize these materials?
R: Badly [laugh] I don't to be honest (Int.No.99/Q.29).

R: If something interesting is in them, I cut it out and keep it. Normally I throw away because it gets too clumsy.
I: How do you keep the cuttings that you...
R: I just stick them in my...where I do all my paper work. I keep all in one big room all together (Int.No.106/Q.29).

R: I don't keep it all. I keep all the Quintessences. I take the British Dental Journals apart and keep the papers which I think I want. I very rarely keep the others. There may be the odd article that I take out but I don't keep them as a whole.
I: How do you keep the papers that you tear from the British Dental Journal?
R: I keep them in a rack file at home, that's all (Int.No.118/Q.29).

Sometimes a basic date order for the journals is followed (Int.Nos.119;129/Q.29.1) and a personal subject subdivision is used for the cuttings and reprints (Int.Nos.103; 111;112;136/Q.29):

'I store them in date order and I... specific articles on topics that I really want to keep out because I think they may be useful and relevant to what I'm actually doing. I may actually remove them from the magazine and keep them in an specific file so I know where they are. But I tend to rely on my memory, having seen an article when I remember... when I need it, I go back and read back.' (Int.No.111/Q.29.1).

Dentists in general practice do not keep alphabetic or subject indexes of their collections. Despite some sort of organization, as the case described above, **Reading** is a strategy that relies on the dentists' own memory for the purpose of seeking information.

Talking

This strategy is constantly used by general dental practitioners, because it adapts to any situation. Talking about patients, new developments and practice management is part not only of the everyday work but of the everyday life of the general dental practitioner (See Figure 6.4).

Despite the fact that work in a general dental practice seems routine and repetitive and that very serious cases are referred to the dental hospital (Int.Nos.106/Q.17.2;110/ Q.17), there are many instances between these two extremes, when the dentists seek information to deal with a case by means of talking to a colleague:

Figure 6.4: **Talking as a basic strategy for general dental practitioners**

'Bridge work, Orthodontics, attrition, full denture patients, especially the elderly, people with complicated medical histories' (Int.No.102/Q.17).

'Anything that either they [other colleagues at the practice] or I think it's unusual and we would need a second opinion' (Int.No.114/Q.17).

'Difficult cases from both the point of view of complicated procedures that I need doing and also difficult cases... in fact difficult management' (Int.No.119/Q.17).

'Something that's unusual, just to confirm my diagnosis. It is usually a question "What do you think of this?". It may be something as simple as "Have a look at this X-ray, What do you think?" to something more complicated like, you know, "with such a model how would you do it?".' (Int.No.120/Q.17).

'Basically the ones where there is... a vast amount of work that requires doing and the best way of going about it, where there's a total lack of dental concern' (Int.No.125/Q.17).

'They are basically three types one is complex restorative cases and the second one would be Orthodontics and the third one is usually extractions under general anaesthetics' (Int.No.135/Q.17).

Another situation when **Talking** is used as a strategy to obtain information concerns the adoption of innovations. But in this case the information needs of general dental practitioners are focused on the feasibility and demand for new developments in three main fields: *dental materials, restorative techniques and equipment.* They are less interested in developments that are not operational at practice level (for example Implants).

The main issue regarding practice management was the new contract. At the time of the interviews (February-June 1990), the *'new contract'* was been discussed nationally and not surprisingly it was the main topic of conversation amongst general dental practitioners[7]. Because of the particular period of the interviews both the implications of the new contract and those of the NHS reforms put forward by the Government in its White Paper[8] seemed to dominate their conversations about the managerial side of the practice. However, **Talking** is a strategy to obtain information about other professional issues, such as disciplinary action taken by the General Dental Council, staffing and patients claims.

Colleagues, either from the same practice, from another practice or from their own family are always the information source for this strategy. (See Figure 6.4). The typical pattern of interaction is informal conversations that occur spontaneously, without previous planning :

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[7]The Government through the Department of Health has introduced new General Dental Service Regulations from 1 October 1990. These new regulations are called the 'new contract' and they establish the terms of contract between general dental practitioners and patients for the provision of treatment under the National Health Service.

[8]WORKING for patients...(1989).

> *'I will discuss a case where I'm having a diagnostic problem or where I feel*
> *a technique, that I'm relatively inexperienced in, might be useful, I would*
> *like another opinion, whether it's a good idea* [...] *I go and dig my colleague*
> *out. I have colleagues as you know. I'm in a practice with other dentists*
> *and I have a couple of other practices that I know well and I can talk to very*
> *regularly ... There's no fixed meeting, it's ad-hoc as required'.* [He adds
> regarding new developments:] *'There's no formal arrangement, when I or*
> *one of my colleagues... feels that there is something we want to talk about,*
> *that we've come across and we want to chat over'.* [Regarding professional
> issues in general:] *R: The professional issue is the new contract, it's in*
> *everybody's mind.*
> *I: How often do you discuss about it?*
> *R: Every day!* [Laugh] [...]
> *I: How do these discussions take place?*
> *R: Just whenever we meet colleagues... dentists talk about Dentistry. I*
> *don't know whether any other profession is as colloquial as ours'* [Laugh].
> (Int.No.99/Q.17-19).

If it is necessary to make decisions about the organization of the practice or to
discuss important professional issues, formal meetings may be an alternative:

> *R: We had had a chat recently, we had a meeting within us actually last*
> *week, just within us in the practice about some new materials which we'd*
> *been offered again by one of the reps* [dental trade representative] *who's*
> *been here.*
> *I: How often do you discuss about new developments?*
> *R: Usually we're meeting once a fortnight.* [There are regular meetings of
> all the dentists at the practice to discuss whatever is relevant at the time.
> Regarding other professional issues, he adds:] *R: I suppose it depends on*
> *what's currenlty happening at the time, at the moment the new contract is*
> *a very big issue, so it's been spoken about quite frequently, sort of several*
> *times a week.*
> *I: How do these discussions take place?*
> *R: Again with colleagues in the practice, with colleagues outside the prac-*
> *tice and there was a meeting at the Hallamshire Hospital last Thursday for*
> *everyone within Sheffield to air their views.*
> (Int.No.129/Q.18.1;19.2).

But on the whole **Talking** either to a member of the family, at work, socially
or less frequently at conferences or meetings, is an unplanned strategy that can be
implemented any time when at least two dentists meet each other:

> *R: Well of course as my wife...* [she is a dentist as well as his partner] *just*
> *literally when I come home, play bridge eleven o'clock at night have a cup*
> *of tea and a fag and she starts saying "Oh so and so something". We, of*
> *course, do it casually, we don't have a meeting.*
> *I: Do you discuss with other colleagues?*
> *R: Not a lot, no, not a lot, we keep... as we are both at the same practice*
> *we tend to keep... you know, things... in the same...* [practice].

(Int.No.106/Q.17.3).

[Regarding patients] *R: Usually... my wife is a dentist as well, so we often... sort of... although we cut it, keep it actually to a minimum. We usually have a rule not to talk too much shop at home.*
I: Do you work together?
R: No. So it's within the practice and also with my wife. [Regarding new developments he adds:] *'Very informally, sort of casual, over lunch or coffee break or something like that, unless there is a specific issue, we all make the point of getting together, we may go to the pub or something like that'* (Int.No.119/Q.17.3;18.3).

[Regarding patients:] *'We pop into each others' surgery and ask the questions.'* [Regarding new developments:] *'It's either at the Dental School or my father's a dentist, because he tends to go on a course every Thursday, so what he's learnt he tends to talk about, we'll sort of talk about it together'*
(Int.No.125/Q.17.3;18.3).

'We never actually sit down and have a big discussion but you know at lunch time or when we are getting in the morning we may say "have you heard about...".' (Int.No.108/Q.19.3).

'It's casual, but I mean we are working full-time and we are a busy practice but we are there all the time and... if issues come up then we discuss them we don't set aside time necessarily' (Int.No.141/Q.19.3).

'Just informally amongst the dentists that work in the practice or when we meet other dentists socially' (Int.No.123/Q.18.3).

R: Whenever a group of dentists gets together it starts, they start talking shop.
I: How do these discussions take place?
R: Informal, in the pub... I don't particularly like going to group meetings and so on... I suppose I have an aversion to anything like a committee or meeting.
(Int.No.117/Q.18.3).

'On an informal bases [with colleagues in the practice] *Not very often at a postgraduate lecture* [...] *Just on an informal bases. We don't actually have clinical meetings to a set timetable. If we are both not doing anything or* [if] *it's the lunch break, then we are chatting to each other'*
(Int.No.115/Q.17.3;18.3).

Talking as well as **Reading** is perceived by general dental practitioners as an easy and straightforward strategy. They also find it fast and convenient in the sense that does not demand a great deal of effort like **Enquiring**:

R: When I am looking for information... I ask my husband [He is a dentist]
I: Why do you prefer this source?
R: It's easy.
(Int.No.102/Q.9-11).

'Asking partners first of all, it's the quickest way of getting information if they know something about it that I don't and secondly with two or three of us on the go then, we are going to find the information a lot quicker, two heads are better than one' (Int.No.112/Q.11).

R: You are not going to like this, my husband [laugh]
I: Is he a dentist?
R: Yes. You see, he works full-time and I only work part-time and it's only just recently that I've started working a lot more. So I tend to go to him first and he usually answers things. Not very women lib, is it?
I: Why do you prefer this source?
R: It's quick, it's convenient and it's not very often that he doesn't come up with an answer.'
(Int.No.123/Q.9-11).

R: Probably the very first is... my wife is a dentist as well and we talk a lot about in the house and with my colleagues here [the surgery]...and friends as well.
I: Why do you prefer this source?
R: It is easier to talk to people.
(Int.No.140/Q.9-11).

R: My husband (laugh) [Her husband is an oral surgeon, who has got access to a university library]
I: Why do you prefer this source?
R: It's convenient, you don't have to go out of your way to do anything.
(Int.No.138/Q.9-11).

Moreover **Talking** to a colleague may avoid relying on **Enquiring** or **Reading**:

'My partners [...] Because as a first source I would prefer to ask my colleagues whether they know something first before trying to find that information elsewhere' (Int.No.126/Q.9-11).

R: My associates [...] We have frequent discussions because two out of three of them have got hospital appointments.
I: Why do you prefer this source?
R: [it is] most convenient. It is easier to ask and get an answer than go and read which I don't mind doing anyway. (Int.No.131/Q.9-11).

R: My daughter [laugh] until she's qualified. [The daughter is an advanced student at the local dental school]
I: Why do you prefer this source?
R: At the moment I do because that is the easiest way, obviously she's got

all the new techniques at her fingertips as well, you see, apart from having the... you know, she's got the qualified experts... that has made an awful difference.
(Int.No.105/Q.9-11).

But **Talking** has another value: it gives them feedback; as one interviewee said: *'You put your own ideas and get their own ideas'* (Int.No.109/Q.11). It provides them not only with factual information but with the practical experience of somebody who has been in a similar situation:

'It's accessible; it's easily understandable. I'm dealing with somebody who knows the subject with hands on approach' (Int.No.113/Q.11).

R: It's quick...
I: Anything else?
R: It's practical knowledge as well because if it is let's say a technique I'm asking about it's probably something they've done and had experience of it. They can point the difficulties, the personal difficulties they had with those things, whereas maybe you don't get that viewpoint from a literary level.
(Int.No.115/Q.11).

Finally it is a distinctive characteristic of this strategy that whoever they talk to is not only a colleague but somebody they know at personal level. Mutual trust is a pre-condition for this strategy:

'Other dentists in the practice. Then people who are easily accessible on the phone such as: doctors, technicians, other dentists outside the practice. Getting hold of people at the dental hospital is not so easy, mainly because you cannot pick a phone up and say "Hello so and so, what do you think about it?"... and also because unless it's someone you actually know as a friend, they would not give you any advice over the phone and commit themselves. Whereas another dentist that we know might say: "Well if you want so and so I would do this", knowing that we've got the intelligence to take that information, look at it in the light of our own patient saying "Yes this is right or no it's not", whereas at the Dental Hospital they simply are not going to commit themselves because they think I might use it without that' (Int.No.108/Q.9).

Enquiring

This strategy is used routinely by general dental practitioners to find out information about patients and different aspects of the daily running of the practice (See Figure 6.5 and Figure 6.6).

In the first case, the patient himself is the initial information source, where the enquiry usually starts. As a consequence of the introductory dialogue with the patient, the general dental practitioner decides whether it is necessary to obtain further details about the patient's condition or to confirm the information passed by the patient. This second step takes the general dental practitioner to contact medical colleagues (both general medical practitioners and hospital specialists). The aim is to complete
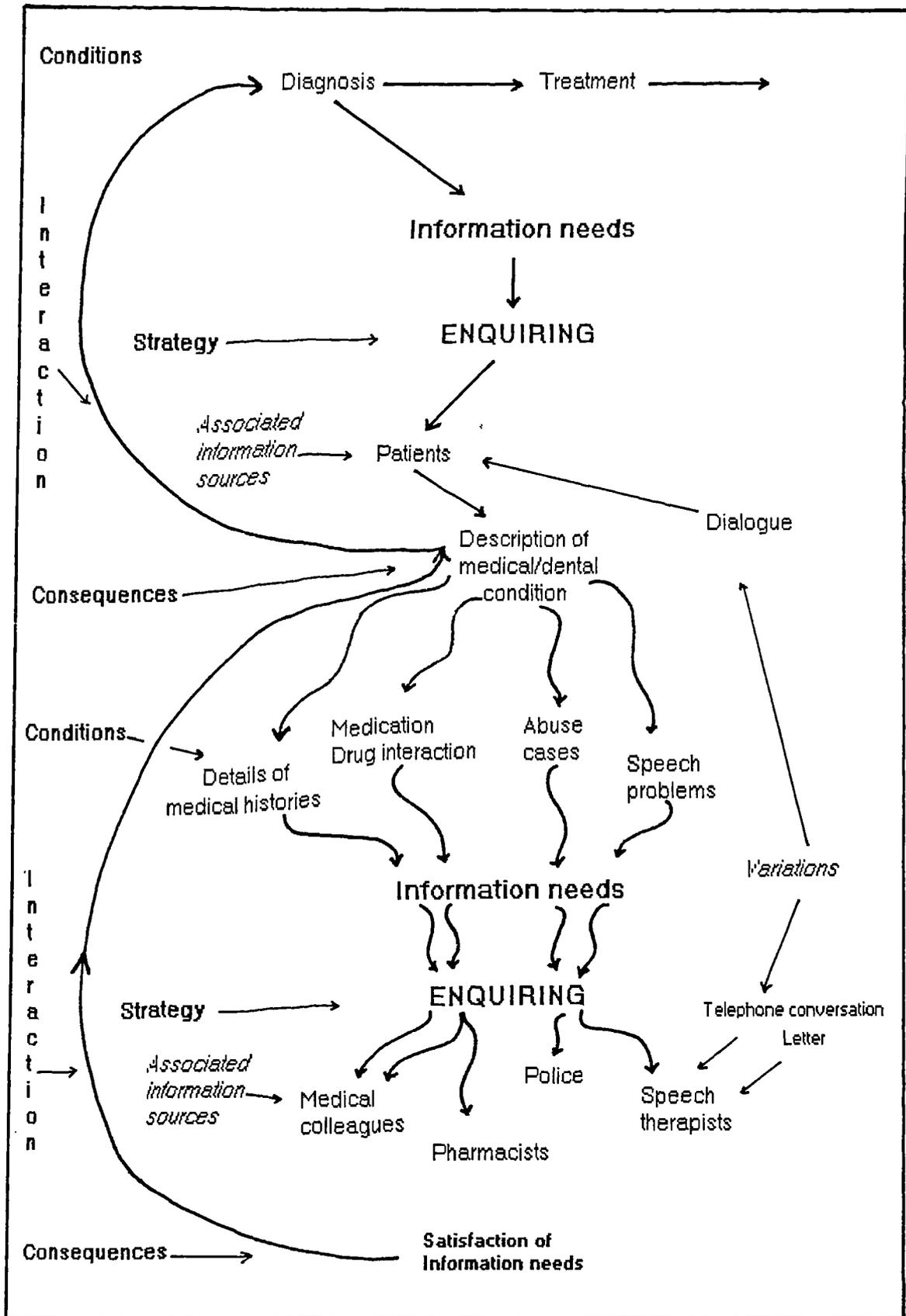
Figure 6.5: Enquiring as a basic strategy to seek patients' information - General dental practitioners
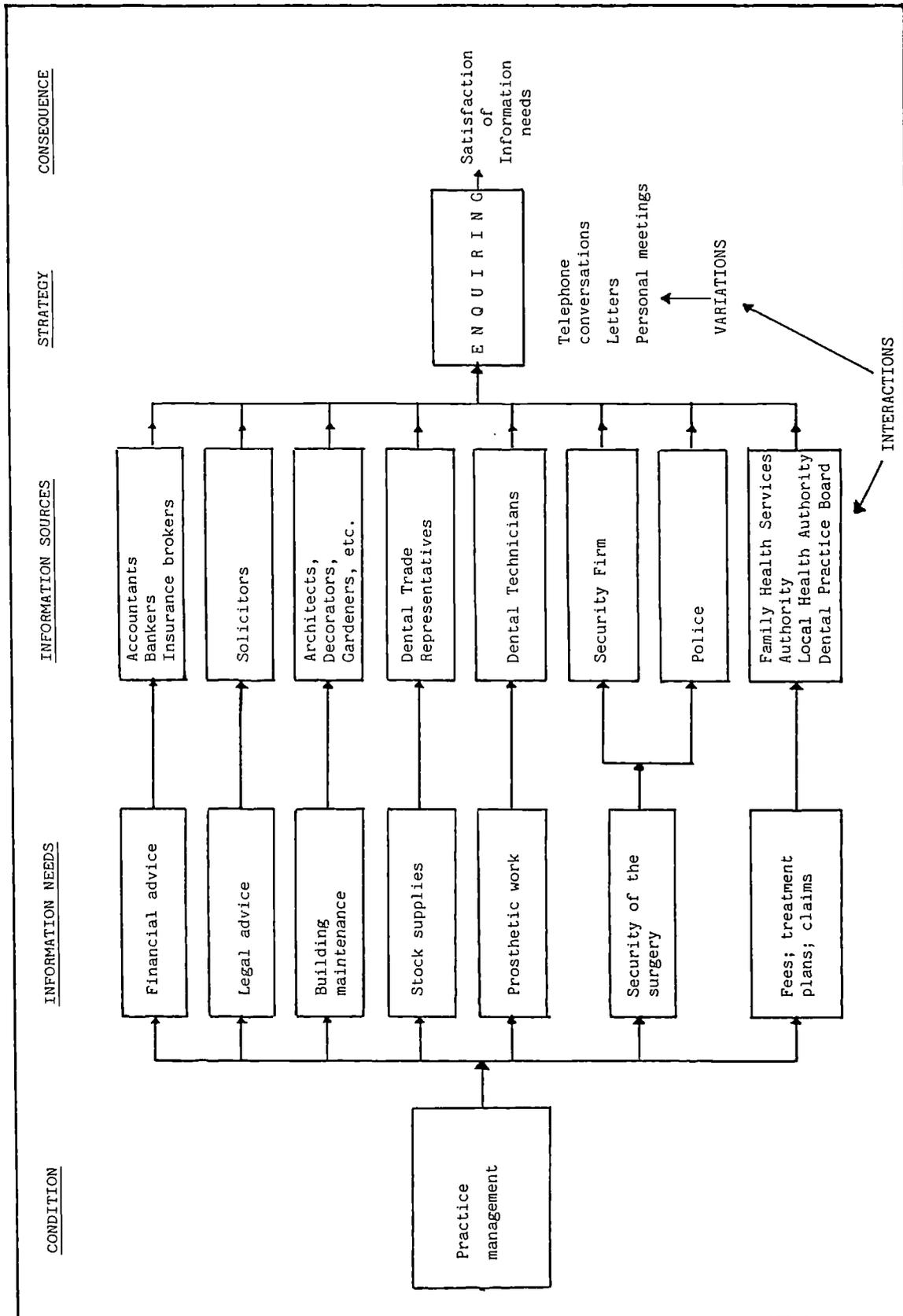
Figure 6.6: Enquiring as a basic strategy to seek management information - General dental practitioners

the description of the patient's condition. It is usually associated with medication and drug interaction problems. In this particular situation, pharmacists may be an alternative information source. Also, it may be associated to special cases such as children with speech problems and then the contact with speech therapists is necessary or to abuse cases, where contact with the police is required. Other patients with special needs are not dealt with by general dental practitioners; this is the reason why enquiries about patients are mostly solved by contacting the patient's doctor. The preferred channels of communication are conversations over the telephone or by letters.

In the second case, the day to day business of the dental surgery leads them to enquire about financial, legal and security aspects of the practice, maintenance of the building, stock supplies, prosthetic work, fees, prior approval for treatment plans and claims. Enquiries are directed to expert people for each specific situation: accountants, solicitors, dental technicians, etc. Routine enquiries are made from three organizations: Family Health Services Authority[9], Local Health Authority, and Dental Practice Board[10], to deal with the administrative side of patients treatment. Other organizations are contacted less frequently, for example: security firms or police regarding security of the premises. All these enquiries are made over the telephone, followed by letters or personal meetings.

Individuals are the preferred information source for 'Enquiring' rather than organizations. (See Figure 6.7).

At the same time general dental practitioners seldom make enquiries from information services direct or inderectly related to Dentistry (See Figure 6.8).

The only exception is the Local Health Authority, which includes several local departments of the health service involved with the complicated system of payment for treatment under the NHS[11].

The findings of Duxbury & Leach (1981)[12] are confirmed again: general dental practitioners do not use drug information centres. Duxbury & Leach suggested as the possibilities that the dentists were not aware of these services or that they used fewer drugs than their medical colleagues. This study reveals that the general dental practitioners identify medication and drug interaction as situations likely to require information[13]. General dental practitioners need drug information when they receive a patient and make a diagnosis, but they do prefer **Enquiring** from the general practitioner, **Talking** to a colleague or **Reading** from a reference book[14] as the means of gathering that information.

Enquiring is a strategy selected when a specific piece of information is required from a defined individual: the patient, the medical practitioner, the pharmacist, the solicitor, etc. In many cases it is unavoidable and it cannot be replaced by any other strategy, but general dental practitioners never perceive **Enquiring** as easy, straightforward or effortless. They do not place in **Enquiring** the implicit trust that they do on **Reading** and **Talking**, where they feel that everything that is worthwhile to know will eventually appear in the dental press and that their colleagues will always

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[9]Family Practitioners Committee at the time of the interviews.

[10]Dental Estimates Board at the time of the interviews

[11]See page 61.

[12]See page 30.

[13]See page 62.

[14]See **Patterns** ... page 102.
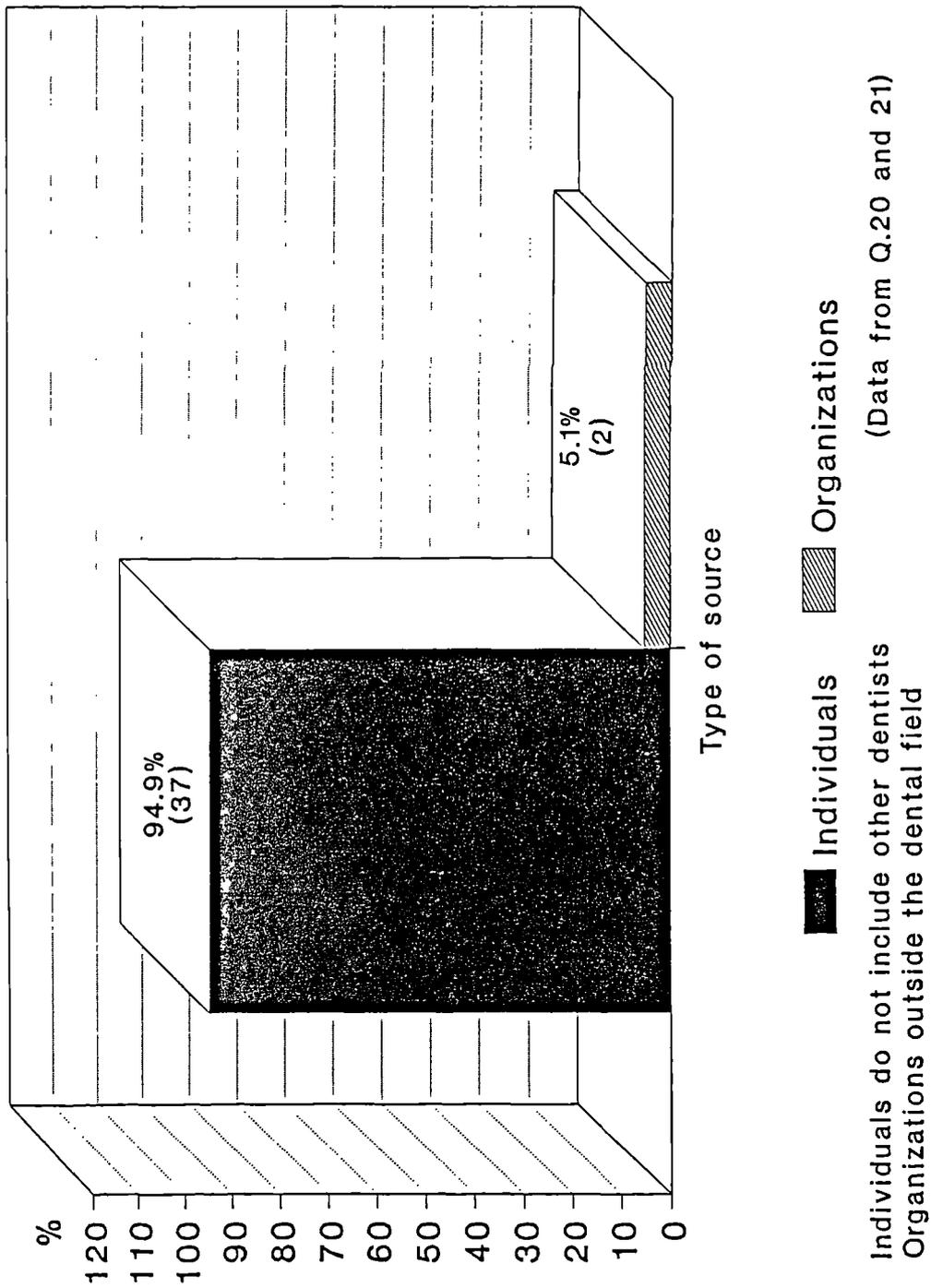
Figure 6.7: Information sources for Enquiring - General dental practitioners
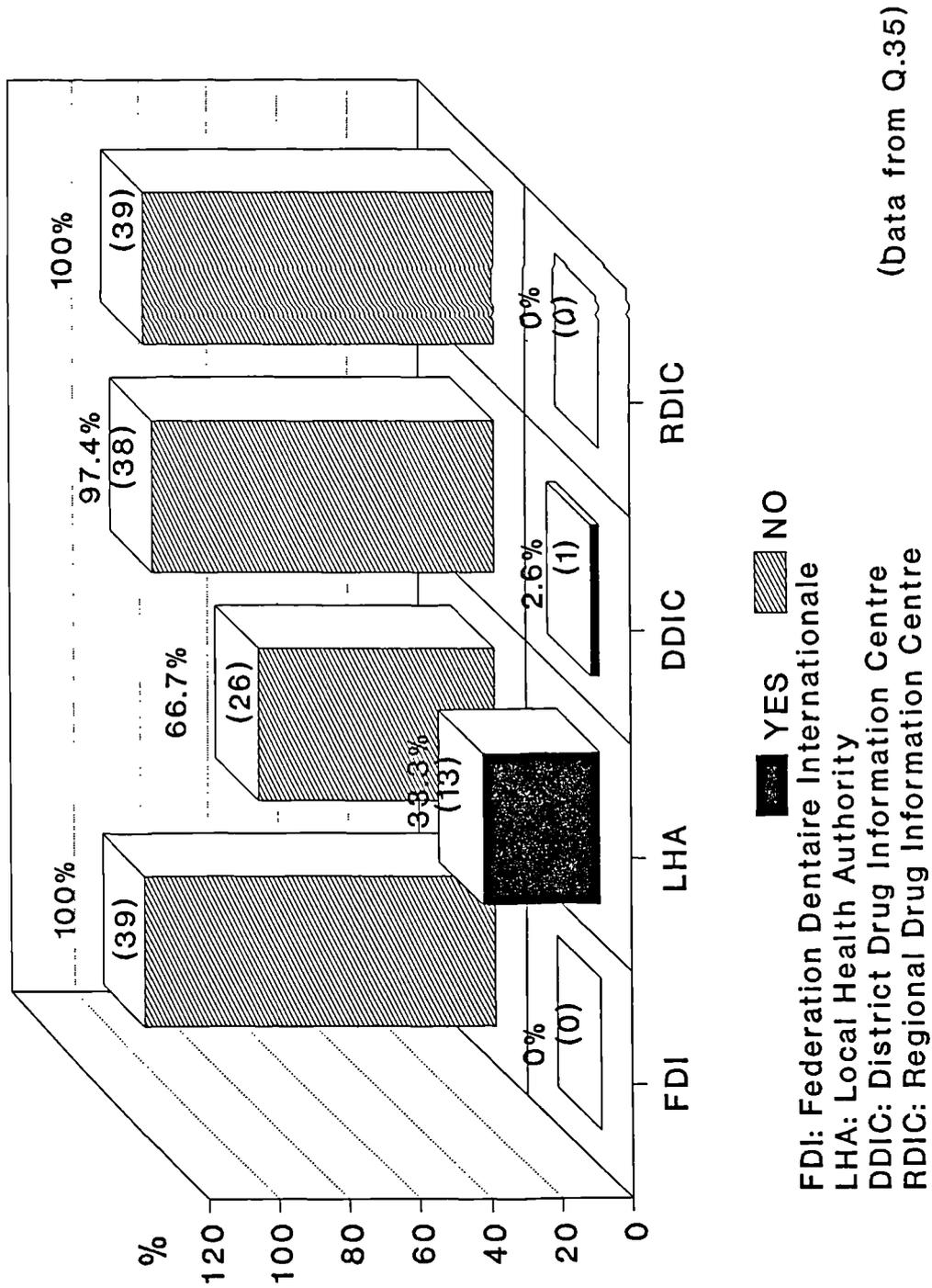
Figure 6.8: Use of information services by general dental practitioners

come up with some reply.

Attending/organizing continuing education events

This particular group of general dental practitioners is not actively involved in teaching or lecturing[15], as a consequence the interviewees only attend continuing education events (See Figure 6.9).

The main events attended by general dental practitioners are:

- Postgraduate courses on new techniques and materials in Restorative Dentistry. Other topical issues such as cross-infection are likely to be preferred.

- Conferences, lectures or evening meetings on topics of general interest.

- Manufacturers' presentations and dental trade fairs for dental products and equipment.

On the whole, postgraduate courses are attended more frequently than conferences; non-attendance at conferences is comparatively higher (33.3%) than non-attendance at courses (15.4%) (See Table 6.11).

Cost and time are common factors for non-attendance of either courses or conferences. But in addition to these factors, the general dental practitioners seem to find conferences less useful, either because conferences are too theoretical or too political:

'Most meetings and conferences seem to work on a more theoretical level than I am interested in' (Int.No.87/Q.16.4).

'Well conferences are more... discussion of policy than what you'll actually be doing and I'm more interested in finding out the information, seeing how things are made'. (Int.No.110/Q.16.4).

They prefer the practical approach of courses designed to train in specific topics, and so it is not surprising that some dentists have defined conferences as downright *'boring'* (Int.Nos.107;131/Q.16.4) or *'a complete waste of time'* (Int.No.90/Q.16.4).

Presentations of products and demonstrations of equipment are attended sporadically, when a re-equipment of the surgery or a change of products for restorative techniques are being considered. It is also the case that these events sometimes run in parallel to courses and conferences, so it is not possible to measure them independently.

Local venues for both courses and conferences are favoured; but for those who attend these events regularly, distance does not seem to be a problem in itself. In fact more than 50% of them travel outside Sheffield for both conferences and meetings (See Table 6.12).

Attending is related to contacts with dental trade representatives (a variation of Enquiring). The latter are a possible source of enquiry about events run by manufacturers, such as presentations of products, demonstrations of equipment or even courses. It is also associated with membership of professional associations. Actually the pattern of membership of professional associations is similar to that of journals and magazines (See Table 6.7 and Table 6.13). General dental practitioners prefer

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[15]See page 58.

Table 6.11: **Frequency of attendance at continuing education events**

Event[a]	Non-attendance		Irregular attendance[b]		Regular attendance[c]		Intensive attendance[d]	
	%	()[e]	%	()	%	()	%	()
Courses	15.4	(6)	20.5	(8)	35.9	(14)	28.2	(11)
Conferences	33.3	(13)	15.4	(6)	18.0	(7)	33.3	(13)

[a]Data from Q.15 and 16.
[b]No specific frequency or less than once a year.
[c]At least once or twice a year.
[d]More than twice a year.
[e]Values in () indicate frequencies.

Table 6.12: **Willingness of general dental practitioners to travel**

Event[a]	Sheffield[b]		Region[c]		U.K.[d]	
	%	()[e]	%	()	%	()
Courses	42.4	(14)	27.3	(9)	30.3	(10)
Conferences	46.1	(12)	23.1	(6)	30.8	(8)

[a]Data from Q.15.2 and 16.2.
[b]Attendance at local events only.
[c]Attendance at events in the Trent Region and the North of England, including Glasgow and Edinburgh.
[d]Attendance at events anywhere in the United Kingdom.
[e]Values in () indicate frequencies.

Table 6.13: Membership of professional associations

Associations[a]	GDPs	
	%	()[b]
American Dental Association	2.6	(1)
British Association of Oral and Maxillo-Facial Surgeons	2.6	(1)
British Association of Orthodontists	2.6	(1)
British Dental Association	51.3	(20)
British Dental Health Foundation	2.6	(1)
British Endodontic Society	2.6	(1)
British Paedodontic Society	12.8	(5)
British Society for the Study of Orthodontics	2.6	(1)
British Society of Medical and Dental Hypnosis	5.1	(2)
Federation Dentaire Internationale	2.6	(1)
General Dental Practitioners Association	20.5	(8)
Sheffield Orthodontic Study Circle	2.6	(1)
Society for the Advancement of Anaesthesia in Dentistry	7.7	(3)
Women in Dentistry	2.6	(1)
No membership	35.9	(14)

[a]Data from Q.12.
[b]Values in () indicate frequencies.

associations that cover the whole field of Dentistry: the *British Dental Association* (51.3%) or the *General Dental Practitioners Association* (20.5%). They join special dental associations exceptionally[16]. Some general dental practitioners are still involved in the use of general anaesthesia or other special anaesthetic techniques and this is the reason for their membership of the *Society for the Advancement of Anaesthesia in Dentistry* (Int.Nos.90;106;141/Q.6.3;13); while others with a special interest in Children's Dentistry have joined the *British Paedodontic Society*, which has a local branch in Sheffield (Int.Nos.105;119;132;133;/Q.13).

Finally 35.9% of the general dental practitioners do not belong to any dental association. We have seen that the membership of professional associations is related to two strategies **Reading**[17] and **Attending**. However, the fact that general dental practitioners may not be members of any association cannot be considered as an obstacle for implementing these strategies. They can still subscribe to journals or receive free magazines, and at the same time they can attend events organized by the dental hospital/school, the dental companies or even those organized by the associations they do not belong to, since these events are opened to all members of the profession.

[16]See page 65.
[17]See Figure 6.3.
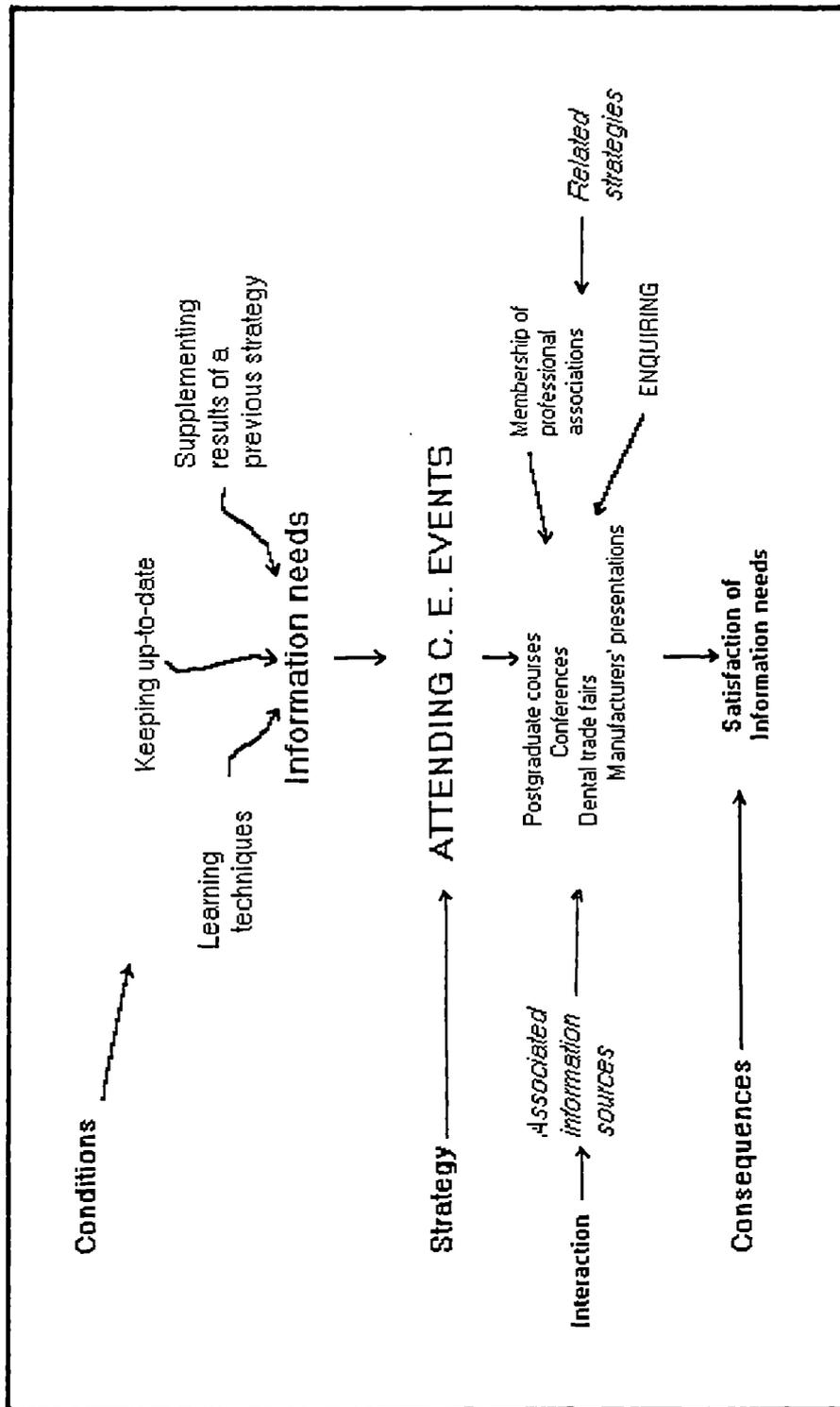
Figure 6.9: Attending/organizing continuing education events as a basic strategy for general dental practitioners

Attending continuing education events is typically used for keeping up-to-date with new developments, specifically for learning techniques or acquiring more detailed information. As it lacks the immediate response provided by **Reading**, **Talking** or **Enquiring**, it is not used as an initial strategy and it is always implemented in combination with some other one.

Watching

This strategy is associated only to the use of audiovisual materials and in the particular case of general dental practitioners to the use of videos (See Figure 6.10). Although dentists in general dental practice discuss a great deal with their colleagues about patients, possible treatment, products and techniques, none of them mentioned observing another colleague as a way of seeking information.

They acknowledge that watching either a real life demonstration or a video is the best way of showing a technique. Also, videos are useful to describe unusual situations that can arise in the clinic (heart attacks, anaphylactic shocks, etc.) because this sort of information is not available from a book (Int.Nos.87;98;125/Q.46). However, they do not actually perceive audiovisual materials as irreplaceable (Int.Nos.87-142/Q.46) and 31% of them do not use audiovisual aids at all (See Figure 6.11).

One possible reason is that some dentists may not have a video (for example: Int.Nos.125;138/Q.27). Another reason is that they do not find this strategy as useful as others:

> I: Do you use audiovidual materials?
> R: No, not really. We get the odd video sent through the post. But only if it is sent through I just have a quick look. It's not one of my favourite ways of finding out.
> (Int.No.140/Q.27).

But an even more important reason is that they are not acquainted with documents in audiovisual form as they are with documents in printed form:

> 'I don't know... I don't really know what kind of information is available on audio-visual form. When I was student I used to look at audiovisual stuff and it was very instructive, very easy to use, but not since then, no. Apart from the tapes that the Government sends around now on... it sent one on Fillings, one on Orthodontics and one on Radiation, they are the only audiovisual aids I have used' (Int.No.90/Q.46).

In fact the use of this strategy is dependent on government and commercial initiatives. The Department of Health, the British Postgraduate Medical Federation, a video magazine: *Dentistry; the magazine for the general practice team* and the dental schools in collaboration with the audiovisual department of the respective university (for example: at Sheffield University, the School of Clinical Dentistry and Sheffield University Television) are the main producers of dental videos. In some cases, the videotapes are sent free of charge to every general practice, in others, some general dental practitioners have been randomly chosen and receive the videos free:

> R: There is one [a video] that's coming about roughly once a month, and that's really good ... I try to look it up, it's just called "Dentistry Videos".

I think basically it is sponsored by Colgate and they do... they are banks spielling out information. I think it is sponsored by them. But they are really good, they really covered a range of things you want to know about and the important thing is they give you a questionnaire. They ask you whether you enjoyed it and b what you know, what you want to find more about it, so they are really good. I'm honest I get more information from [them] *than I do from reading.*

I: Do you pay for them or do you get them free?

R: No, what happened was when the video started up they sent... they chose a certain number of practices and sent them out to them free on condition, I think, that you filled in the questionnaire. So whenever they get feedback from you, they keep sending you the video. So now you can... the practice gets one but you can individually subscribe and get it for yourself. But we are partners so we use the one that comes for the practice. And we also get the odd video from the postgraduate medical services or something. They do the odd ones and usually they tend to be more specific subject ones.
(Int.No.123/Q.27).

However, the example above is an exception; usually the general dental practitioners do not know how the videos arrive and they have given very vague replies:

I: Tell me about the videos.

R: What subjects are they on?

I: Yes.

R: All sorts of things, composite materials, posterior composite materials, root canal therapy...

I: How do you obtain them?

R: I don't know how it originated, something was sent to my husband and he subscribed to it and along they came, so I don't know where things actually...
(Int.No.102/Q.27) [She did not know how she and her husband were getting the videos and did not conclude the reply.]

'They come to the practice. I think they receive them free, I haven't questionned' (Int.No.99/Q.27.2).

R: I think yes, we've been given some videos, I used videos before.

I: In which occasion did you use them?

R: Most of them, they came through the post and others, just got it from colleagues. There is HIV information and associated sterilizing methods.
(Int.No.96/Q.46).

'Well we've been sent them for a long time, Dental Practice, Dentistry or whatever and then the Postgraduate Medical Federation, they've just started sending them out...' (Int.No.105/Q.27.2).

I: Do you use audiovisual materials?

R: Yes.

I: Which ones?

R: Videos occasionally.
I: How do you obtain them?
R: Some magazine I've forgot how it is called.
(Int.No.113/Q.27).

I: Do you use audiovisual materials?
R: Yes.
I: Which ones?
R: Video tapes that I get them sent.
I: Do you get them sent by who?
R: I can't remember I think it is the British Dental Health Foundation but
I'm not sure. [He subscribes to a video magazine but he could not give
any details.]
(Int.No.114/Q.27).

R: I was thinking. We do occasionally receive videos, which we get sent
free.
I: By who?
R: I'm not sure to be honest. I think it is.. I'm not sure who is responsible
for sending them.
(Int.No.107/Q.27).

'I get the Dental Video and also get the one that is from... Dental Health
Foundation? [he is not sure about the name] *and a couple of national*
ones as well, the Section 63... the ones that come through the post.
(Int.No.111/Q.27).

The replies suggest that they watch videos because these audiovisual aids ar-
rive free of charge at the surgery. They are not particularly interested in them
and moreover, they do not know where these videos come from or when or what
they are going to receive. They very seldom borrow these materials from colleagues
(Int.Nos.96;109;133;137/Q.27.2) and even more rarely do they use the audiovisual
facilities at the university library[18] (Int.Nos.116;136/Q.27.2).

Using the library

Previous user studies in Dentistry have indicated that: i) the general dental practition-
ers make little use of library services (Walker, 1976); ii) they do not seem aware of the
existence of such services (Ashin, 1983); iii) the library ranks as the least frequently
used information source (Ashin-Strother, Lancaster and Gardiner, 1986). The results
of this study do not contradict any of these conclusions, since 41% of the general
dental practitioners that I interviewed, are current users of libraries (See Figure 6.12).
None the less there is still a large enough group using libraries, especially if we bear
in mind that: i) dental collections are usually part of medical university libraries that
are not primarily intended for this category of users; ii) the only non-university dental
library is held by the British Dental Association in London, 160 miles from Sheffield.

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[18]See Using the library

Base: users of audiovisual materials only (27)

96.3% (26)

3.7% (1)

3.7% (1)

0% (0)

Other AV materials

Videos

Overhead projections

Slides

(Data from Q.27.1)
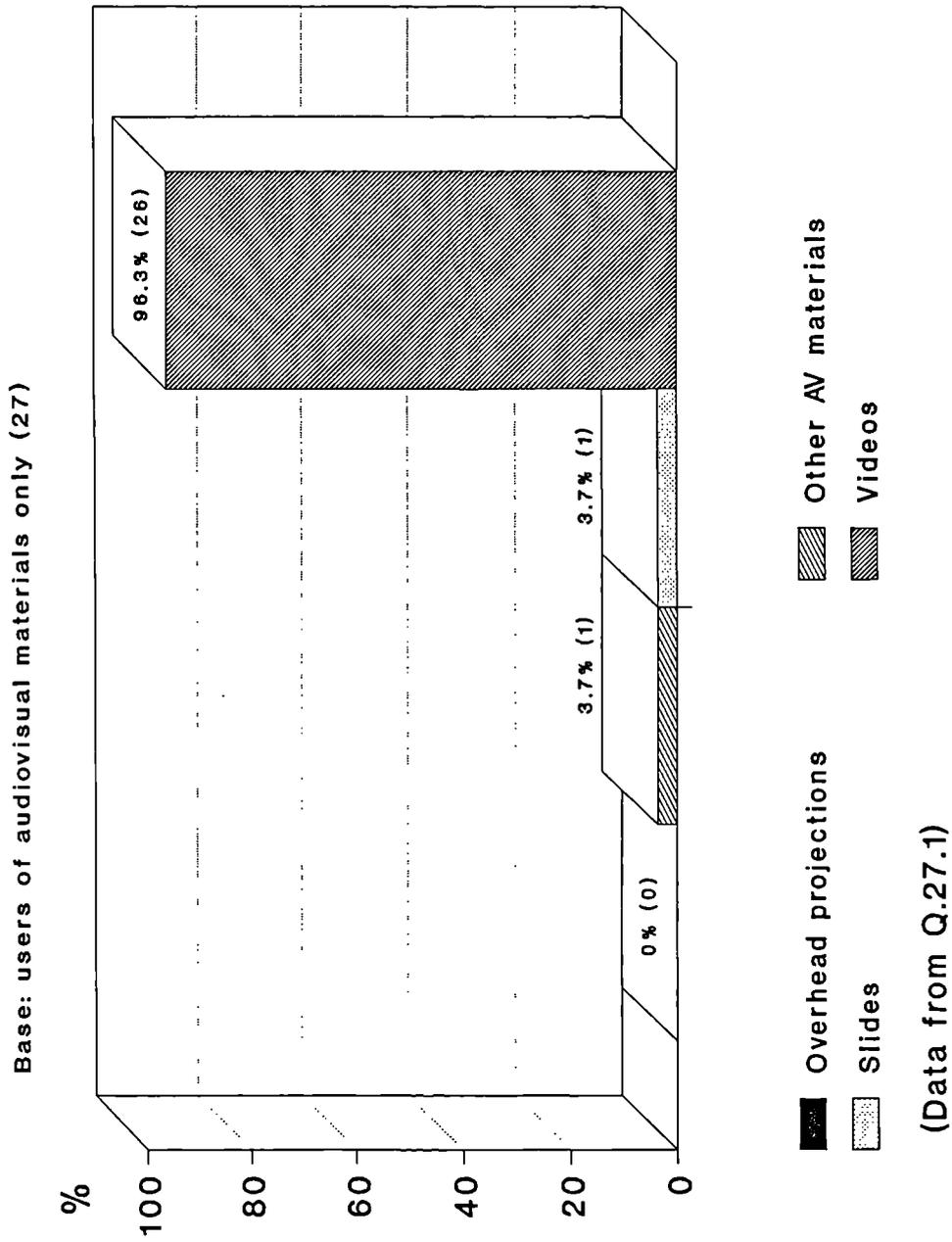
Figure 6.10: **Types of audiovisual materials used by GDPs**

NO 31%
(12)

YES 69%
(27)

(Data from Q.27)
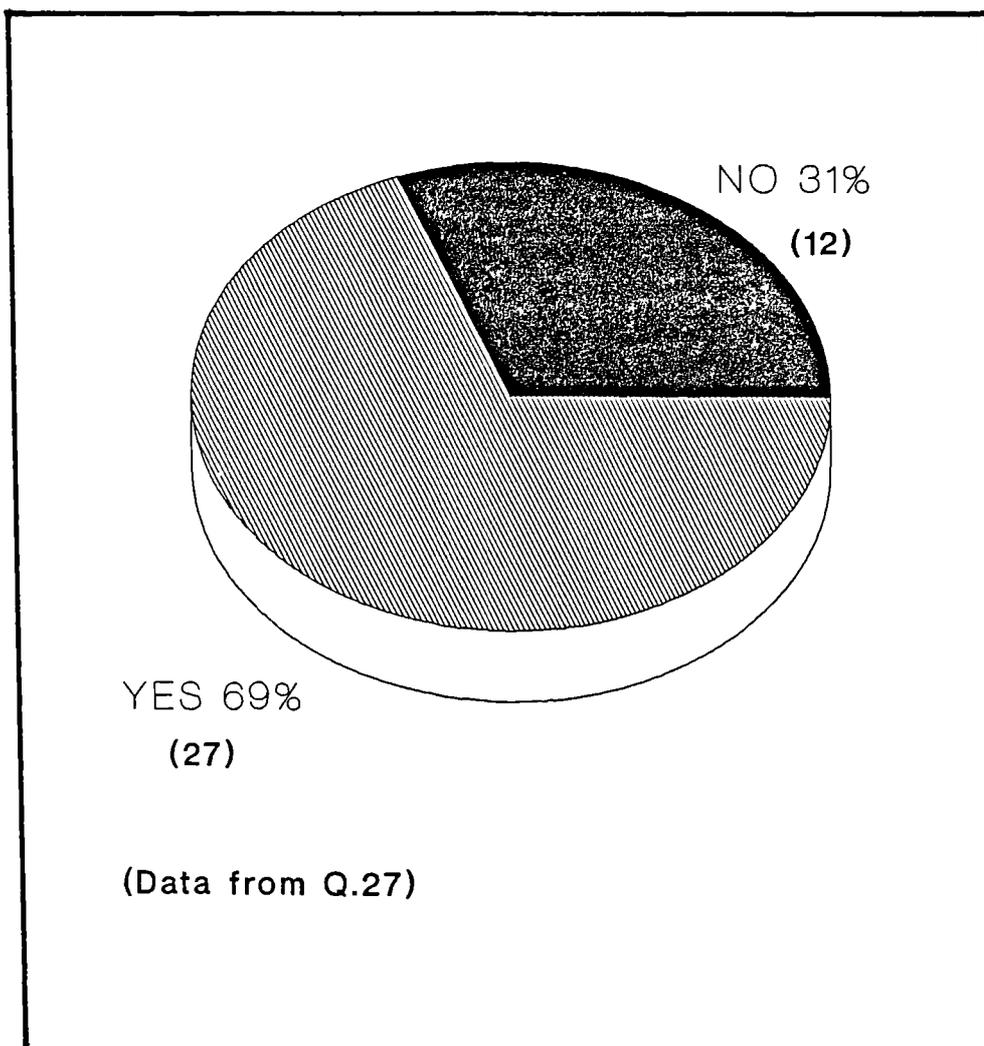
Figure 6.11: **Use of audiovisual materials by general dental practitioners**

YES 41%

(16)

NO 59%

(23)

(Data from Q.32)
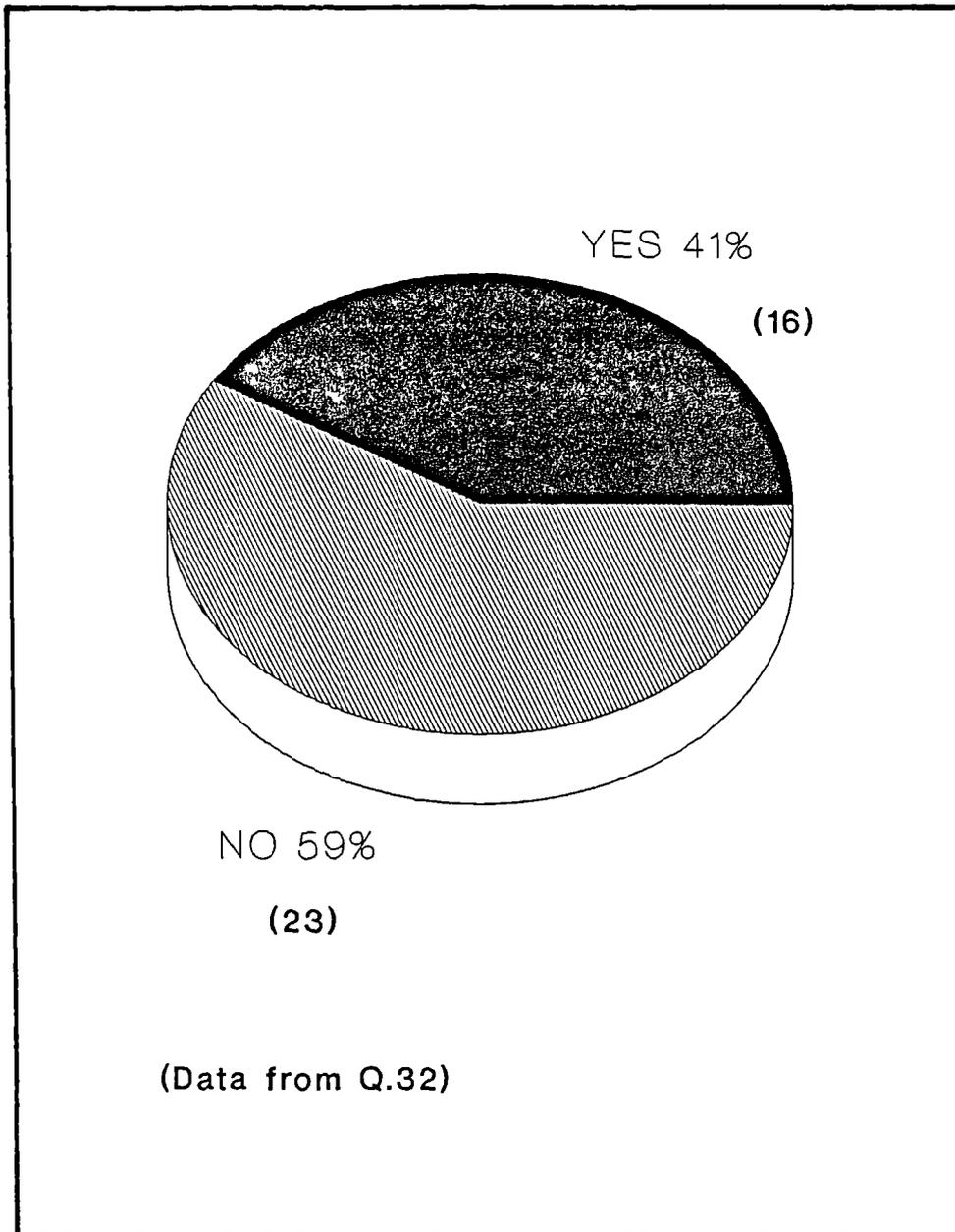
Figure 6.12: **Current use of library services by general dental practitioners**

While **Reading, Talking, Enquiring, Attending...** and **Watching** rely on sources that are equally available to any group of dental professionals: literature, colleagues, audiovisual materials, courses, etc., **Using the library** depends on library services that are either remote or not specifically designed for general dental practitioners. This is one reason why this strategy is less used. The detailed analysis of the replies given by the two groups – the library users and the non-library users – will reveal another one: unlike **Enquiring, Using the library** can be substituted by other strategies.

Those who use libraries prefer the Medical and Dental Library of Sheffield University, based at the Royal Hallamshire Hospital (HHL) (See Figure 6.13). But only three of them are active users with a currently valid library ticket, the rest of them use the library for reference purposes. Since they do not borrow or request on-line searches they do not need a library ticket and therefore they are not registered as active users. Another interesting feature is that 71.8% are graduates from Sheffield University[19], as such they are entitled to an external library ticket. At the same time, because all of them work under contract with the Family Health Services Authority, they are also entitled to use the HHL as NHS staff. However 38% used the HHL only while they were undergraduates or working at the dental hospital and 28% never registered as users. This last group includes dentists who graduated from other dental schools and some dentists who graduated at Sheffield University before 1982, when the dental collection at the dental hospital was definitively transferred to the HHL (See Figure 6.14).

The interviewees found it very difficult to describe what services of the library they used or what they did when they went there, partly because they did not frequently use it and could not remember an example in detail and partly because they did not command the technical jargon. They referred to the *"microfiche"*, the *"book"*, the *"computer"* or the *"CD-ROM"*, which meant: the microfiche catalogue, the *Index to Dental Literature*, the on-line catalogue and the CD-ROM version of Medline respectively. Some of their replies were just a sentence but in other cases a more extended dialogue was possible. Despite this limitation the replies reveal certain patterns of use and explain why this strategy has such a narrow application:[20]

> *R: Nothing very specific comes to mind but when I haven't got a journal which I sometimes want to refer to, then I go to the library and find it out and read what I want to read or bring the journal home and read it at my leisure.*
> *I: Do you use any other service of the library?*
> *R: Besides I haven't used it lately. I used to use it before, like the lending, videos and things like that.* [He worked at the dental hospital.]
> (Int.No.96/Q.33).

> *'To look through dental journals'* (Int.No.98/Q.33). [He could not actually tell how he selected the journals. He read the journals in-situ and took notes if he wanted. He did not use other services of the HHL.]

---

[19]See Table 6.2.

[20]The following transcriptions are their replies to Q.33 and my notes made during the interview are indicated in [...].

*'References, get lost, ask the librarian, find the book and read it. Sometimes
I photocopy something'* [One source for the initial references is the "Index
to Dental Literature" that he uses.] (Int.No.101/Q.33).

[The respondent was studying for a Master of General Dental Surgery and
had got past examination questions to work on. He went to the library to
find out the information he needed for these questions. But he could not
describe what he actually did, how he looked for information once he was
in the library. He said that he read in situ, made photocopies and borrowed
on his wife's ticket. He did not use the "Index to Dental Literature", and
he did not request any on-line search.] (Int.No.103/Q.33).

R: Trying to find out about Occlusion I went to borrow books.
I: Did you use any other service of the library?
R: No.
(Int.No.109/Q.33).

*R: Well.. when I was writing essays for my course I wanted to research a
few papers, so I went and borrowed a few papers.*
I: It was your postgraduate course? [21]
R: Yes.
I: What services of the library did you use?
R: It was the microfiche... [catalogue] *there was no computer* [on-line
catalogue] *then... and whatever is called...?*
I: The CD-ROM...?
R: Yes. Not in the university library.
*I: Did you borrow...? What section did you use? Did you use the book
collection or the journals? Did you borrow books or did you read them
there?*
*R: No, I never borrowed books, I read them there. I actually used the...
what is it called?. Not the journals or anything... the social what you
may call it reports that came out... the social services reports and census
reports... that come out every five years.*
I: Did you photocopy?
R: Yes.
I: Have you ever requested interlibrary loans from the library?
R: No.
(Int.No.116/Q.33).

*R: I was looking for an article on... again. I think it was prevention of
cross-infection in relation to hepatitis and HIV infection and just wanted
to have a copy of an article that had appeared in a journal. I had been to
a lecture and they quoted this journal and I just wanted to have a look at
it by myself so I went to the library, got the journal and actually had a
look at it.*
I: What did you do? Did you have a copy or did you just read it there?
R: No, I just... that one, in that particular instance I just read it there.

---

[21] He registered for a postgraduate degree in 1989 and read for only one term.

Normally, if I cannot take the time, then I photocopy.
I: Do you use any other services of the library?
R: I haven't use for a long time, I mean, sort of use interlibrary loans but
I have used in the past.
(Int.No.119/33).

R: Basically just when I want to read some information they have, when
I want to read an article.
I: And what do you do then?, ... you go and read there, you borrow or you
make a photocopy?
R: I just read there.
I: Do you use any other services of the library?
R: No.
(Int.No.125/Q.33).

I: Do you use any library in relation to your work?
R: Only very rarely I use the one at the Hallamshire [HHL], but that's very
rare.
I: When was the last time that you used it?
R: About six months ago.
I: Can you describe the situation for me?
R: That was looking up... I wanted to look up for a medical syndrome I'd
heard of.
I: And why you were looking for that?
R: A patient just mentioned this name to me that I'd never heard of, so I
just thought I would look it up, it was a sort of rare syndrome.
I: How did you find the information?
R: O.K.
I: How?
R: I just looked in one book... a textbook, looked it up, I didn't use the
computers [Medline in CD-Rom], I just looked it up and went from there.
I: Do you use any other services of the library?
R: No.
(Int.No.133/Q.32-33).

'*If it is a particular topic that I'm interested in, say I've been to a course*
then I'll write to the BDA[22] *library and ask them, if they can provide me*
with any recent material on the particular subject. I've also got a booklist
so I can send for a particular book if I want to' (Int.No.135/Q.33).

'*If I'm writing an essay or an article, I use it for references, I use the*
"*Index Medicus*" *to get journals' articles*' (Int.136/Q.33). [He borrows
books, requests interlibrary loans and makes photocopies. He has not
used the "Index to Dental Literature" since he was undergraduate but he
has requested Medline searches.]

R: Just to read... if I've seen any reference to any interesting paper, or...
not necessarily related to work but...

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[22]British Dental Association.

I: Do you use any other... what do you do when you find a paper...?
R: Probably read it there... occasionally photocopy.
I: But usually you read there.
R: Yes.
I: Do you use any other services of the library?
R: I haven't needed to. No.
(Int.No.138/Q.33).

R: I would say to look up something I want to find out, a topic. I don't have that much need to go, because it is usually in the journals that I keep. I also have all the textbooks from being undergraduate.
I: What do you look at: textbooks or journals?
R: Usually textbooks.
I: Do you use any other service of the library?
R: No. I sometimes watch videos that are there.
(Int.No.140/Q.33).

[She had used the HHL eight months before the interview.] *R: And that was actually to view one of the videos that they are using for instruction of the students an up-date version of crown and bridge work.*
I: Do you use any other services of the HHL?
R: No. I managed to view another video that same day. [A video on management of diabetic patient.]
(Int.No.141/Q.33).

R: I wanted some information on certain sort of equipment, whether it worked or not basically.
I: How did you find the information?
R: I went to... there is a book, there isn't?
I: The "Index to Dental Literature"?
R: That's right.
I: So?
R: Ultrasonics on root treatment. I got the books out.
I: Books?
R: The journals.
I: What did you do then?
R: I just photocopied them.
I: Have you used any other services of the library?
R: No.
(Int.No.142/Q.33).

[She used the library to try to find out about a particular medical condition because of a personal interest and not because of her job as a dentist[23] Regarding the latter she said]: *R: The problem is... if there is something that you are so unsure about it that you need to go and look it up in the journals then it is something that you don't have actually to deal with it in the practice.*

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[23]The first part of the reply is not transcribed to prevent the identification of the interviewee.

Table 6.14: **Formal literature searches**

Source[a]	YES		NO	
	%	()[b]	%	()
Index to Dental Literature	15.4	(6)[c]	84.6	(33)
On-line databases	5.1	(2)[d]	94.9	(37)

[a]Data from Q.38 and 41.
[b]Values in () indicate frequencies.
[c]Interviewees have used the "Index to Dental Literature" at least once during the last five years.
[d]Interviewees have requested at least one on-line search during the last 10 years.

I: Do you use the library for any other services? [No reply] *Have you used it?*
R: No.
(Int.No.108/Q.33).

Using the library is a strategy implemented when their information needs are caused by postgraduate studies (Int.Nos.103;116;136/Q.33), when they look for a specific document (Int.Nos.96;98;101;119;125;138;141/Q.33) or when they need information on a specific topic (Int.Nos.108;109;133;135;140;142/Q.33) (See Figure 6.15).

The usual pattern is the scanning of journals or textbooks to find the article or the topic that they need. If they do not have time to read at the library, they may photocopy what they are interested in. Borrowing is not important, this is why most of them use the library without having applied for a library ticket. In the specific case of the British Dental Association Library, access is by post. The user may request by letter or telephone and the library lends materials that are mailed anywhere in the United Kingdom. But this pattern of use, that is, using the British Dental Association Library is exceptional because it is a service only offered by that library and also because only one interviewee out of 20 who are members of the British Dental Association[24], is a regular user of its library.

Formal literature searches, either manual or on-line[25] are seldom done by the general dental practitioners (See Table 6.14). As a consequence interlibrary loans are not regularly requested.

In most cases they are using the library in the same simple, straightforward way in which they seek information from other sources. This implies that using the library is a strategy likely to be selected if: i) the general dental practitioner is familiar enough with the library to use it informally, i.e. going directly to the shelves, as they use their own collections[26]; ii) the general dental practitioner has got enough time to spare and in this case distance from the library may be a deterrent and iii) the information cannot be obtained in any other way. **Using the library** is a

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[24]See Table 6.13.
[25]When this study was designed the HHL did not have the CD-ROM version of Medline. That service started in May 1989 and this study did not collect data about it. Whenever I refer to on-line literature searches, it means interactive on-line searches carried out by the library staff on request.
[26]See page 67.

complementary strategy of **Reading** and **Watching**. They go to the library to find a journal, to check a textbook or to watch a video that they do not possess.

This pattern of use is consistent with the reasons given by the 23 interviewees who do not use libraries. There is no contradiction between the two groups. If they are not reading for a postgraduate degree, or if they can find the information by other means, this strategy is not chosen.

General dental practitioners seem to stop using the library soon after their formal training (undergraduate/postgraduate) concludes:

> *'No since I've finished my finals in 1982. I've not found it necessary for the work I'm doing, also I find it very time consuming. If I were back to the Hallamshire Library* [HHL] *I wouldn't know where to start'* (Int.No.87/Q.34).

Another reason is that they do not find it necessary. They feel they get all the information they need from other sources. **Reading** and **Talking** are considered far more suitable strategies (Int.Nos.90;99;102;106;110;112;120;123;126;137/Q.34):

> *'I've been able to find out what I've required from literature I've got available or from contact with colleagues'* (Int.No.99/Q.34).

> *'In relationship to my work because I tend to follow the line that I've already explained to you: read something in a journal and then go to a lecture about it. I tend to prefer to go to lectures with a few other people, where you discuss the topic rather than just getting something out and reading about it it's a bit more... with Dentistry it's more of a practical subject, it's not just what's written on a sheet, I like to discuss it with a few other people, you tend to learn more in that way'* (Int.No.110/Q.34).

Time, distance and a wish to possess their books, to have the materials at their permanent disposal are also factors that make **Using the library** a less attractive strategy (Int.Nos.87;107;114;115;124/Q.34):

> *'It would have meant going over to Sheffield which is a bit of a trek and it is not all that often that it's necessary to actually use a library since most of the information is available without going to a library. Now I believe there are some books actually in Chesterfield, so perhaps it would change that. Because it's a bit more readily available, it is on the way home rather than actually making a journey 40 minutes there and 40 minutes back. And I'm not a personal user of libraries a lot anyway. If I want a book, I do buy novels. I've always found that if I go to the library and borrow books, I don't necessary want to read there and then. I leave it on one side and forget about it and I end up getting a fine. So I'd rather buy the book, then if I don't want to read it, I put it down and maybe I'll read it three months later'* (Int.No.115/Q.34).

There is also a wrong perception of the library and a lack of knowledge of what the library is able to offer them. Some interviewees identify the library with a collection of outdated textbooks (Int.Nos.118;129/Q.34):
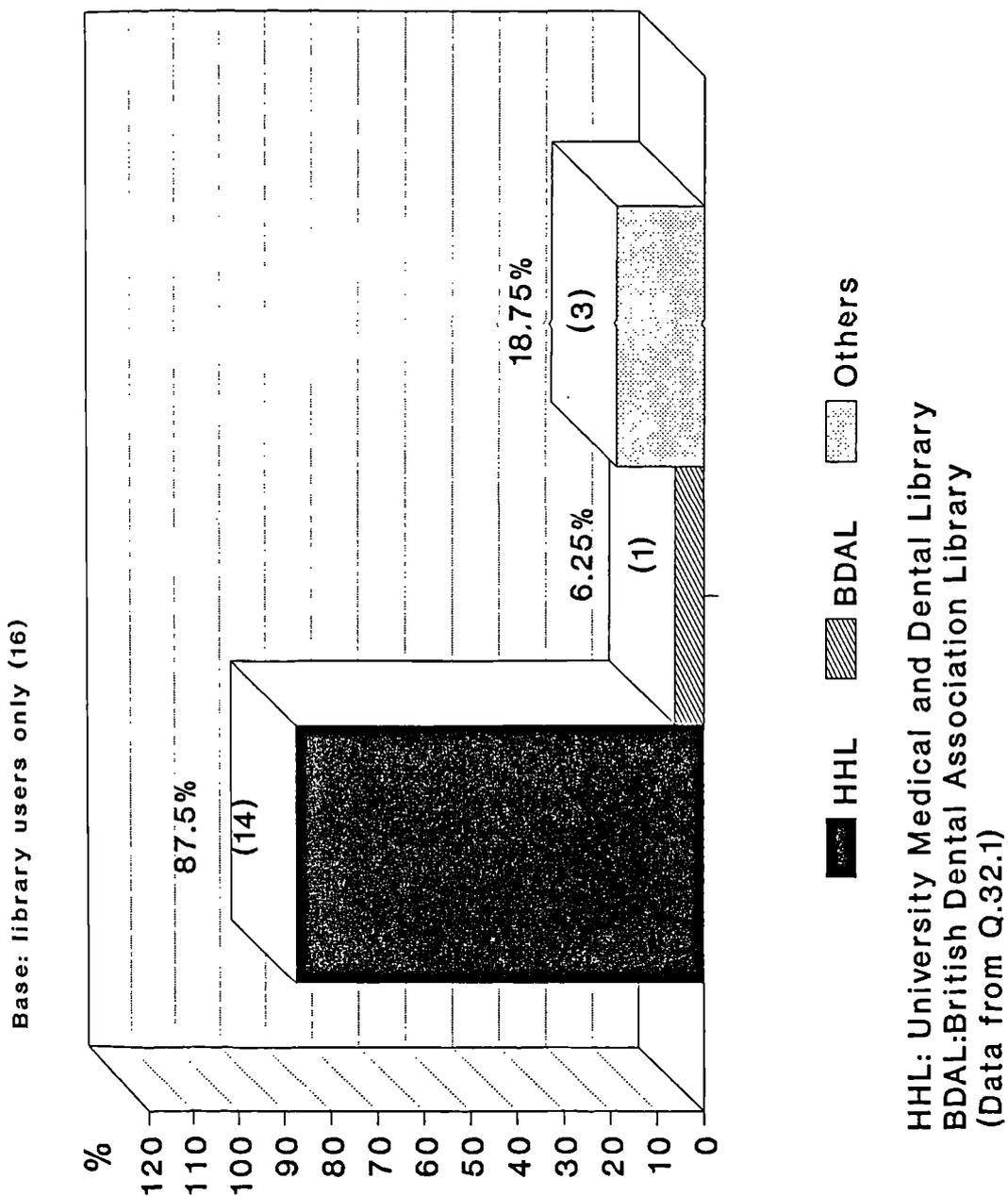
Figure 6.13: Libraries used by general dental practitioners

Visitors
28%
(11)

Active
8%
(3)

In the past
36%
(14)

Never
28%
(11)

(Data from Q.37)
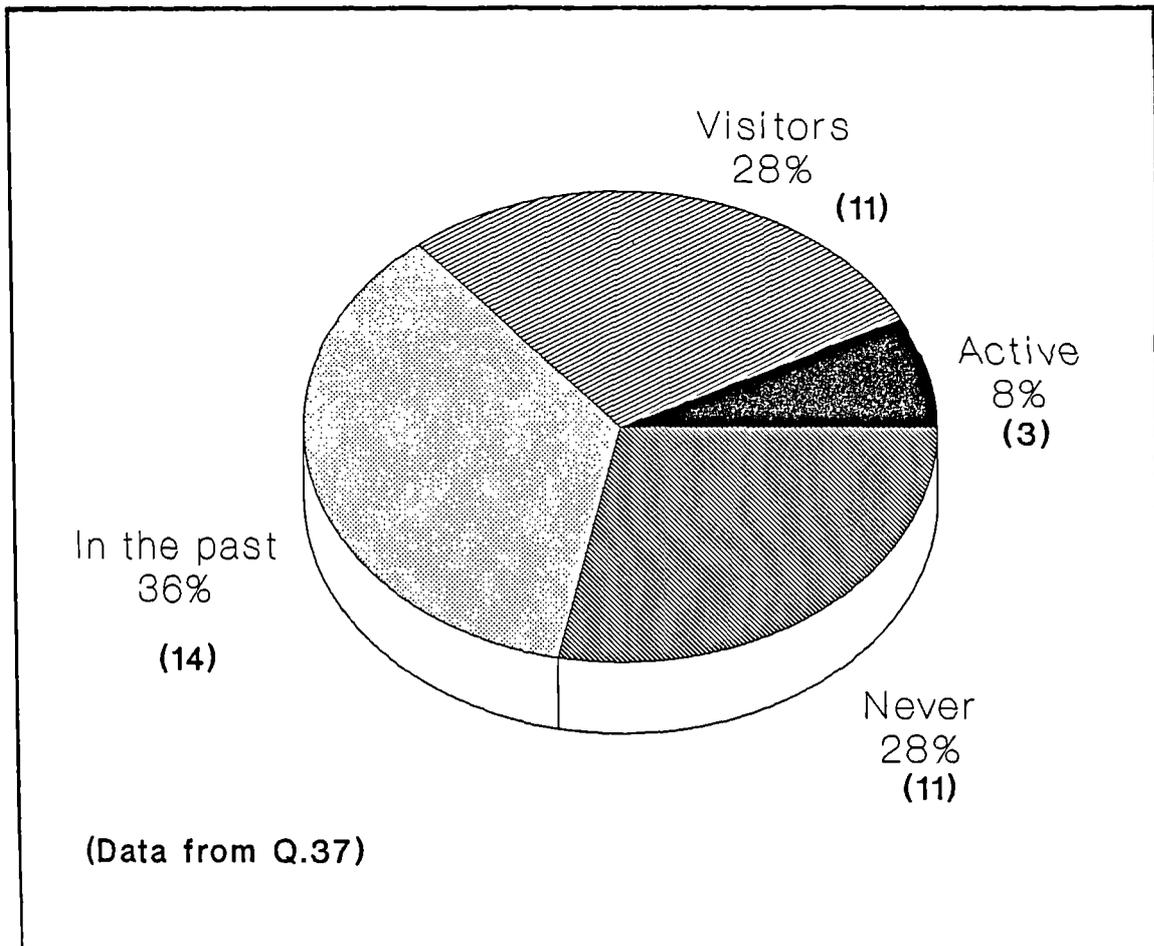
Figure 6.14: **Use of the University Medical and Dental Library (HHL) by general dental practitioners**
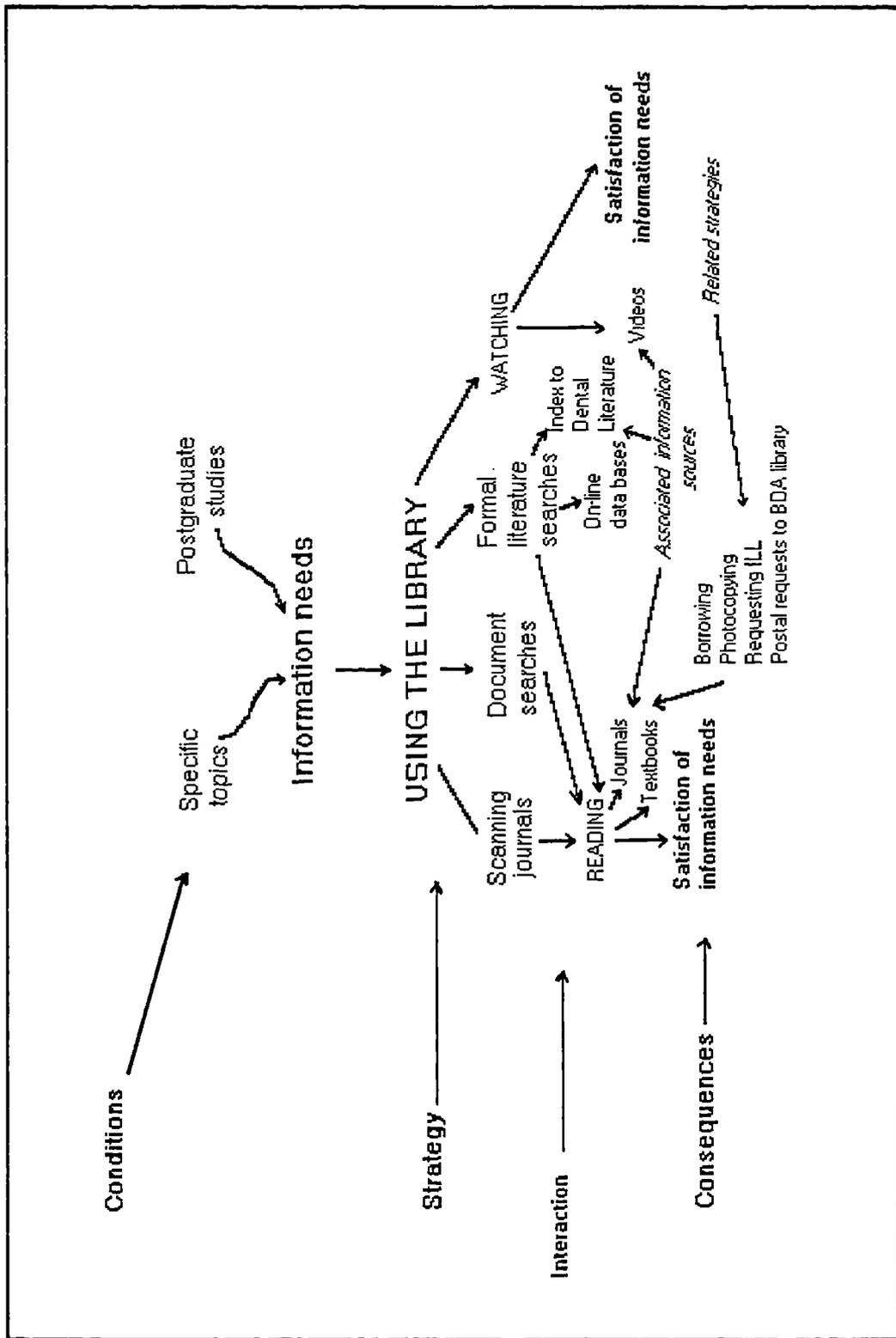
Figure 6.15: Using the library as a basic strategy for general dental practitioners

'Because I don't find that libraries are so as up-to-date as the journals to be honest. I think that by the time the information has been published, gone through the journals, got into the books, got into the libraries, probably 5 years are gone by, so I tend to ignore them' (Int.No.129/Q.34).

Others do not actually know whether they are entitled to use the HHL or not and some even believe that they cannot do so(Int.Nos.105;111/Q.34):

'Firstly I thought several times that I would like to use the old dental-medical library at the Hallamshire [HHL], the medical school library because I remember... there are certain things that I would like to go and read around but I'm not entitled or I'm not sure whether I am entitled to, for one. It's something that I've been meaning to do at times and never get sorted out. The other one is the BDA [British Dental Association] library which the practices use but I haven't. Some other colleagues had used it, ordered the odd books... I personally have never used one. I've heard of certain texts again if I had the time I would. I know where they are and I know I can get them. It's just a matter of... I know what the access [is]' (Int.No.111/Q.34).

In general the interviewees are not aware that they are doubly entitled to use the HHL in the first place and secondly they are less aware of the full range of services available than other dental professionals. This lack of awareness may be caused by a lack of interest (Int.Nos.117;131;132/Q.34):

'I couldn't be bother, I have never rang up the University to say "please can I use your library?".' (Int.No.117/Q.34).

But this lack of interest can be interpreted neither as a failure of the library services, because they succeed with those who use them, nor as an absence of information seeking behaviour on the part of the general dental practitioners, because as we have seen they do seek information. In fact one of the interviewees who actually uses the library has given the best interpretation:

'... The problem is... if there is something that you are so unsure about it that you need to go and look it up in the journals [she is referring to journals held by the library] then it is something that you don't have actually to deal with it in the practice' (Int.No.108/Q.33).

General dental practice does not confront dentists with clinical situations where Using the library may become unavoidable, as it does with hospital staff[27].

6.3.2 Patterns of information-seeking behaviour

The simple patterns rely on either **Enquiring, Reading** or **Talking** (See Figure 6.16). If the information needs are related to the medical condition, the medication or the dental condition of the patient, enquiring from a medical practitioner or consultant usually over the telephone, reading from a textbook preferably at the practice, or talking to a colleague for a second opinion or a referral are fast and successful ways of obtaining information (Int.Nos.87;108;116;137;141;142/Q.1):

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[27]See 7, **Using the library** page 150.
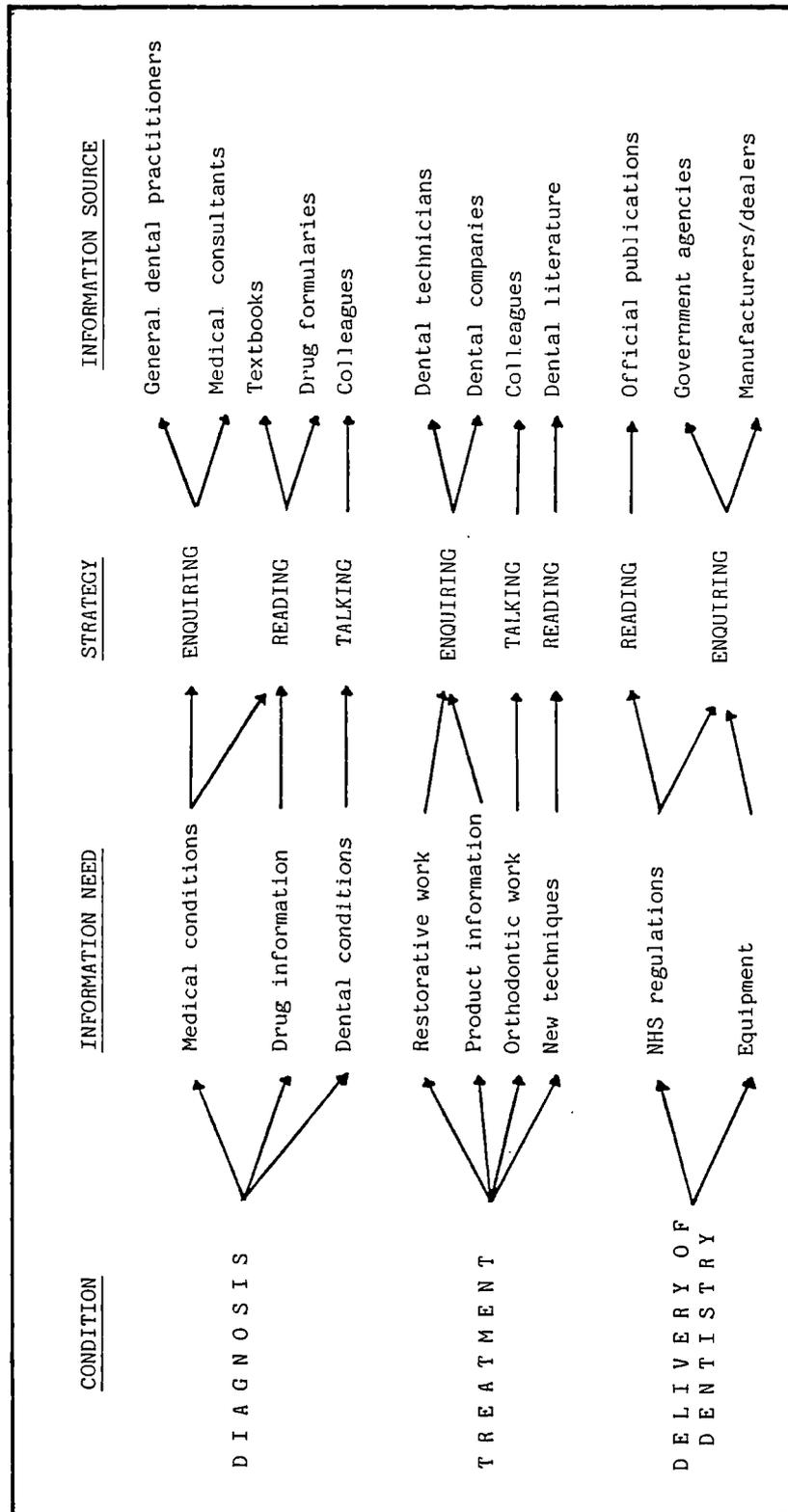
Figure 6.16: Simple patterns - General dental practitioners

> R: I've requested... advice from a colleague... regarding patients gener-
> ally... yes medical colleague, and that's been done locally. That particular
> one I knew the colleague as well.
> I: How did you contact...?
> R: By telephone usually.
> I: In this particular case that it was related to a patient, did you look for
> information in any other way?
> R: No, it was only relevant that I wanted to check on his recent medical
> history. He was a high risk patient with regard to any sort of treatment
> and I needed consultation quite quickly so I picked up the telephone. Had
> the doctor not been available immediately I would have to wait for personal
> contact, anything other would have been not satisfactory.
> (Int.No.141/Q.1).

> R: A patient who was suffering pain and I was not sure how to deal with
> the problem so I telephoned the consultant.
> I: The consultant where?
> R: That was in Bradford not in here. I work in Bradford as well. The
> patient was there, I referred [the patient] back to the consultant.
> I: Do you look for information in any other way for this particular case?
> R: No. (Int.No.137/Q.1).

> R: If somebody comes with a medical condition I'm not familiar with, then
> obviously I'd have to look it up.
> I: How do you find the information about...?
> R: I normally look it up in a textbook.
> I: Did you look for information in any other way?
> R: No.
> (Int.No.116/Q.1).

The same three basic strategies appear again in the case of treatment-related in-
formation. The variation is in the specific sources that are selected. Advice about
restorative work requires enquiring from the dental technicians, because in this par-
ticular situation the general dental practitioner needs the practical expertise of the
technician rather than pure facts that he can easily read again in a textbook. Enquir-
ing from a dental company may be in writing but another possible variation is through
the dental trade representative. Advice about orthodontic work requires talking to a
colleague but in this case the colleague is somebody with specialist knowledge, rather
than another general dental practitioner. Reading as a strategy to find information
about new techniques – a constant information need of general dental practitioners-
is related to a wider spectrum of dental literature: textbooks as well as journals
and manufacturers' literature; but regarding its contents, this literature is usually at
general level[28] (Int.Nos.107;109;119;120;125/Q.1):

> R: I suppose the commonest thing is the [...] mouth wash that is available
> now, I would like to know more information on that so I knew what to
> recommend to patients.

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[28]See page 65.

I: How did you find out more information?

R: Well actually I wrote to the company and they are sending me some of the clinical evidence that they have got.

I: Have you done anything else to find out more information?

R: No.

I: Have you received the information?

R: I've received some free samples this morning with the promise of the information to come in.

(Int.No.107/Q.1).

R: It was basically an orthodontic case that I was a bit unsure what to do. So I took some models... and I work in the dental school one half day a week, I went and asked someone, who works there, what was the best thing to do with the case I was doing.

I: So you asked a colleague.

R: Yes, I asked a colleague.

I: Did you look for information in any other way.

R: No.

(Int.No.125/Q.1).

R: It's about providing porcelain veneers and basically various techniques for fixing these veneers onto the teeth. Do you want to know how I looked for information?

I: Yes.

R: Basically just from reading litrature, both in professional journals, from back copies, a journal called 'Dental Practice' and also from textbook literature.

I: Did you look for information in any other way?

R: No, I... just took those as a first avenue and I found what I wanted there so I didn't feel like I had to go any further.

(Int.No.119/Q.1).

Again **Reading** and **Enquiring** are the two alternatives regarding practice management (Int.Nos.98;106;126/Q.1):

R: Yes I have actually... mainly trouble with lights and things like that.

I: Trouble with lights?

R: Yes, electrical.

I: And how did you find the information you needed?

R: I rang up the actual dealer, who sold it to me, but not make it, and that's the main way I'll do it. I always use the chap that sold it to me if it is a mechanical problem.

I: Did you seek information in any other way?

R: No.

(Int.No.106/Q.1).

R: I think the situation that commonly occurs really is to do with what is or isn't permissible under the NHS contract...because the goalposts are always being changed and you have to keep up with what new regulations

are allowed or not. That's the common area where I would be looking for information.

I: How do you look for information in that case?

R: Well in that case we just look the handouts from the DB [Dental Practice Board] which are altered in April and October and it's as much ferretting through those to sort things out. The area in which I've been looking up recently it's Orthodontic work, where the guidelines have been changed. (Int.No.126/Q.1).

Reading, Talking and **Enquiring** are the key strategies to understand the information-seeking behaviour of general dental practitioners. These three basic strategies can satisfy most of their information needs. **Reading** and **Talking** are preferred as initial strategies whenever they need information[29] **Enquiring** is unavoidable for certain conditions[30] and because of that, despite of its shortcomings, it is not dismissed as it is **Using the library**[31].

Combined patterns are used whenever the initial strategy: **Reading, Talking** or **Enquiring** is not enough and further information is needed to solve the situation (See Figure 6.17). The initial strategies may appear combined between themselves or with **Attending..** or **Using the library** (Int.Nos.96;98;101;105;112;114;117;135/ Q.1). The latter are never used on their own and because of that they have not appeared in the simple patterns:

R: Only in so far as the rules and regulations of the National Health Service.

I: How do you find this information? How do you look for this information?

R: Looking in the services manual, failing that, you ring the DB [Dental Practice Board] hardly ever I had to do that. (Int.No.117/Q.1).

R: There are several ones. I've just bought a new surgery so that required information about it.

I: How did you find the information?

R: From the journals, from the companies I knew in that field.

I: What sort of information did you need?

R: Well costs of different equipments, types of different equipment...

I: Have you looked for information in any other way?

R: No. (Int.No.114/Q.1).

I: And when you want to find non-biased information about new products how do you normally find it?

R: Well, if there isn't anybody to... well... actually we've got... my daughter is doing Dentistry so if I want to find out something at the moment I shall ask her to ask one of the people at [the dental] hospital, who is doing perhaps research in that area, and what they use and they think, but that's not going to last much longer... that has been quite useful over the last

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[29]See pages 67 and 75.

[30]See pages 64 and 80.

[31]See page 98.

sort of 2 or 3 years. We do... I do go to the ones at the hospital, they have here, they have had a sort of general update on Restorative Dentistry once a year, and they in that they will always follow ... the tutorials will be on materials. I do tend to pick up that one and then you know if it is necessary I ask them. (Int.No.105/Q.1).

I: In the other case when you need information about dental materials, how do you obtain this information?
R: Journals, companies, reps [dental trade representatives], *I have phoned the dental hospital to make enquiries about dental materials.*
(Int.No.98/Q.1).

R: I suppose the most recent one... was with the new porcelain veneers that have come out... to find out how to actually prepare and to cement veneers.
I: And how did you find the information?
R: Well, I actually did go on a course at the Dental Hospital fairly recently. But several laboratories have actually sent out handouts on how to prepare them and how to cement them, just general circulars from the laboratories...
I: Did you find information in any other way?
R: Again in the journals, that... that we get there... there have been reports and things like that... the magazines that come round... the general dental magazines that come round again there is always a technical report in there.
(Int.No.112/Q.1).

R: A technical procedure.
I: How did you find out the information?
R: References to periodicals?
I: How did you get the references?
R: Just the library, you get there research journals and you just refer to those. It is not specifically research information, it's information on materials, techniques.
I: Did you look for information in any other way?
R: Asking colleagues, I suppose.
(Int.No.101/Q.1).

The complex patterns are a combination of as many basic strategies as it seems necessary (See Figure 6.18). Each strategy extends the information seeking towards the satisfaction of the same information need by exploring a different information source and obtaining a different kind of information (Int.Nos.103;105;111;113;118;123;132; 133;140/Q.1):

R: Mainly regarding types of dental attachments or a technical process.
I: How did you find the information?.
R: Usually the first thing is through my technician, either by phone or personal visit.
I: And then?

R: And also to do an expanding on the subject I attended a local course given by one of the manufacturers.
I: Did you seek information in any other way?
R: I've read what I can. I mean... generally on the subject, if it happened to be recently published articles in one of the journals that I take then I would have read it as well. I tend to find things out either in the journals or talk to people, to technicians generally. (Int.No.111/Q.1).

R: I didn't know anything on Fixed Orthodontics.
I: So, what did you do?
R: I went to a course [postgraduate course].
I: Did you find information in any other way?
R: I checked a basic textbook.
I: Anything else?
R: I talked to a colleague. (Int.No.113/Q.1).

[She is talking about Adhesive dentistry]. *R:... We can get a lot of information from the reps that come around but obviously they tend to push whatever they are selling and it's difficult to find out what are actually the best, you know, without committing yourself to having to buy them all, to try them all because you never get on well with a material that you are not familiar with. Do you know what I mean?*
I: Yes, I know.
R: So that's what we've been, that's the only thing really I've been interested in.
I: How did you look for information apart from the information given to you by the rep?
R: Well I went to a recent postgraduate day and we sent our associate on a proper course, on a week-end course. So when she came back we picked her brains about it [laugh] she is newly qualified so she tends to be more aware of things anyway and since then I had a video tape that comes from the postgraduate people, you know, but I must be honest I haven't watched it yet, but I am going to and we have actually invested in a few kits and we are trying them at the moment. That's the only thing I think that we are not really completely sure about it...[Adhesive dentistry] it's changing so much. (Int.No.123/Q.1).

R: Whether or not to install a computer.
I: How did you find out the information you needed?
R: I looked into the British Dental Journal and the other journals which I receive, well the British ones anyway, and I looked for advertisments of sales and then telephoned the companies concerned to see whether they were producing software specific for dental practice. Then many of them hold seminars, so I went to one seminar in Nottingham and one seminar... in Leicester and then I went to a large one which was in Sheffield. Information from pamphlets and brochures on computers and software were not much useful. You need to see them, you need to see them in operation and see what you can do and compare one with another. (Int.No.118/Q.1).

R: It's actually finance partnership arrangements.
I: Exactly what did you need and how did you find it out?
R: I really wanted to find out really how to manage a practice and legal considerations. The sources I went to were: bank managers, other partners in practice, past coursework at the university, books I have myself and articles in magazines, mainly Dental Practice, The Dentist, Dental Management and the British Dental Association helped as far as partnership arrangements. (Int.No.132/Q.1).

The simple patterns represent the most economic way of finding information. It is only when these patterns do not succeed that general dental practitioners engage in more complicated information-seeking behaviour. The combined patterns demand more time and the results are not as immediate as with the simple patterns; they appear in conditions related to treatment or practice management, but they have not been described for seeking patient-related information. The complex patterns have been described for the same conditions, but they represent a different approach. In the first case the failure of one strategy leads to a second one that succeeds in satisfying the information need. If the dentists cannot find the reply in the literature they usually read, they discuss it informally with a colleague; if they do not find the text of the regulations clear enough, they enquire from the health authority over the telephone or in writing, etc. In the second case the general dental practitioners try to find as much information as possible and they achieve that by complementing the results of one strategy with the results of all the others, for example they read, they go to a course, they talk to other dentists. Complex patterns are obviously more suitable for learning new techniques or making important management decisions. However simple patterns seem to succeed just as well. Eventually whichever pattern is applied, it is a subjective decision that varies not only from individual to individual but from one condition to another one.
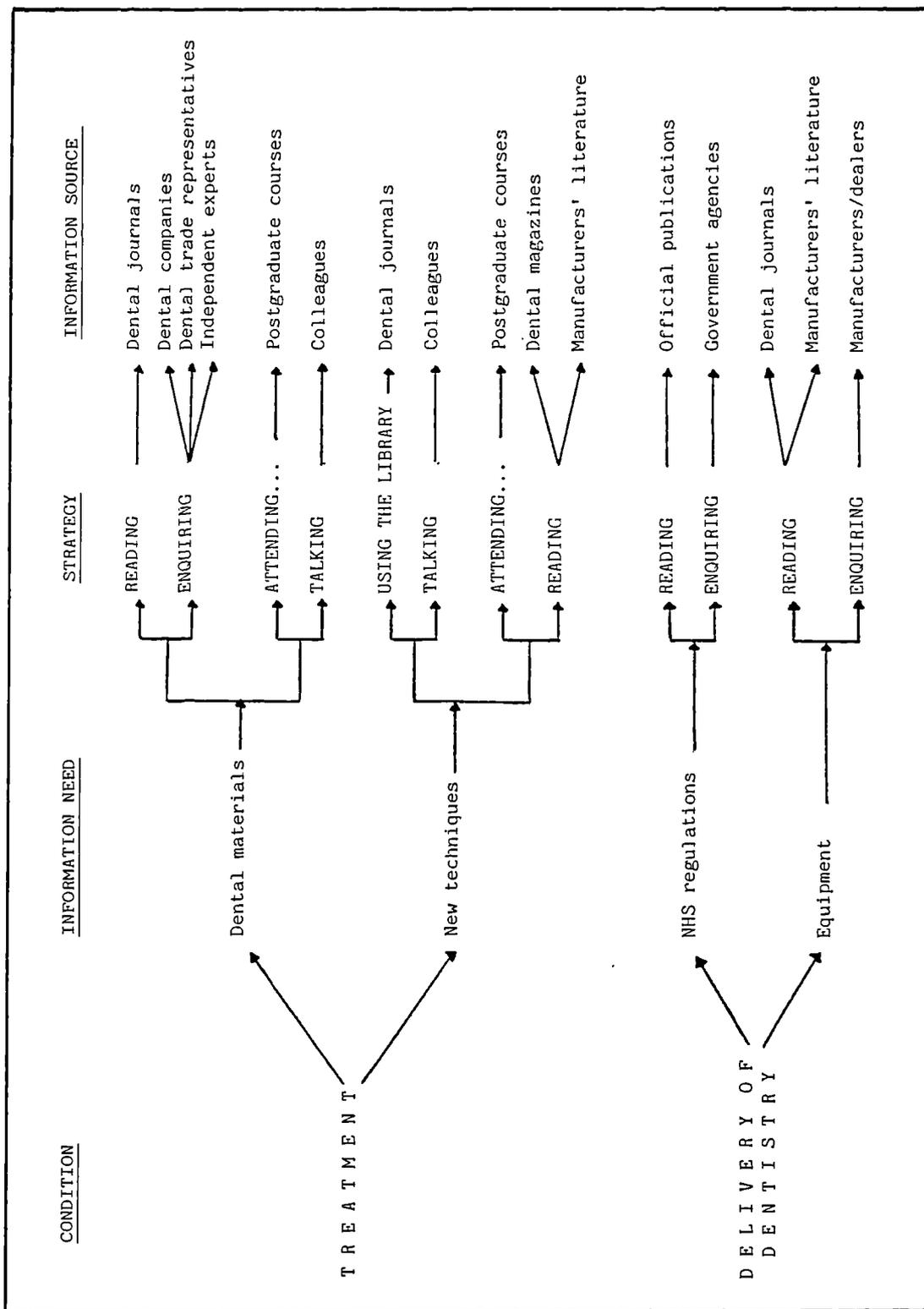
Figure 6.17: Combined patterns - General dental practitioners

CONDITION   INFORMATION NEED   STRATEGY   INFORMATION SOURCE

                                           ENQUIRING   Dental laboratories

                                                                 Dental technicians

                                           ATTENDING...   Postgraduate courses

                                           READING   Journals

                                           READING   Journals

TREATMENT   New techniques   Textbooks

                                           ATTENDING...   Postgraduate courses

                                           TALKING   Colleagues

                                           ENQUIRING   Dental trade representatives

                                           ATTENDING...   Postgraduate   courses

                                           TALKING   Colleagues

                                           WATCHING   Videos

                   Partnerhip   ENQURING   Bank managers
                   arrangements   British Dental Association

                                                                 General Dental Practitioners
                                                                 Association
                                                                 Financial experts

                                           READING   Coursework from undergraduate course
                                                                 Books
                                                                 Journals

DELIVERY OF   Buying and selling
DENTISTRY   the practice   TALKING   Colleagues

                   Equipment   READING   Journals

                                                                 Manufacturers' literature

                                          ENQUIRING   Manufacturing companies

                                                                 Government agencies

                   Health and Safety
                   regulations   ATTENDING   Seminars

Figure 6.18: Complex patterns - General dental practitioners

Chapter 7

The Use of Information by Hospital Staff

7.1 The dental professionals working in the hospital environment

I interviewed 86.2% (25) of the dentists who worked at the Charles Clifford Dental Hospital (See Figure 7.1). Only four dentists did not take part in the study; two of them declined, one was not available during the interview period and another one never replied to the invitation.

The 25 dentists, who took part in the study, qualified between 1948 and 1989, the actual year of the interview; 20% of them had more than 30 years in practice and were planning their retirement, they were also at the top of the hospital scale, holding positions as consultants or associate specialists. At the other extreme, 28% were young graduates with barely a year or even months of professional experience; they were house officers, the initial grade in the hospital career. The majority of them (62%) was between these two extremes, but their professional age went from only two years to almost thirty years experience (See Table 7.1). Although the graduates from Sheffield were the largest single group, the majority of the interviewees had graduated from six different universities in the United Kingdom and only one of them had a foreign degree (See Table 7.2). They aimed their postgraduate training at the fellowship of the royal colleges of surgeons; 60% were fellows from the Royal Colleges of Surgeons of England, Edinburgh or Glasgow and none had a postgraduate degree in Dentistry. However, three of them had a medical degree as well. Five were doing postgraduate studies at the time of the interview, but only two were reading for a masters degree at the local university, the other three were preparing the examinations for the Fellowship in Dental Surgery (See Table 7.3).

They represented all the grades of the hospital scale from consultant to house officer; but because most of the positions were either at the bottom or the top of that scale, most of the interviewees were either house officers or consultants (See Table 7.4). The Charles Clifford Dental Hospital was their main place of work; 19 worked there full-time; six worked only part-time at the dental hospital but held full-time positions at general hospitals in Barnsley, Chesterfield, Doncaster, Rotherham and Sheffield (See Table 7.5).
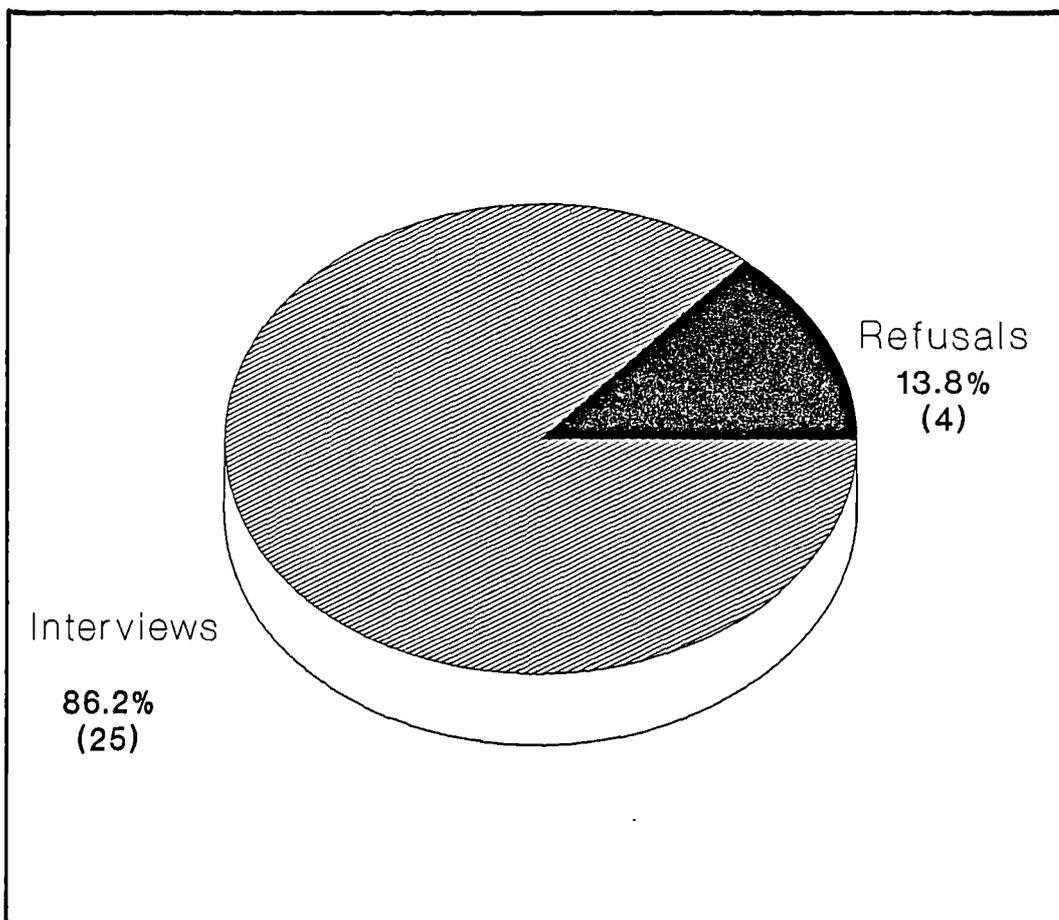
Figure 7.1: Response rate of hospital staff

Table 7.1: **Interviewees by year of graduation**

Year[a]	Graduates	%
1948	1	4.0
1949	1	4.0
1955	1	4.0
1956	1	4.0
1957	1	4.0
1962	1	4.0
1964	1	4.0
1965	1	4.0
1968	2	8.0
1969	1	4.0
1973	1	4.0
1975	1	4.0
1978	1	4.0
1982	1	4.0
1983	1	4.0
1987	2	8.0
1988	4	16.0
1989	3	12.0
TOTAL	25	100.0

[a]Data from Q.48.

Table 7.2: **Undergraduate training by dental school**

University[a]	Graduates	%
Sheffield	10	40.0
Leeds	3	12.0
Newcastle	3	12.0
Liverpool	1	4.0
London	4	16.0
Birmingham	2	8.0
Belfast	1	4.0
Abroad	1	4.0
TOTAL	25	100.0

[a]Data from Q.49.

Table 7.3: **Postgraduate training**

Level of training[a]	YES		NO	
	%	()[b]	%	()
Professional qualifications[c]	60.0	(15)	40.0	(10)
Postgraduate degrees	0.0	(0)	100.0	(25)
Current postgraduate studies	20.0	(5)	80.0	(20)

[a]Data from Q.50 and 51.
[b]Values in () indicate frequencies.
[c]Membership and Fellowship of the Royal Colleges of Surgeons.

Table 7.4: **Status in the hospital**

Status[a]	Interviewees	%
Consultant	9	36.0
Associate specialist	4	16.0
Senior Registrar	1	4.0
Registrar	2	8.0
Senior House Officer	2	8.0
House Officer	7	28.0
TOTAL	25	100.0

[a]Data from Q.56.

Table 7.5: **Place of work**

Kind of hospital[a]	Interviewees	%
Hospital attached to dental school[b]	19	76.0
Hospital not-attached to dental school	6[c]	24.0
TOTAL	25	100.0

[a]Data from Q.52.
[b]Charles Clifford Dental Hospital.
[c]They work part-time at the Charles Clifford Dental Hospital.

Table 7.6: **Practice by speciality**

Speciality[a]	Interviewees	%
Restorative Dentistry[b]	3	12.0
Oral & Maxillo-Facial Surgery	6	24.0
Orthodontics	4	16.0
General Dental Practice	9	36.0
Others	3	12.0
TOTAL	25	100.0

[a]Data from Q.59.
[b]It includes Periodontology, Conservative and Prosthetic Dentistry.

The hospital employs an extensive team of paradental staff from technicians to secretaries, including dental surgery assistants, hygienists, nurses and radiologists[1]. Although there is not exactly one dental surgery assistant for each dentist and a house officer may find himself working single-handed at some point during a busy clinic, the hospital dentists work routinely surrounded by other colleagues, with constant support from technical and auxiliary staff and in some cases even with the assistance of students from the dental school. The boundaries between dental school and dental hospital fade away during the everyday work especially in the clinics. In that respect the hospital environment is exactly the opposite to a small or even medium size practice; in the former there are more than a hundred people interacting daily, in the latter the dentist finds himself either alone or working on average with two other colleagues only.

Both the dental and the general hospitals provided treatment mainly under the NHS, as a consequence private patients were exceptional.

This group of dentists practiced in one of the three main dental specialities: *Restorative Dentistry, Oral and Maxillo-Facial Surgery and Orthodontics* or they were doing General Dentistry (See Table 7.6). However, General Dentistry at hospital level includes a wide range of patients from routine cases coming to the dental hospital in an emergency, to very serious cases formally referred by a general dental practitioner or another hospital[2]. The group doing General Dentistry included the house officers, who in fact rotated from department to department of the dental hospital: Children's, Restorative Dentistry, Oral and Maxillo-Facial Surgery and Primary Treatment Unit. Conversely the senior staff spent some time at the Primary Treatment Unit every week. So in the hospital environment those in General Dentistry get to do some specialist work or at least to work with specialists and the specialists never loose touch with Dentistry as a whole.

Senior and middle ranking members of staff (consultants to registrars) were involved in teaching both undergraduate and postgraduate students of the dental school. Their teaching responsibilities were clinically orientated and included either supervi-

[1]None of the interviewees could give accurate figures and I could not obtain that information from the hospital.

[2]Hospitals may refer their seriously ill patients to the dental hospital rather than back to the patient's general dental practitioner.

sion of the students' clinical work, tutorials or formal lectures. This same group was active in publishing papers or producing audiovisual materials, but none of them had had any experience in the development of computer software for Dentistry. Details about their research activities were more difficult to obtain. Five interviewees said they were doing some research in the field of their speciality but only the two who were reading for a postgraduate degree indicated their specific projects.

The dental hospital is a key health resource for the provision of dental care to the entire community and at the same time its close association with the dental school makes it part of the university life. The hospital environment is possibly the richest one for the dental professional. Specialization very seldom isolates the hospital dentists completely from the rest of the professional practice. On the other hand, routine cases turn up daily along with the challenging ones. Clinical work is the core of the hospital dentists' job but it does not exclude certain amount of teaching and publishing and even for some, research. Hospital dentists stand between the academic specialists and the general dental practitioners blending these two worlds in a world of their own; and this is the distinctive characteristic of this group.

7.2   The conditions for their information needs

Hospital work is a mixture of clinical, academic and management tasks, as a consequence the hospital dentists have described a wide variety of clinical, academic and management situations when information is needed (See Figure 7.2). A first group of situations is related to the diagnostic stage (Int.Nos.57;58;59;60;63;64;65;66;68;70; 73;75;76;77;83;85/Q.1):

> 'It was a patient who got an oral medicine problem, he got an ulceration in the mouth and I needed to get some information on the problem' (Int.No.63/Q.1).

> R: About clinical matters. My subject is fairly controversial and there are different points of view.
> I: Which is your subject?
> R: Orthodontics. There are different points of view about how to treat patients. Occasionally if you are in a group discussion about treatment planning it's quite useful to be able to justify your point of view' (Int.No.64/Q.1).

> 'Very often I need information related to the medical condition of my patients' (Int.No.66/Q.1).

> '[We need information] from patients at the beginning level, to know why they think they come for their treatment, what do they think is wrong, because Orthodontics is all about aesthetics and aesthetic values and it is important that you treat patients the way they perceive their need to be rather than what you perceive to be the problem. It's important, because often they are referred by their dentist, some people don't know why they are being referred, they are coming because the dentist says so. Other people know why they are being referred but they disagree, you know, they

think that what the dentist says is their problem while they think their problem is something else. But it's important that you deal with the patient's problem, because otherwise you have a dissatisfied patient. So the most important aspect is what's the patient's problem. So in the communication what we need to find out what that patient is complaining of, if it is function, is it appearance? What do they think it's the problem with appearance?. And often it's totally different from what I think they would be worrying about. They are worrying about something totally different. So it's very important that you find out what, what's troubling them, the patients' (Int.No.70/Q.3).

'...I need on-going clinical information, diagnostic information for a small number of my patients who nevertheless are very important... [Interruption] *It's to establish a diagnosis and therefore the correct and different treatment for all these patients'* (Int.No.73/Q.3-4).

I: Which is the aspect of your work, where you need information more frequently?
R: That would be working in the Primary Treatment Unit-Casualty Department.
I: Why do you think this happens?
R: You have a large throughput with a great number of patients, who can have any condition from a simple dental extraction to a complex medical problem, so you are constantly needing to speak to people who managed the patient before who were looking after the other condition related to the patient.
(Int.No.75/Q.3-4).

'History of people's complaints. [Because] *it is a major component of my work.* [Patients are referred to him for diagnostic purposes]
(Int.No.83/Q.3-4)

Initially, they need routine information about the medical and dental histories of patients. They also need to elicit why a patient has been referred and to make sure the patient understands these reasons. But the dental hospital receives all sorts of patients from simple cases that are dealt with straightaway to more complicated ones requiring long term treatment. At the same time, the daily flow of patients includes medically compromised cases. As a consequence, seeking information about specific medical conditions and rare syndromes is quite an ordinary situation for hospital staff.

At treatment level, assessment of individual cases, specific techniques that are needed to deal with a case and medication are the situations that may demand seeking information (See Figure 7.2). A dentist may feel unsure about a case not only at the beginning when the treatment is defined but later on when the treatment is in progress:

'It's generally when a patient that you are doing a treatment for or arranging a treatment for, so when you are unsure... the best way to do that treatment I ask for some advice from other member of the staff or perhaps also I read some literature to check things' (Int.No.82/Q.1).
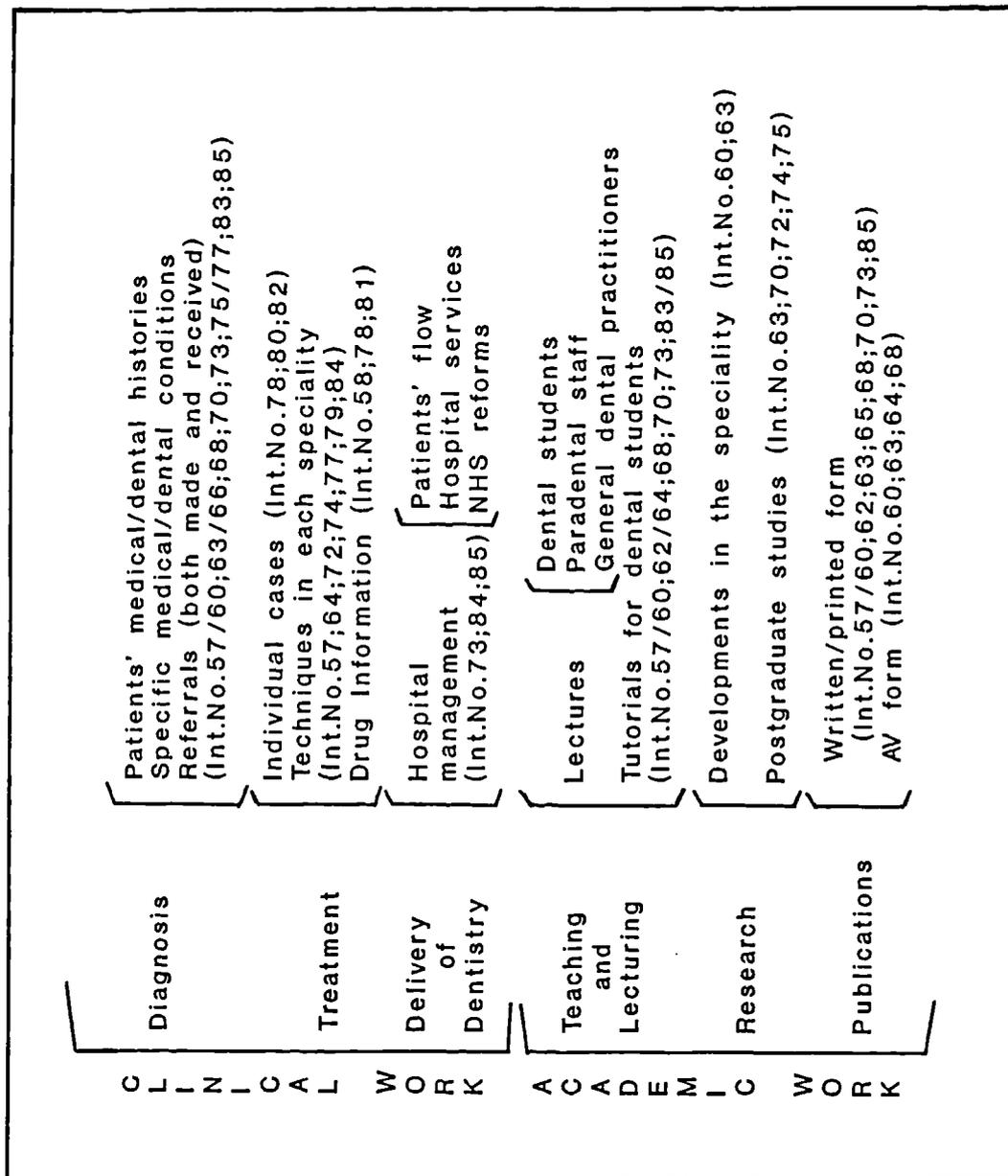
Figure 7.2: Conditions for information needs of hospital staff

Surgical operations that are not performed frequently enough, new techniques, and techniques never applied before are all situations when the hospital dentists seek information, as well:

'It was a patient with a large cyst in the jaw. He will need a bone-graft. It's something we are not doing everyday...' (Int.No.57/Q.1).

'The non-routine things... or the new experiences... the new operations you haven't done before' (Int.No.72/Q.3).

'It would be in [Oral] Surgery where may come... you may have to carry out some procedure that you don't do every day and you may need information about techniques and this sort of thing' (Int.No.74/Q.3).

'It was with regard to treating a young girl who fractured a tooth and then how to treat the tooth afterwards' (Int.No.79/Q.1).

Finally medication of patients makes hospital staff seek information about new products, drug interactions and possibilities of alternative medication.

Those consultants in charge of dental units at general hospitals were the only ones who described their information needs regarding the management of their departments as well as their concern for the lack of information and the future of their units:

'About activity information. That's quite important to know how many patients are being treated, for what I'm doing. I would seek, I seek this information on monthly basis...' (Int.No.85/Q.1).

'I would go on to a different area. I am a hospital consultant, visiting Sheffield and based in North Derbyshire and I work with an orthodontic colleague, we have a department to run and we have lots of other information, some related to clinical activities, though it is expressed in different ways. We need information about the general flow of our patients, and how they are managed. We are going into the costing, the specific costing per patient, as well as the overall cost in general terms of our department. And this is primarily because where I work it has been selected amongst other hospitals for a big management initiative[3]. There are several on-going research situations at hospitals with regard to the finances. We have [accountants firm] accountants, looking our hospital and one other in [another accountants firm] to try to ascertain the total costing system per patient. But I'm involved with my colleague in the on-going costs within our department... And your department is...? Oral Surgery and Orthodontics. A certain amount of our time and involvement is with our accountants and various other committees in keeping our services going and make them as economical as possible. Our hospital is surviving at the moment and in stringent circumstances but so far we have not directly cut back patients services. Although we are now falling down on our on-going programme of consultants'appointments and therefore the work which would have been picked up in the community' (Int.No.73/Q.3).

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[3]His hospital was taking part in the Resource Management Initiative set up by the Government to improve the production of acitivity data for medical audit purposes and general hospital management as well. (See WORKING for patients (1989) p.16).

The Government's reforms to the NHS outlined in *WORKING for patients* (1989) mean –amongst other things– a radical change in the managerial role of consultants. It seems that at the time of the interviews (October-December 1989) those consultants working at large general hospitals were already feeling the pressure of these changes and management information had already become for them as relevant as clinical or technical information. Meanwhile the consultants based at the dental hospital were still absorbed by their clinical and academic commitments and hospital management was not foremost in their minds.

Academic work presents another set of situations. Top and middle rank members of the staff are engaged in teaching and they require information to prepare lectures and tutorials, mainly for dental students, both undergraduates and postgraduates (Int.Nos.57;58;59;60;62;63;64;68;70;73;83;84;85/Q.1;71):

> *'Maybe a postgraduate lecture or a paper, which requires checking on references and trying to find out information. Over the years you tend to accumulate knowledge and from time to time I need to go back and just make absolutely certain what I think I know, really it's true'* (Int.No.62/Q.1).

> [Information is frequently needed] *'when I have to present... or to talk about specific subjects to other dentists or students'* (Int.No.68/Q.3).

Research work demands a constant up-dating:

> *'Obviously in terms of the research work that I do I have almost a continuous need, the sort of thing one goes to the library...'* (Int.No.60/Q.1).

> *I: Which is the aspect of your work where you need information more frequently?*
> *R: Oh that's related to the research aspect.*
> *I: Why do you think this happens?*
> *R: Well, because to be up-to-date in research you have to refer to current research methods and current research that is being done. Otherwise you find out that your research has already been done by someone, probably better than yours.* [The interviewee was doing research in the prevention of caries in dentine.] (Int.No.63/Q.3-4).

But postgraduate studies create more concrete information needs (Int.Nos.63; 70;72;74;75/Q.68):

> *I: What kind of information do you need to study?*
> *R: Lots of articles.*
> *I: That you obtain in the way you have already told me* [4].
> *R: Yes that's right.*
> *I: Anything else?*
> *R: I had clinical information because I was examining children, 1100 children. I went out to different schools and looked at them.*
> *I: In Sheffield?*
> *R: That's right.* [The interviewee was reading for a postgraduate degree.] (Int.No.70/Q.68).

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[4] The respondent requests on-line searches from the library and then she completes them with manual searches in the 'Index to Dental Literature'.

'Mainly textbooks; in other fields like dental materials or dental techniques you would try the journals' [The interviewee was preparing the examinations for the Fellowship in Dental Surgery.] (Int.No.72/Q.68).

'The information you need it is all basic sciences with some clinical applications' [The interviewee was preparing the primary examination for the Fellowship in Dental Surgery]
(Int.No.74/Q.68).

The last group of situations is related to the production of information either in printed or audiovisual form. The preparation of papers requires checking previously published literature (Int.Nos.57;58;59;60;62;63;65;68;70;73;85/Q.75):

I: What kind of information do you need when you write?
R: Information that is available from a standard text.
(Int.No.57/Q.75)

I: What kind of information do you need when you write?
R: All sorts of information really... it depends on what is on [the paper]
but it tends to come from the published literature.
(Int.No.63/Q.75)

Besides the use of printed literature the preparation of audiovisual materials requires advice from the technical department involved in the production:

'We used information from promotional literature, also the expertise of the University Television Service as well' (Int.No.63/Q.79).

However, hospital staff described their information needs related to the preparation of audiovisual materials more vaguely (Int.Nos.60;63;64;68/Q.79):

'Textbooks, I think' (Int.No.64/Q.79).

or

'All of that [what he needed to prepare tape-slides presentations] *was obviously available within the sources we have already talked about it'* [books and journals]. (Int.No.60/Q.79).

At the time of the interviews they were not preparing any video or tape-slides programme; they mentioned projects carried out some time in the past and perhaps that was the reason why they could not give more details about the information they had needed.

The conditions underlying the information needs of the hospital dentists are associated with two main information sources: the patients themselves and their files or the use of printed literature. Therefore they have identified information problems regarding the access to these sources.

They may face problems in the initial dialogue with the patient:

'Because people have no concept of time in the sense they do not know when their problem began or happened. Sometimes they do not have the words in which they could describe their problems' (Int.No.83/Q.5.1).

This initial problem continues when the lack of details is related to the medical condition of the patient; in this case the difficulties are caused by the referral system:

> *R: Occasionally we have problems when patients are referred from general hospitals with medical conditions. There is a problem in terms of getting very fast the information.*
> *I: Why this happens?*
> *R: I think it is generally because the system is slow, it takes weeks to write letters. Occasionally we have also problems with patients from dentists as well.*
> (Int.No.60/Q.5).

> *'For example a patient with a possible heart problem, which I am not sure about, you write to the patient's consultant and sometimes you get ambiguous answers or no answer at all'* (Int.No.66/Q.5).

> *'It's medical problems, that's the most difficult because it is hard to track down whoever was dealing with the patient on the medical side. It's also that what we do is like a branch of Medicine, the rest of the body does have an effect on it'* (Int.No.82/Q.5).

Administrative delays may slow down the referral system, but the lack of understanding between medical and dental professionals is also another factor that affects the flow of information.

The use of printed literature is likely to present problems because of the sheer amount of it:

> *'Going back through the "Index Medicus", because there is so much of it'* [The respondent refers to a manual search of the "Index Medicus"] (Int.No.57/Q.5);

because they do not have enough time to carry on the search themselves and therefore they need to rely on library services (Int.No.58/Q.5) or because the particular document is not directly available in the library:

> *'It could be hard to get a particular journal usually because it is not kept in the library or because it is an old issue, previous to the time the library started to receive the title'* (Int.No.68/Q.5).

They have identified other information problems as well. For example access to research results:

> *'I suppose recently published work is the most difficult because often... it hasn't filtered through the system well enough to become readily available. Do you know what I mean? Given several months or up to a year for instance, then it becomes available in the journals and can be picked up fairly easy, but before that time if you want it then it is much more difficult'* (Int.No.62/Q.5).

> *'Sometimes it's difficult to get information on work that has been done in Eastern block countries. You've got the language problem and also the other thing is that Eastern block countries tend to publish in their own journals which are not taken by the Western libraries. So consequently the Eastern block research is possibly undervalue'* (Int.No.63/Q.5).

> *'Every paper will tell you that what they have done, it worked, is the best in that field, that it has given the best results, whereas you really have to look at the way they analized the figures and the methods that they are using really and they are quite scanty in the description of their methods and their analysis'* (Int.No.79/Q.5.1).

Difficult access to research results is linked to the ways in which the scientific literature is published and distributed.

Information in computer form has been pointed out by another interviewee:

> *'Computerized... [information] because I am not converse with the use of computers, so actually I would be unable to extract the information from it. I'm about to make a start'* [He points to the computer on his desk] (Int.No.65/Q.5-5.1).

Information that cannot be found in printed form is also regarded as difficult:

> *'The most difficult kind of information to find is that which is controversial and not written down anywhere. You don't find Orthodontics in books. You do treatment plans on opinion rather that fact and opinion is a matter of trying to keep up to date by talking to people like senior registrars who come from places like London, who therefore were introduced to new ideas, that they have gained from talking to people who are... not doing research as much but doing very high standards of treatment. It is not a new book... well it is written down but not in the sort of way that one can just go and read about'* (Int.No.64/Q.5).

> *R: I think that information about practical things.*
> *I: Such as?*
> *R: Managing patients with particular kind of problems, maybe behavioural problems and things like that. Because quite a lot of the information about the techniques and the like, are in scientific papers, why do you do things and the right way to do things. But sometimes it is the practical day-to-day details, that is difficult to find, that's what you usually find out from other people.*
> (Int.No.74/Q.5).

In the special case of management information the problems are related not only to the importance of the current changes in the health system but also to the dentists' lack of training as managers:

> *'I'm a trained clinician so I can identify the information I want by seeing the patient, so that's easier. Management information is harder, you always need professional managers'* (Int.No.85/Q.5)

Despite all these problems, dentists working at hospitals succeed in meeting their information needs by means of the basic strategies that I describe in the next section.

7.3 The information-seeking behaviour of hospital staff

7.3.1 Basic strategies

Reading

Hospital staff apply this strategy to deal with almost every situation in their clinical and academic work (See Figure 7.3). They read to find out about the medical/dental conditions of their patients, the techniques they are going to apply or the medication they need to prescribe. They also read to prepare their lectures and their publications, to study, to find new jobs and to keep up-to-date with developments in the dental profession at both the scientific and political levels. The two associated information sources for this strategy are patients' files and printed literature.

Reading patients' files has been identified as a purposive information-seeking behaviour by hospital staff, while general dental practitioners never mentioned it. In the case of general dental practitioners, patients' information is related to **Enquiring**[5]. They need information to open and complete the files, but the files themselves do not create an information problem because the general dental practitioners tend to work with more stable groups of patients. As a consequence each practitioner keeps using the same file s/he has opened. Hospital staff faces a different situation. The throughput of patients in the dental hospital is not only larger than at an average dental practice but more unpredictable and unstable. Hospital dentists have some stable patients that they see regularly but at the same time they are seeing new patients and somebody else's patients every day. When they supervise dental students in the clinic, when they work at the Primary Treatment Unit, when they receive referrals from within the dental hospital, another hospital or a general dental practitioner, reading the patient's file is the initial strategy to learn about the patient's clinical history:

> 'It's the first place [the patient's file] I mean if I need information is about
> a patient almost always, first thing to do is to read the notes'
> (Int.No.65/Q.10).

However, serious or rare medical/dental conditions may require further reading, and then **Reading** is associated with the use of printed literature.

Hospital staff regardless of their position or speciality read journals; very few of them take dental magazines regularly (9) or buy books (4); only one mentioned manufacturer's literature and another indicated computer magazines (See Table 7.7).

Hospital staff read a combination of medical and dental journals (See Table 7.8) because they need to cover both the dental and medical side of their practice:

> 'I read the BDJ [British Dental Journal] regularly and the RSM [Proceed-
> ings of the Royal Society of Medicine] infrequently... because of their rel-
> evance. The BDJ will have literature directly relevant to what I am doing
> and also has information on career vacancies posts for the training courses,
> which is directly relevant for me at the moment whereas the Royal Society

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[5]See page 77.

Table 7.7: **Reading by type of document**

Type of document[a]	HS	
	%	()[b]
Journals	100	(25)
Magazines	36	(9)
Textbooks	16	(4)
Other	8	(2)

[a]Data from Q.14;22 and 23.
[b]Values in () indicate frequencies.

of Medicine the literature is more a background information and provides some points of interest but a lot of it is irrelevant' (Int.No.75/Q.14.2).

As this group of dentists collectively represents all the main dental specialities, the specialists journals that they read cover the fields of:*Restorative Dentistry (Prosthetics, Endodontics, Periodontology), Oral and Maxillo-Facial Surgery, Orthodontics, Children's Dentistry and Dental Radiology* as well as related subjects like *AIDS, Anaesthesia and General Medicine.* Hospital staff usually combine the regular reading of a general dental journal, for example *the British Dental Journal* with one or more in their respective specialities:

'As a means of keeping abreast of current moods in dental stream with regard to the "British Dental Journal" I think... and the "Journal of Clinical Periodontology" for what's happening in periodontal research in the clinical periodontal environment' (Int.No.63/Q.14.3).

This pattern explains why only the *British Dental Journal* is taken by as many as 88% of the interviewees and the other titles have considerably lower percentages (See Table 7.8).

Membership of professional associations and borrowing are the most frequent ways of obtaining their reading materials. But borrowing has a different pattern from that of the general dental practitioners[6]. Hospital staff borrow journals mainly from the University Medical and Dental Library at the Royal Hallamshire Hospital (21); the part-time consultants borrow from the medical library at their general hospital as well. Occasionally all of them borrow from other colleagues or the departmental collections at the hospital. Most of the interviewees find the journals that they do not receive at the library, so only 12 of them pay journal subscriptions independently of their membership of professional associations. Free mailed literature is less relevant to their kind of practice, only 8 receive magazines such as: *The Dentist, The Dental Practitioner or The Probe.* Personal purchases are even less frequent. (See Table 7.9).

Reading is a preferred initial strategy because it is associated with information sources that are easily available: the patient's file, own notes, books and journals. For example:

[6]See page 67.

Table 7.8: **Journals and magazines read by hospital staff (HS)**

Journals and Magazines[a]	HS %	()[b]
The AIDS letter (Royal Society of Medicine)	4	(1)
American Journal of Orthodontics...	16	(4)
Anaesthesia	4	(1)
Annals R. College of Surgeons of England	8	(2)
Australian Dental Journal	4	(1)
British Dental Journal	88	(22)
British Journal of Anaesthesia	8	(2)
British Journal of Hospital Medicine	12	(3)
Br.J. of Oral & Maxillo-Facial Surgery	36	(9)
British Journal of Orthodontics	16	(4)
British Medical Journal	20	(5)
British Society of Dentistry for the Handicapped [Annual report]	4	(1)
The Consultant	4	(1)
Dental Health	4	(1)
Dental Practice	28	(7)
Dental Update	40	(10)
The Dentist	4	(1)
Dento Maxillo Facial Radiology	8	(2)
European Journal of Orthodontics	4	(1)
The General Dental Practitioner	4	(1)
International Dental Journal	4	(1)
International Endodontic Journal	8	(2)
Int. J. of Oral and Maxillo Facial Surgery	4	(1)
Journal of Clinical Periodontology	8	(2)
Journal of Dental Research	4	(1)
Journal of Dentistry	12	(3)
Journal of Endodontics	4	(1)
Journal of Oral and Maxillo-Facial Surgery	8	(2)
Journal of Oral Rehabilitation	4	(1)
Journal of Paediatric Dentistry	20	(5)
Journal of Periodontology	8	(2)
Journal of Prosthetic Dentistry	24	(6)
Journal of the American Dental Association	8	(2)
Journal of the Canadian Dental Association	4	(1)
The Lancet	4	(1)
New England Journal of Medicine	4	(1)
New Scientist	4	(1)
Oral Surgery, Oral Medicine, Oral Pathology	4	(1)
The Probe	12	(3)
Proceedings of the BSDMFR[c]	12	(3)
Proceedings of the Royal Society of Medicine	8	(2)
Restorative Dentistry	12	(3)

[a]Data from Q.14;22 and 23.
[b]Values in () indicate frequencies.
[c]British Society of Dental and Maxillo Facial Radiology

Table 7.9: Origin of the literature

Origin[a]	HS	
	%	()[b]
Membership	88	(22)
Borrowing	88	(22)
Subscription	48	(12)
Free mailed	32	(8)
Purchase	12	(3)

[a]Data from Q.14 and 26.
[b]Values in () indicate frequencies.

'Accessability, I suppose. You don't need going to a person. People are never so accessible as the literature, are they? People move around, literature stays still' (Int.No.62/Q.11).

'Because it is readily available, they [the journals] *are understandable, they are cheap and I can use them ... I can read them at any time, my time is very valuable in these days, I can read them in bed at night'* (Int.No.85/Q.11).

However, because hospital staff read their own journals as well as those kept by the library, **Reading** is often mixed with **Using the library**:

'They [the journals] *are there. They come to the department, or they come to the library. You can carry them on a train. You can glance at them when you are watching TV. They are easy to put in your bag. I don't have to pay for them'* (Int.No.83/Q.11).

'They are accessible. One is directly delivered to me; several others are delivered to our library. I can use them in my own time, I don't have to arrange a special time to look at them' (Int.No.84/Q.11).

Another characteristic is that hospital staff selectively read the journals that they receive on regular basis:

'I go through them to survey them on current topics I'm interested in' (Int.No.58/Q.14.3).

'I go through them. I select and tend to read in depth the ones that I have my interest. "The Proceedings of the British Society" [7] *I tend to go through because I am very involved with that society at the moment... I tend to go through them much more closely'* (Int.No.62/Q.14.3).

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[7]"British Society of Dental and Maxillo Facial Radiology".
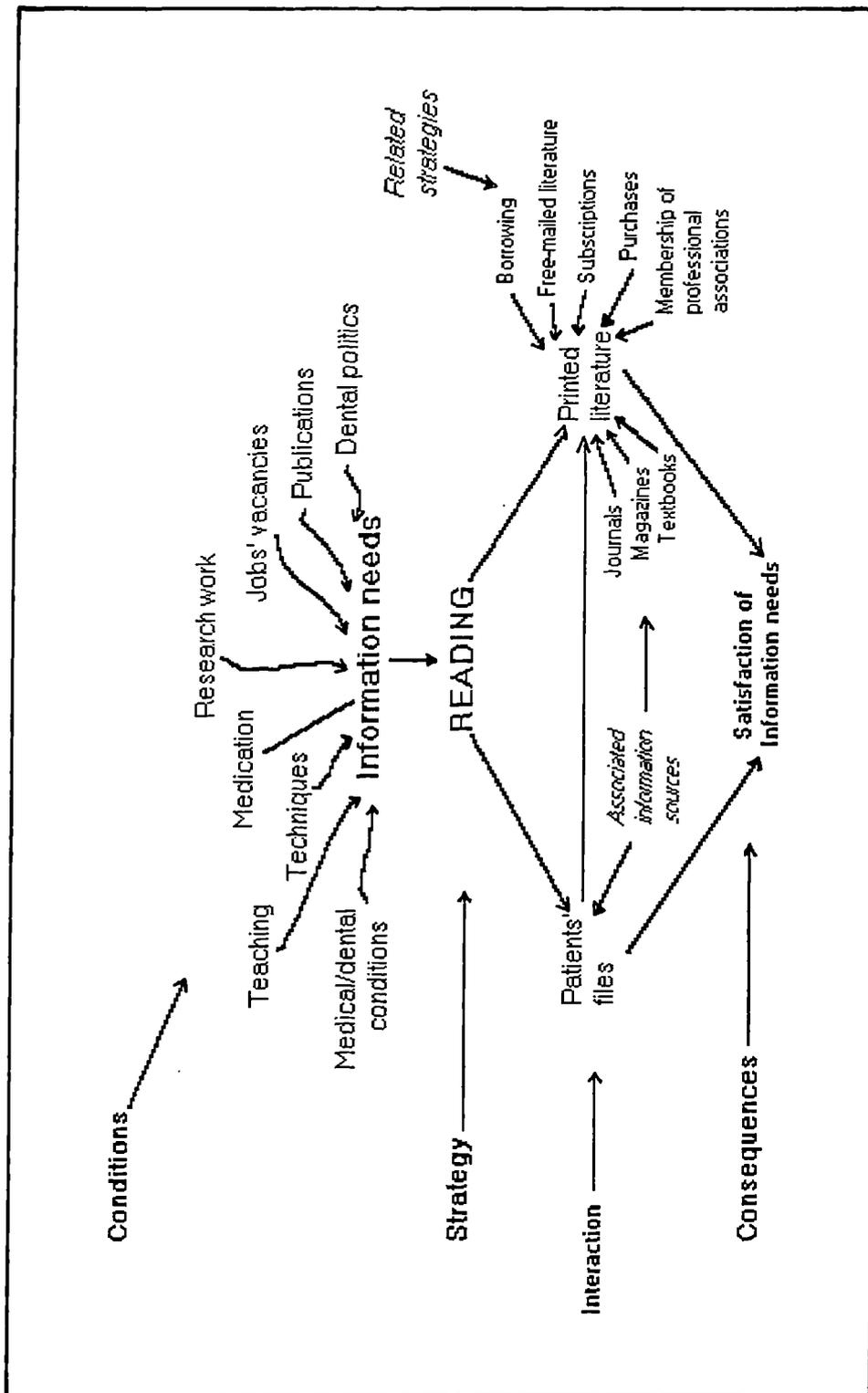
Figure 7.3: Reading as a basic strategy for hospital staff

Table 7.10: **Collections of dental literature**

Type of collection[a]	YES		NO	
	%	()[b]	%	()
Personal collections	88	(22)	12	(3)
Library at work[c]	68	(17)	32	(8)

[a]Data from Q.29 and 30.
[b]Values in () indicate frequencies.
[c]Library or bench collection held by a department in the hospital.

'...to know which guys are writing the papers and see if I know them; to keep in touch. Also the BDA's journal [8] *has job advertisements, one of the first bits I look, and the letters'* (Int.No.68/Q.14.3).

'I read only what is interesting to me...I take all the Orthodontic [journals], *I take the European, the American, I take "Dental Update" as well by post, so you have to be selective, so I read nothing that I think I don't like'* (Int.No.70/Q.14.3).

'I always try to see if there are... well first of all to see if there is any interesting article... and I also look at the back pages to see if there are any courses coming up, and because I am in hospitals, I work... every year... [in a different place] *you are looking for new jobs, so you are always looking at the back* [of the "British Dental Journal"] *for new jobs'* (Int.No.74/Q.14.3).

In these examples **Reading** is a strategy applied for keeping up-to-date in the speciality, being aware of what is going on in the profession, and looking for jobs.

Journals, photocopies and notes, once they have been used are filed. Personal collections either at home or at work are kept by 88% of the interviewees and 68% of them know that they have access to the departmental collections of the hospital (See Table 7.10).

Each department at the Charles Clifford Dental Hospital, as well as some dental departments at general hospitals, keeps a bench collection.

In theory, bench collections consist of a set of basic textbooks on the speciality, kept at hand in the department for reference purposes only. Sometimes it also includes a few journals. These collections are open to any member of the staff (hospital and academic) and the postgraduate students from the dental school. Large collections have an author card catalogue and lending is controlled by the departmental secretary.

In practice, the situation is quite different. The size, the access, the level of organisation and the ownership, all vary from department to department. Some bench collections are just two shelves long, whilst others cover the walls of an entire office. Usually these collections are kept in somebody's office and this creates problems not only of access but also of ownership. Materials can be used as long as the occupants

[8]"British Dental Journal".

of the office are in, but when the office is empty, it is also locked. The occupants of the office may keep their own materials mixed with those that belongs to the hospital. Besides, some bench collections at the Charles Clifford Dental Hospital are in fact in the professors' offices[9], in that case access is only possible through the departmental secretary. Finally none of these collections is technically organized and proper lending systems are not possible because no member of the staff (academic, clinical or administrative) has got the time to look after them. Eventually hospital staff rely on their own collections or that of the University Medical and Dental Library at the Royal Hallamshire Hospital, as one interviewee said:

> 'Sometimes it is easier to go the library to find an issue' [because the journals kept by the department are never complete] (Int.No.70/Q.30.2).

Hospital staff show the same lack of ability to organize their personal collections as the general dental practitioners. They keep selectively some of the materials that they receive. For example they may keep the journals of their speciality and throw away the *British Dental Journal* and the free magazines (Int.No.85/Q.29.1) or they may cut out the articles they want to keep and dispose of the rest of the journal (Int.No.57/Q.29.1).

Journals may be stored in date order, while the photocopies, cuttings and notes are filed in no special order (Int.Nos.62;75;78;79;80/Q.29.1):

> 'The journals that I receive are kept in files, in order [date order]. The photocopied material is not filed in order, it's just kept' (Int.No.75/Q.29.1).

In some cases they have developed their own system of subject subdivisions (Int. Nos.64;72;73;74;76/Q.29.1) but they rely on their memory to find the items back because they do not keep subject or author indexes. Only one interviewee has a complete index for the collection of articles:

> 'I've got quite an extensive collection of articles I've gathered together over the years, which I cross indexed by author and by subject' (Int.No.70/Q.9).

But on the whole they have described their collections as 'chaotic' (Int.Nos.58;60; 63;65;68;81;82;83/Q.29.1):

> I: Do you keep the material...?
> R: At least the "Journal of Clinical Periodontology" and "Prosthetic Dentistry" , I don't keep necessarily all the back issues of the "British Dental Journal".
> I: In the case of the journals that you obtain from the library, you just read them, you take notes or you make photocopies?
> R: All three. The articles where I feel that are either specifically research related that I'm doing or [they] are a changing technique or something like that I would photocopy.
> I: And the journals that you keep and these photocopies that you make how do you organize them?

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[9]In 1989, some professors and head of departments of the dental school had their offices in the hospital premises, while other members of the school had theirs spread in several other houses nearby the dental hospital.

R: Obviously the journals are just kept, the photocopies, I have a filing system, which is something of a state of chaos, it's basically subject related. (Int.No.60/Q.29.1).

R: Well I just file it in my filing system.
I: How is your filing system?
R: Chaotic.
(Int.No.63/Q.29.1).

I: You have told me that you read regularly several journals, what do you do when you find something interesting in the journal, you take notes, you borrow the journal to read it at home or you photocopy?
R: I photocopy.
I: How do you keep the photocopies that you obtain?
R: In a very poor filing system.
I: Why do you think it is a very poor filing system?
R: Because I think that if I had to extract an specific paper it would take some time to find it.
(Int.No.65/Q.29.1).

[The respondent keeps the journals at home. He keeps the "British Dental Journal" at the hospital because it comes there; he ends up cutting out the articles that he finds interesting and gets rid of all the rest. He does that with the "British Dental Journal" only. He photocopies the articles he finds in the library and keeps them in folders:] *'Just keep them at home... disorganized. I spent quite a lot of time yesterday trying to sort out things. It's frustrating really...'* [He couldn't sort them out]. (Int.No.68/Q.29.1).

Reading is used by hospital staff to learn about the patient's clinical history, to keep up-to-date with developments both in the profession and in the speciality, to know about courses or job vacancies, to check on serious conditions or techniques, to study and to prepare publications. Their own collections of journals, articles, notes and books have an important role in the implementation of this strategy, but they do not rely on these collections exclusively as the general dental practitioners do. Hospital dentists use their own collections as much as that of the library. Whilst their own collections are barely organized or not organized at all and they fail to impose any order on them, they are quite able to make sense of the formal organization of the library collection. Whenever they want to find specific information about any of the above mentioned issues, if that information is in printed form, **Using the library** is the strategy they implement either on its own or as a complement to **Reading**[10].

Talking

This strategy is implemented by hospital dentists to seek information about diagnostic problems, new developments in each speciality, the administrative side of their work at the hospital and the political aspects of dental practice in general (See Figure 7.4).

Hospital dentists talk about particular cases with their colleagues at work mainly to decide on a diagnosis and the corresponding treatment plan:

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[10]See **Using the library** page 150 and **Patterns** page 164.
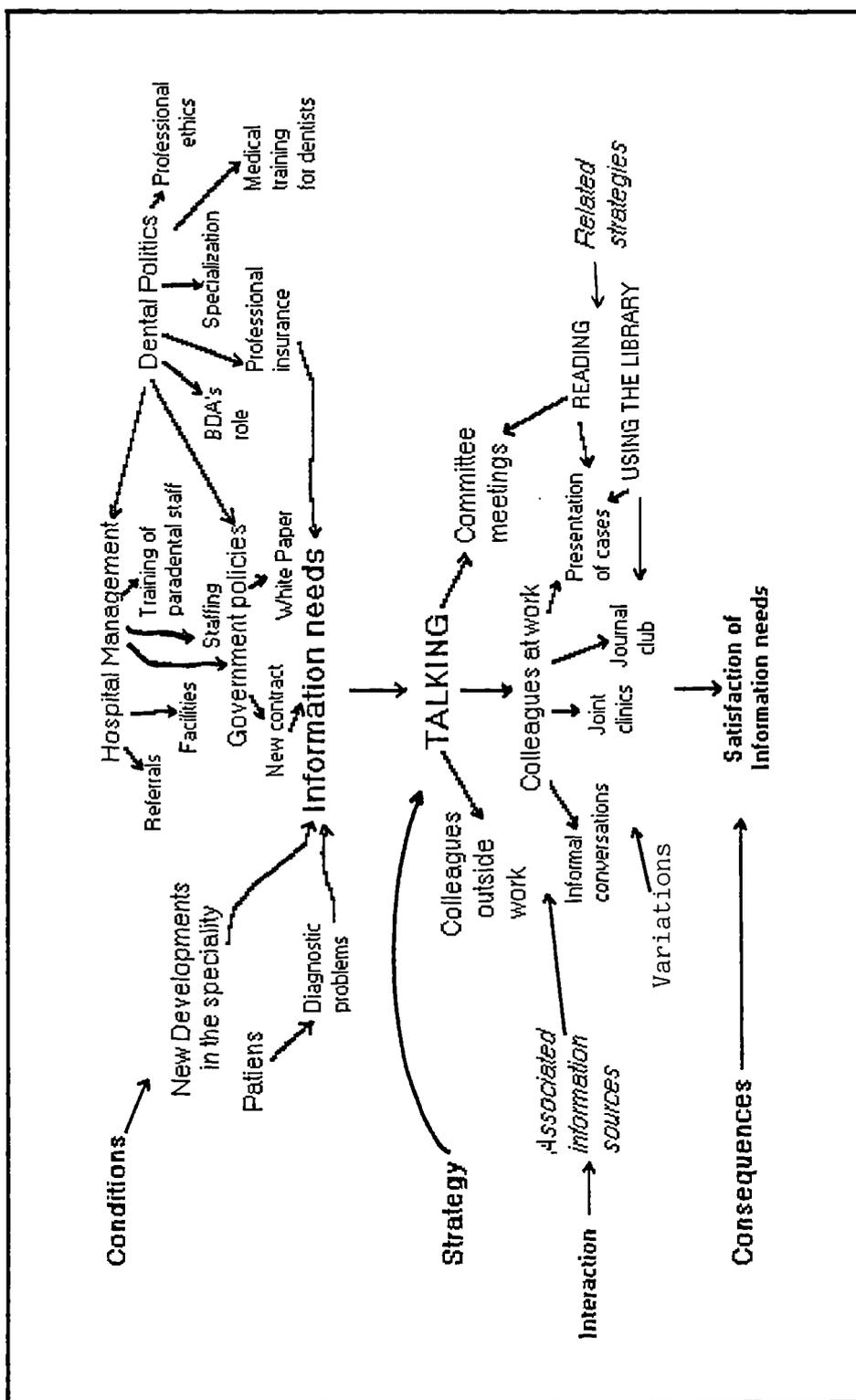
Figure 7.4: Talking as a basic strategy for hospital staff

'Diagnostic problems mainly, not treatment problems very often; a considerable portion of my time is spent on doing that [talking with other colleagues about diagnostic problems] *and another quite large section is dealing with the interpretation of films, so they all in a sense are coming to the same category'* (Int.No.62/Q.17.1).

'The easy ones usually never. The easy ones are always easy. The difficult cases, cases where it is difficult to make your mind up about it, there are a number of treatment possibilities and you are looking to make up your mind the best treatment for the patient. And then one looks for a colleague, looks the colleague for support, advice' (Int.No.70/Q.17.1).

Difficult, rare and serious cases are part of the daily routine of a hospital dentist[11]. Cases may involve more than one specialist, or there may be several alternatives for treatment, in these circumstances **Talking** is a suitable strategy to obtain information from colleagues.

Information about new developments in each speciality is also obtained by means of formal and informal conversations. **Talking** is used by hospital staff to keep up-to-date in their own speciality as well as in others and, unlike the general dental practitioners, they are not so much concerned with the feasibility and demand for innovations relevant for general dental practice, but with anything new even at experimental level. They have enumerated developments in each dental speciality: dental materials, dental radiology, dental pharmacology, oral and maxillo-facial surgery, orthodontics and restorative dentistry as well as general radiology, pharmacology and surgery (Int.Nos.57-85/Q.18.1). In fact because of the resources that are available at the dental hospital and its close association with the dental school, anything new: a technique, a product, a piece of equipment, even developments in the medical field, is likely to be tried first by hospital staff. Then **Talking** is again an appropriate strategy to exchange information that may not yet be available in any other way.

Issues related to the running of the dental hospital, such as the system for referring patients, facilities and equipment, promotion, salaries, training of dental technicians or dental surgery assistants, require the exchange of information between colleagues. **Talking** is used as an strategy in all these situations, as well as in the case of government policies affecting both hospital management and professional practice. Finally, the same strategy is applied to discuss every possible aspect of the profession from the role of the British Dental Association to professional ethics, including insurance, specialization and medical training for dentists (Int.Nos.57-85/Q.19.1).

Regardless of the situation (patients, developments, professional issues) hospital dentists use **Talking** as a strategy to obtain opinion, advice, somebody else's ideas or experience not as a means to avoid using other strategies but because it is the only appropriate one for the kind of information they are looking for.

Talking in the case of hospital staff presents formal and informal patterns of interaction. The latter are in the usual form of informal conversations that start spontaneously during a clinic, at coffee break or during lunch time:

'Usually two people start discussing something and if anybody is passing and decides that they are interesting in the same thing, it becomes more

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[11]See page 118.

formal, it depends on how much time people have... really'
(Int.No.64/Q.18.3).

'Informally in the clinics or over lunch, away from the clinic'
(Int.No.72/Q.17.3).

But hospital dentists –unlike general dental practitioners[12]– have formal patterns
to seek information from other colleagues. There are joint clinics to deal with specific
diagnostic problems, presentation of cases for teaching purposes, journal clubs to
learn about new developments and committee meetings to discuss various aspects of
hospital management and dental practice.

There are joint clinics whenever a case requires input from different specialists
in order to make the final diagnosis. For example the cancer joint clinics where the
patients are examined and the cases are discussed by the oral surgeons, the pathol-
ogists and the radiotherapists (Int.Nos.59;73/Q.17.3). There are also joint clinics in
Orthodontics:

> *'...The other cases we discuss Wednesday afternoons it's a joint-clinic,
> orthognathic cases, Orthodontics and Surgery combined. Cases that would
> involve another discipline. We would look to our surgical colleagues to
> discuss how we are going to help them, how they are going to help us.
> And the same goes for... we do quite a lot of combined restorative cases
> as well. So the cases that would require bridge work, crowns, [...] [facial
> deformities], missing teeth, where there is quite a large restorative input...'*
> (Int.No.70/Q.17.1).

Presentations of cases are made regularly to teach postgraduate students and
junior staff:

> *'We have a formal meeting once a week where the senior members of the
> staff, the consultants present a case, again it would be something that is
> unusual or something that the diagnosis it's difficult to find or there is a
> problem with management'* (Int.No.74/Q.17.3).

The presentation of cases may be organized by one consultant for his particular
department (Int.Nos.60;78;79/Q.17.3) or it may be a joint event with the dental school
for example the *clinical pathological conference* held every week during term time
(Int.Nos.57;58;62;63;68/Q.17.3). This meeting is jointly run by the departments of
oral surgery and oral pathology from the dental school and senior members of the
hospital staff (consultants and senior registrars)[13].

The journal club is a quasi-formal meeting to talk about new developments in each
speciality (Int.Nos.63;72;74-82/Q.17.3;18.1;18.3):

> *I: How is the journal club organized?*
> *R: Every member of the journal club is allocated a journal, which is respon-
> sible for sort of reading through and to pick up any interesting articles or
> articles that other people would think would be interesting, regarding new*

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[12]See page 73.
[13]See Formal interactions of Talking in academic staff, page 239.

developments and techniques. We all collectively look at the "Journal of Prosthetic Dentistry". [They meet for about an hour at lunch time once a week; house officers, senior house officers and registrars attend the club] (Int.No.78/Q.19.3).

R: Journal Club in Oral Surgery and Journal Club in Restorative Dentistry.
I: Do they work in similar ways or are they different?
R: They are different.
I: Which is the difference?
R: The Oral Surgery Journal Clubs are run in slightly more formal basis, where a single paper would be presented each time by one person and then discussion would follow on the contents of the paper and the ways that relates to what we are going to do, what's going to change... as a result of what we've learnt. The Restorative Journal Club is less formal and maybe a number of people would present information from a number of papers, usually shorter papers and less complexity and so we would discuss the techniques if that is the case, or the methods that they are describing. And in addition individual patients, cases that we would discuss in a clinical level, treatment planning for patients, the ways to proceed in difficult treatments, where we would want advice.
I: Who attends these journals clubs?
R: The Oral Surgery Journal Club is attended by professors, consultants, honorary consultants [senior lecturers] *senior registrars, senior lecturers, registrars, shos* [senior house officers], *occasional outside practitioner. The Restorative one is attended by consultants, registrars, senior house officers, house officers.*
I: Do the house officers attend the Oral Surgery one?
R: No.
I: and the postgraduate students?
R: No, they go to the clinical-pathological meetings.
I: Do you attend them?
I: Yes, I do.
(Int.No.75/Q.18.3)

This particular form of interaction for **Talking** is related to two other strategies **Reading** and **Using the library**. Whilst those who attend the journal club seek information from face-to-face discussions, those who chair the particular session have sought that information from a journal they receive or from articles found at the library.

Talking is a way of exchanging information – both seeking and giving it – at committee meetings. Senior staff have to attend meetings of the different committees involved with the running of the hospital. They also attend meetings of various committees and boards of the associations they are members. However, they did not describe this pattern of interaction in detail. Since most of them did not identify information problems related to hospital management[14], they could not specify any strategy (Int.Nos.57-85/Q.19.3).

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[14]See page 120.

Talking is a preferred initial strategy in clinical situations because by asking a colleague they gain both factual information and the colleague's own experience:

'Because hopefully they used the technique and they know what they are talking about' (Int.No.66/Q.11).

'I rather learn about a clinical management situation from a person who has actually dealt with it than from a textbook' (Int.No.68/Q.11).

The implicit trust they put on senior colleagues is another reason to start by seeking information in this way:

'It is the advantage of meeting in a teaching hospital there are lots of people with specialized interests that can give me the information, it is a short circuit system' (Int.No.73/Q.11).

'Probably because I work in hospital, and there are always people around, you know, people with more experience, and I am always asking things to confirm if I've made the right decision or asking information about how do I treat someone or manage something' (Int.No.74/Q.11).

'Because it is the easiest to obtain, you can get that in a matter of couple of minutes and I trust it' (Int.No.82/Q.11).

Finally **Talking** is perceived as less time consuming and more flexible than **Reading** and **Using the library**:

'Because it is readily available, it is quick I can walk across the room and ask a colleague on a particular query, whereas I have to go to the library or a bookcase or a store of journals to find the information there' (Int.No.75/Q.11).

'I think it is a little bit easier to ask someone than it is trying to find things in a book sometimes. They can have perhaps more intelligent ideas' (Int.No.79/Q.11).

Enquiring

This strategy is implemented by hospital staff to seek clinical information about patients and administrative information about the day to day running of the hospital (See Figure 7.5 and Figure 7.6).

Hospital staff do not rely exclusively on **Enquiring** to obtain a description of the medical/dental condition of the patient (See Figure 7.5). **Enquiring** is the initial strategy only when it is necessary to open a file for a new patient who has come to the dental hospital on his/her own. Otherwise the initial strategy is a combination of **Reading** and **Enquiring**: reading the patient's file and then enquiring from the patient. If the description of the patient's clinical history is not complete after the opening dialogue and the study of the file, **Enquiring** is applied to seek further information from a variety of other professionals. Hospital staff contact medical colleagues from any speciality (immunologists; pathologists; microbiologists; radiologists; paediatritians; plastic surgeons) to enquire about medical histories and conditions or

about medication and drug interaction. As an alternative to the latter they may contact drug information services. Hospital staff contact other health professionals, for example speech therapists, dietitians or physiotherapists for dealing with cleft palate patients or patients with a fractured mandible. Also they need to make enquiries from lawyers and police officers to report on insurance claims and criminal cases. This last instance is the only one when the enquiries may occur in both ways, i.e. hospital dentists contact police officers or lawyers and they both enquire from the former as well. In all the situations related to clinical information the enquiries are made over the telephone, in writing or in person (arranged meetings).

Enquiring is also implemented to seek information from architects, accountants, administrators, engineers, etc. regarding different aspects of hospital management. The enquiries are made person to person (See Figure 7.6). However, hospital staff have provided less detailed descriptions of information needs, strategies and interaction than in other situations, because this area of their work is perceived as the least important[15].

Individuals from other professions and occupations are always the associated information source for **Enquiring**, whilst organizations outside Dentistry are very rarely selected (See Figure 7.7).

As they prefer to direct their enquiries towards individual experts, hospital staff make very little use of information services in the medical/dental field (See Figure 7.8). Only the Local Health Authority and the District Drug Information Centre are likely to be contacted.

The Local Health Authority is usually contacted to seek information about regulations and other administrative matters. However, as hospital dentists have never been very clear regarding that kind of information, the Local Health Authority was never specifically mentioned in the context of any situation; the only data is that 36% of the interviewees have contacted it at least once.

But this is not the case regarding the use of drug information services. Hospital staff are more likely to seek drug information than general dental practitioners, because routinely they treat medically compromised patients. **Reading** may be one strategy and **Enquiring** from the medical practitioner in charge of the patient another[16], but unlike the general dental practitioners, hospital staff may approach the District Drug Information Service based at the Royal Hallamshire Hospital; seven interviewees have contacted that service at least once:

> R: It was information about drugs to be used with a patient, what's the most appropriate.
>
> I: And how did you obtain the information?
>
> R: From the Drug Information Service at the Hallamshire[17].
>
> I: What specifically did you ask them and what did they give you?
>
> R: I was asking about... I wanted to use a drug in liquid form and the particular one I wanted to use they didn't do it in liquid form so I wanted to know what was the best alternative so I just phoned them up and asked what I wanted to know and they told me what the suitable alternative was. (Int.No.81/Q.1).

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[15]See page 120.

[16]See 7.3.2.

[17]The District Drug Information Service at the Royal Hallamshire Hospital.
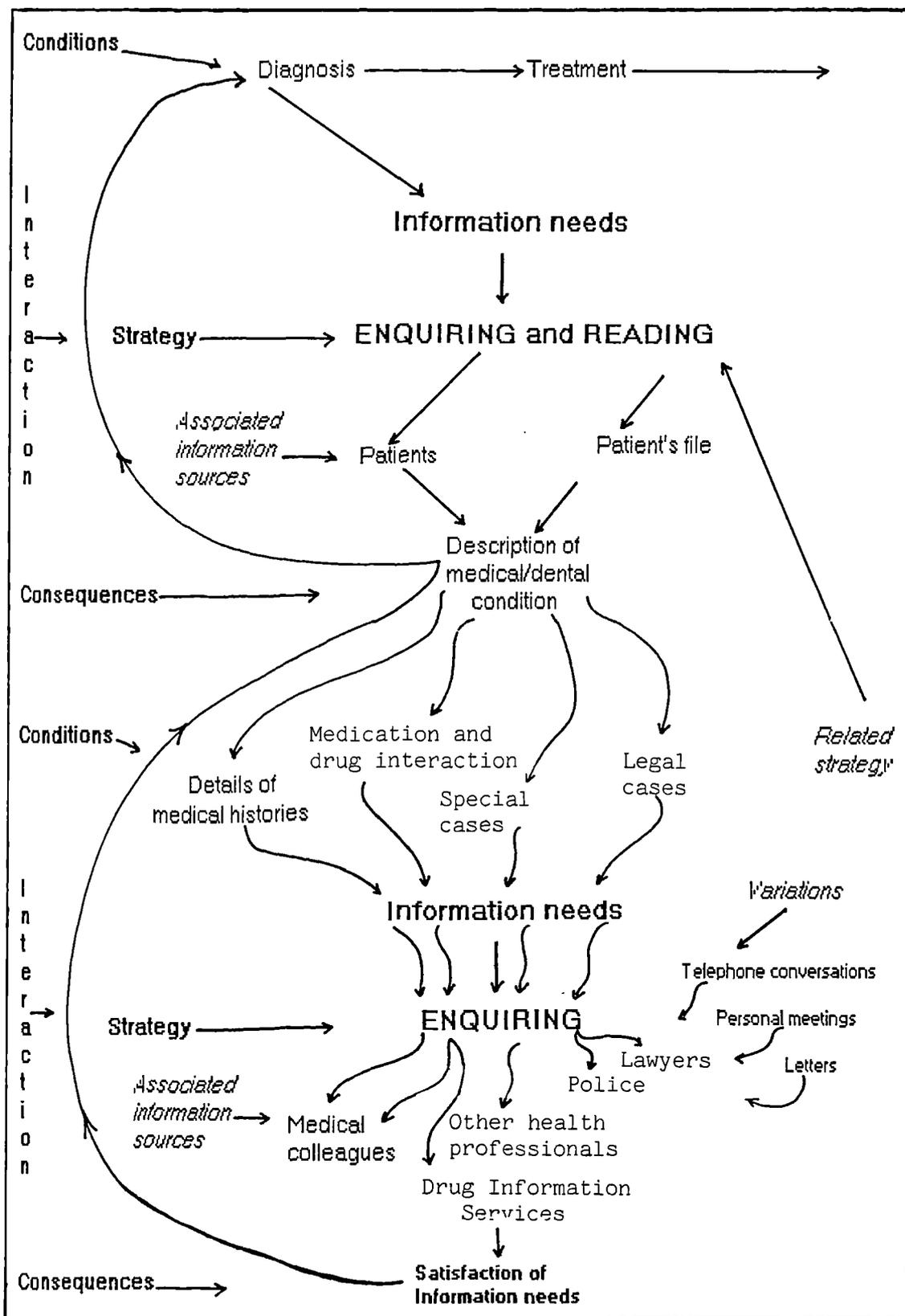
Figure 7.5: Enquiring as a basic strategy to seek patients' information - Hospital staff
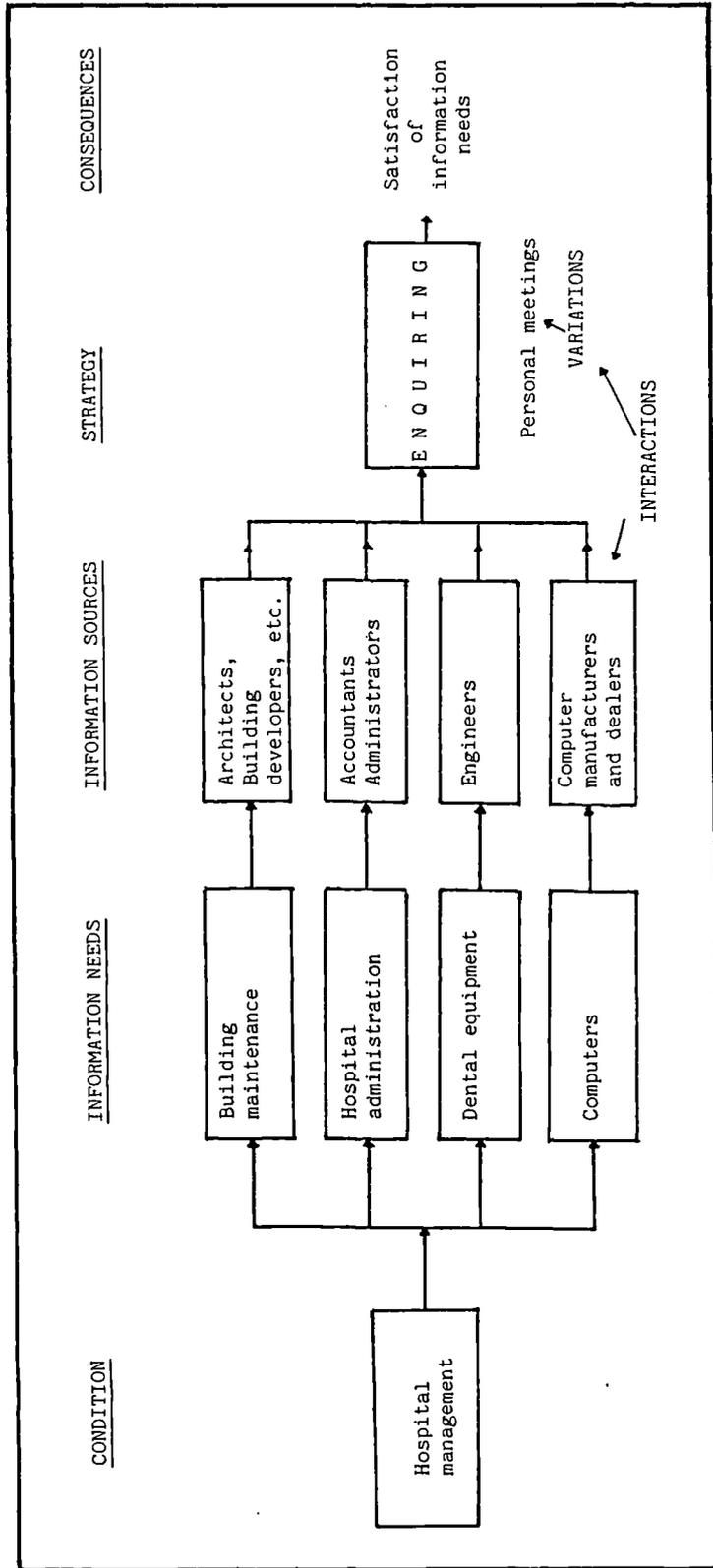
Figure 7.6: Enquiring as a basic strategy to seek management information - Hospital staff
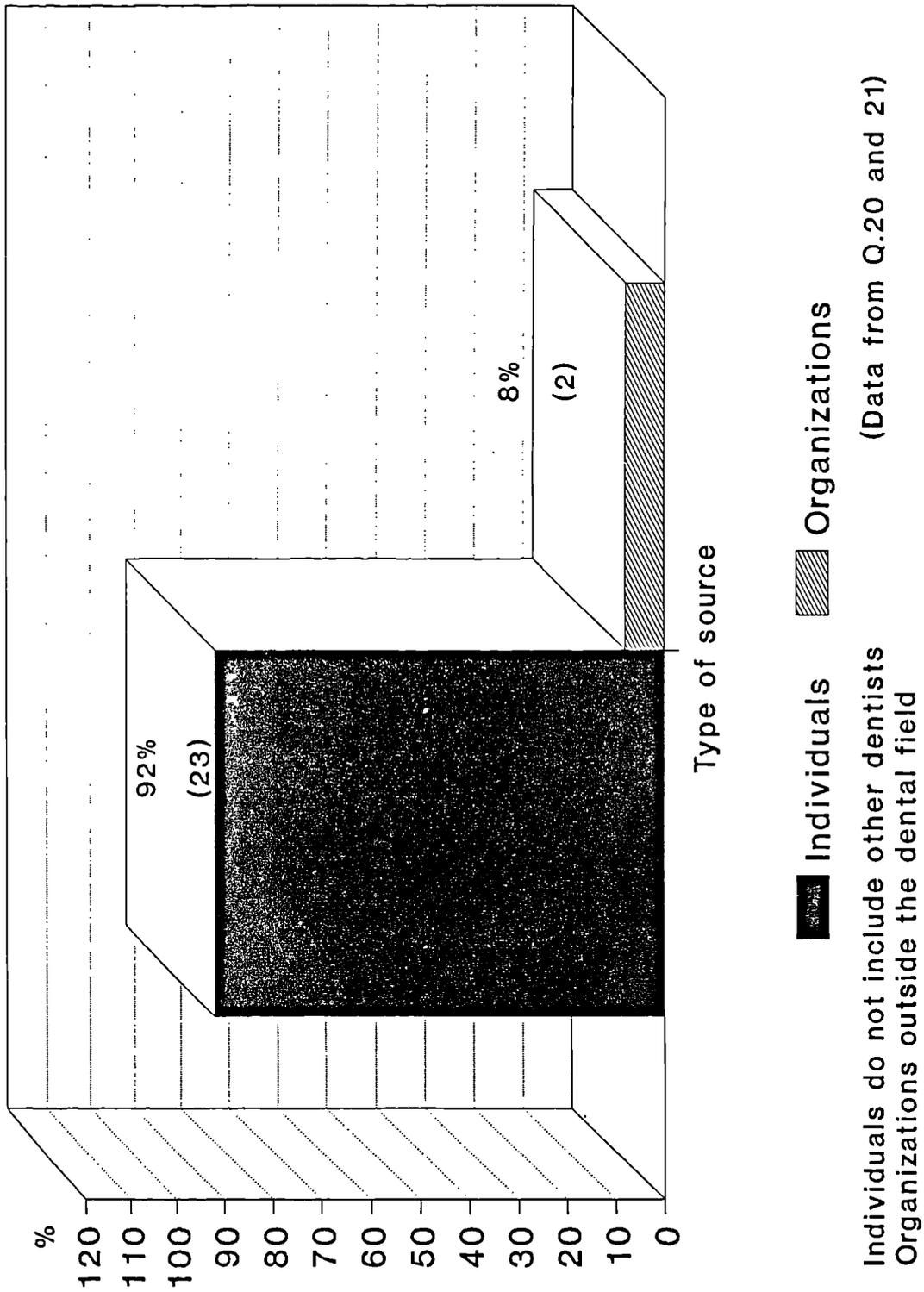
Figure 7.7: Information sources for Enquiring - Hospital staff

(Data from Q.35)

FDI: Federation Dentaire Internationale
LHA: Local Health Authority
DDIC: District Drug Information Centre
RDIC: Regional Drug Information Centre
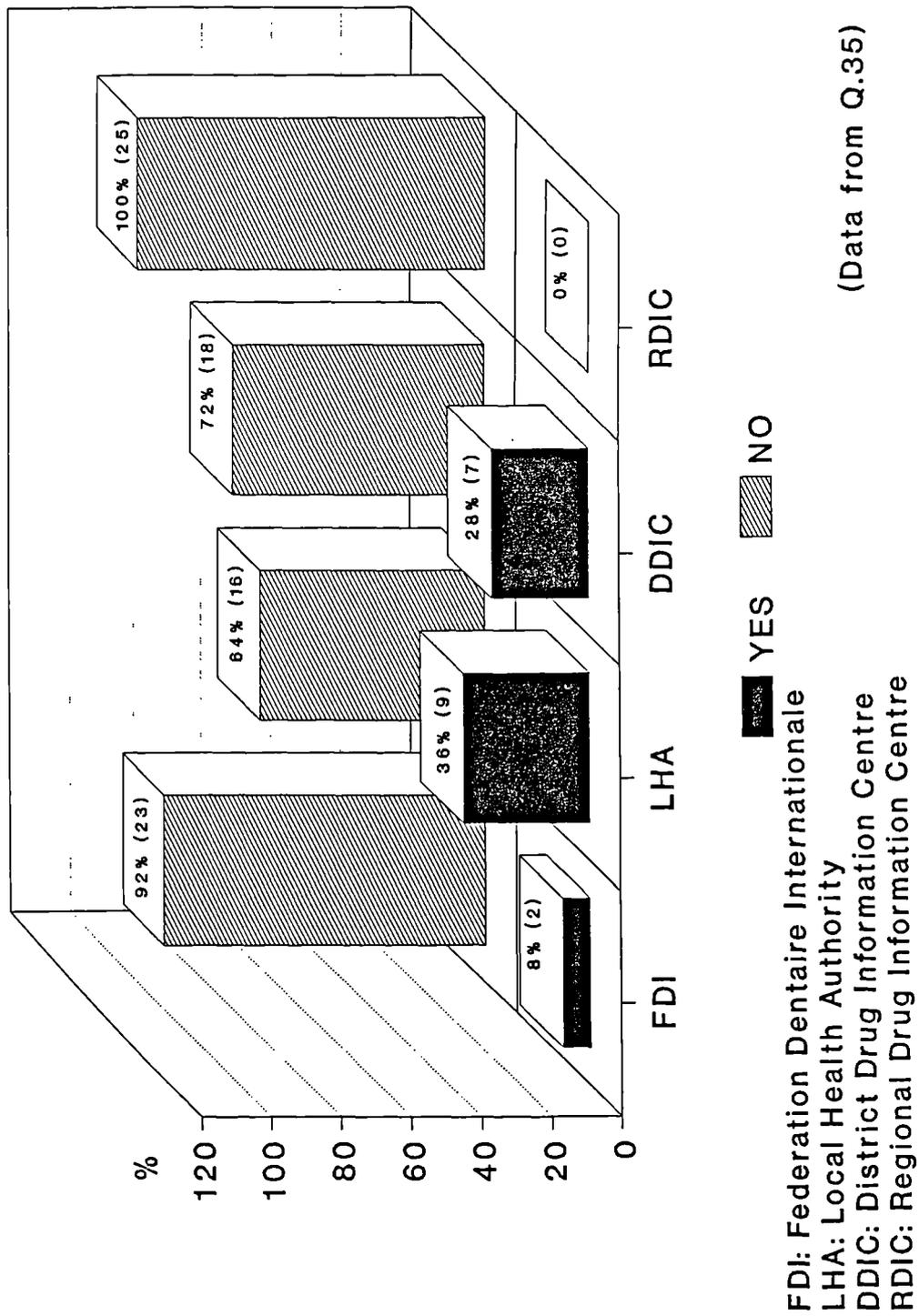
Figure 7.8: Use of information services by hospital staff

Table 7.11: Frequency of attendance at continuing education events

Event[a]	Non-attendance		Irregular attendance[b]		Regular attendance[c]		Intensive attendance[d]	
	%	()[e]	%	()	%	()	%	()
Courses	32	(8)	28	(7)	32	(8)	8	(2)
Conferences	12	(3)	4	(1)	20	(5)	64	(16)

[a]Data from Q.15 and 16.
[b]No specific frequency or less than once a year.
[c]At least once or twice a year.
[d]More than twice a year.
[e]Values in () indicate frequencies.

Enquiring is implemented only if it is unavoidable; it is very rarely applied on its own and it is not preferred as an initial strategy by hospital staff.

Attending/organizing continuing education events

Top and middle rank hospital dentists are involved in postgraduate training so they both attend and organize continuing education events. These events are either post-graduate courses or conferences and lectures in their respective speciality (See Figure 7.9).

This strategy is applied to meet information needs created by three conditions: learning or teaching new techniques relevant to their speciality, keeping up-to-date in the same field or preparing for the examinations for the Fellowship in Dental Surgery.

Conferences are preferred to courses. The majority of the interviewees attends more than two conferences but less than two courses a year (See Table 7.11). This difference is related to the professional age and the job category of the interviewees. Most interviewees were either consultants with more than 20 years in practice who found formal courses less necessary or house officers who graduated less than a year ago, who did not feel there was anything new to learn yet.

Hospital dentists need special leave of absence to attend these events; this has an effect (i) on the frequency of attendance because the service at the hospital should be covered all year round and (ii) on the selection of the events because the leave is granted only for events in the speciality. For example dentists in the Orthodontics Department would find it very difficult to attend courses or conferences on other dental specialities. Regular attendance at conferences gives hospital dentists fewer opportunities to go away on courses.

Very few hospital dentists prefer local events; three attend courses only in Sheffield, six attend conferences only in Sheffield and one only in the region. The majority of them attends events anywhere in the U.K. and distance has never been mentioned as an obstacle (See Table 7.12).

Attending/organizing... is related to Reading and Using the library because journals – either their own ones or those from the library– are one source of information about courses and conferences[18]. It is also associated with membership of professional

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[18]See Int.No.74/Q.14.3 page 130.

Table 7.12: Willingness of hospital staff to travel

Event[a]	Sheffield[b]		Region[c]		U.K.[d]	
	%	()[e]	%	()	%	()
Courses	17.7	(3)	0.0	(0)	82.3	(14)
Conferences	27.3	(6)	4.5	(1)	68.2	(15)

[a]Data from Q.15.2 and 16.2.
[b]Attendance at local events only.
[c]Attendance at events in the Trent Region and the North of England, including Glasgow and Edinburgh.
[d]Attendance at events anywhere in the United Kingdom.
[e]Values in () indicate frequencies.

associations. Again the pattern of membership of professional associations is similar to that of journals and magazines in **Reading** (See Table 7.8 and Table 7.13). The majority of the dentists in this group have joined the *British Dental Association* and one or more special associations. The range of associations reflects the complete spectrum of dental specialities at the dental hospital. No membership of a professional association is exceptional in this group, only one interviewee did not join any (See Table 7.13).

Attending/organizing... is invariably linked to postgraduate training. As such it can only satisfy long-term information needs. Therefore it is never selected as an initial strategy; **Reading, Talking** and even **Using the library** provide more immediate responses.

Watching

In the case of hospital staff **Watching** is a strategy implemented for communicating information rather than for seeking it.

The majority of the interviewees (22) use some kind of audiovisual materials (See Figure 7.10). These materials are mainly videos or slides (See Figure 7.11).

Slides and overhead projections (transparencies) are commonly used as aids to their lectures (Int.Nos.57;58;59;60;62;63;64;66;68;70;73;83;84;85/Q.27.1):

> 'Videotapes; tape-slide sequences. I tend to lecture from acetates when I talk; occasionally promotional literature' (Int.No.63/Q.27.1).

Slides are not only important for preparing lectures but also for recording cases; hospital staff develop over the years slide collections where they have recorded all the interesting cases they have dealt with. They retrieve information from these files in the form of examples for their lectures and also if they want to show the patients what a given treatment can possibly do:

> 'I do have some patients that I treated in the past ... which I thought ... maybe for later years, maybe to demonstrate to patients the kind of things that can be done, a sort of before, after and various stages in between' (Int.No.78/Q.27.1).

Table 7.13: **Membership of professional associations**

Associations[a]	HS	
	%	()[b]
British Association of Oral and Maxillo-Facial Surgeons	32	(8)
British Dental Association	68	(17)
British Endodontic Society	4	(1)
British Medical Association	8	(2)
British Paedodontic Society	20	(5)
British Society for Dental Research	4	(1)
British Society for Dental Research-Implantology Group	4	(1)
British Society for Restorative Dentistry	12	(3)
British Society for the Study of Orthodontics	16	(4)
British Society of Dental and Maxillo-Facial Radiology	12	(3)
British Society of Dentistry for the Handicapped	4	(1)
British Society of Periodontology	8	(2)
Canadian Dental Association	4	(1)
Consultant Orthodontists Group	4	(1)
Consultants in Restorative Dentistry	4	(1)
Fluoridation Society Limited	4	(1)
Hospital Consultants and Specialists Association	4	(1)
International Association of Dento Maxillo-Facial Radiology	8	(2)
International Association of Oral and Maxillo-Facial Surgeons	4	(1)
Royal Society of Medicine	8	(2)
South Yorkshire Paedodontic Society	4	(1)
No membership	8	(2)

[a]Data from Q.12.
[b]Values in () indicate frequencies.
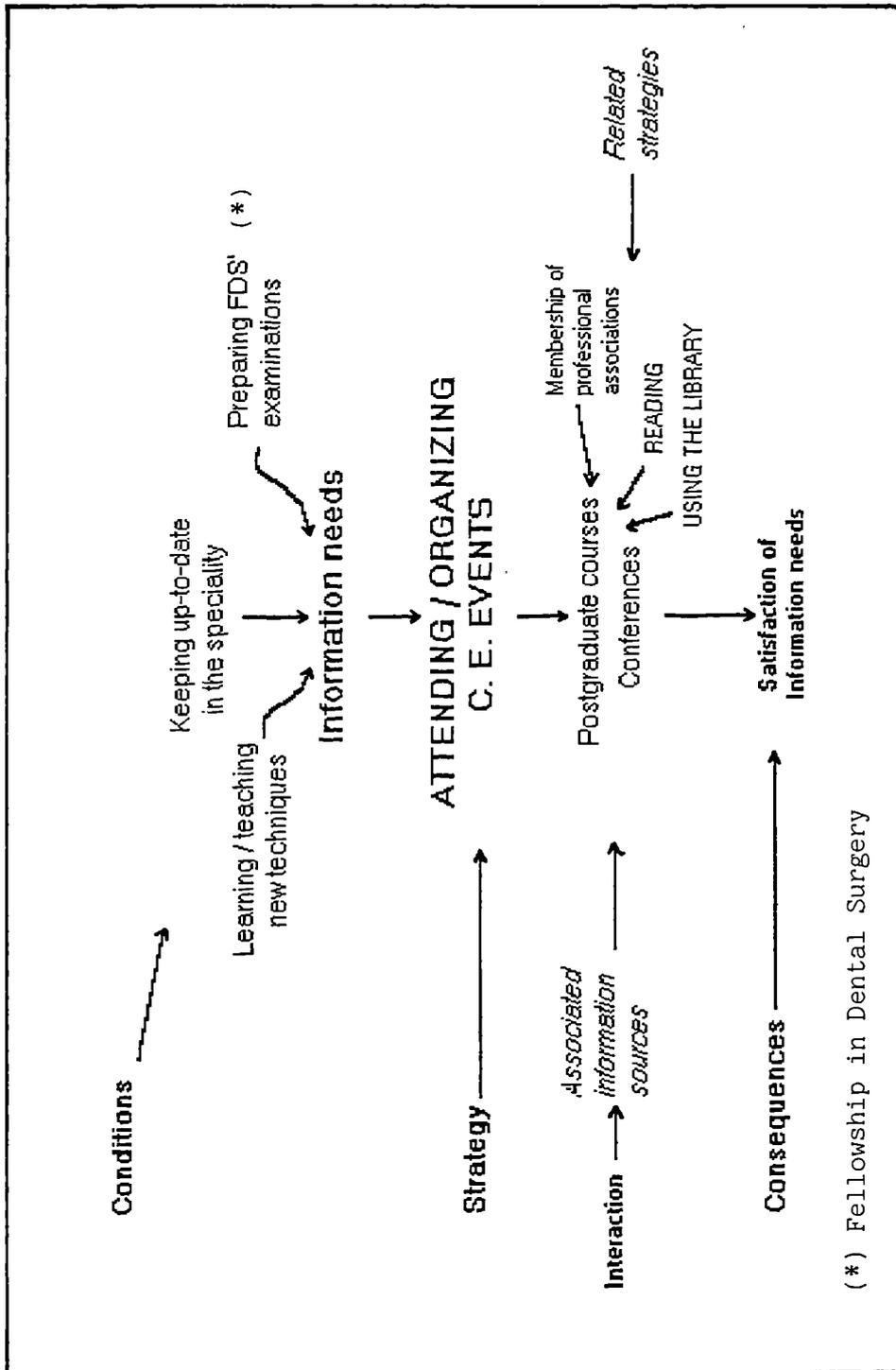
Figure 7.9: Attending/organizing continuing education events as a basic strategy for hospital staff

NO 12%

(3)

YES 88%

(22)

(Data from Q.27)
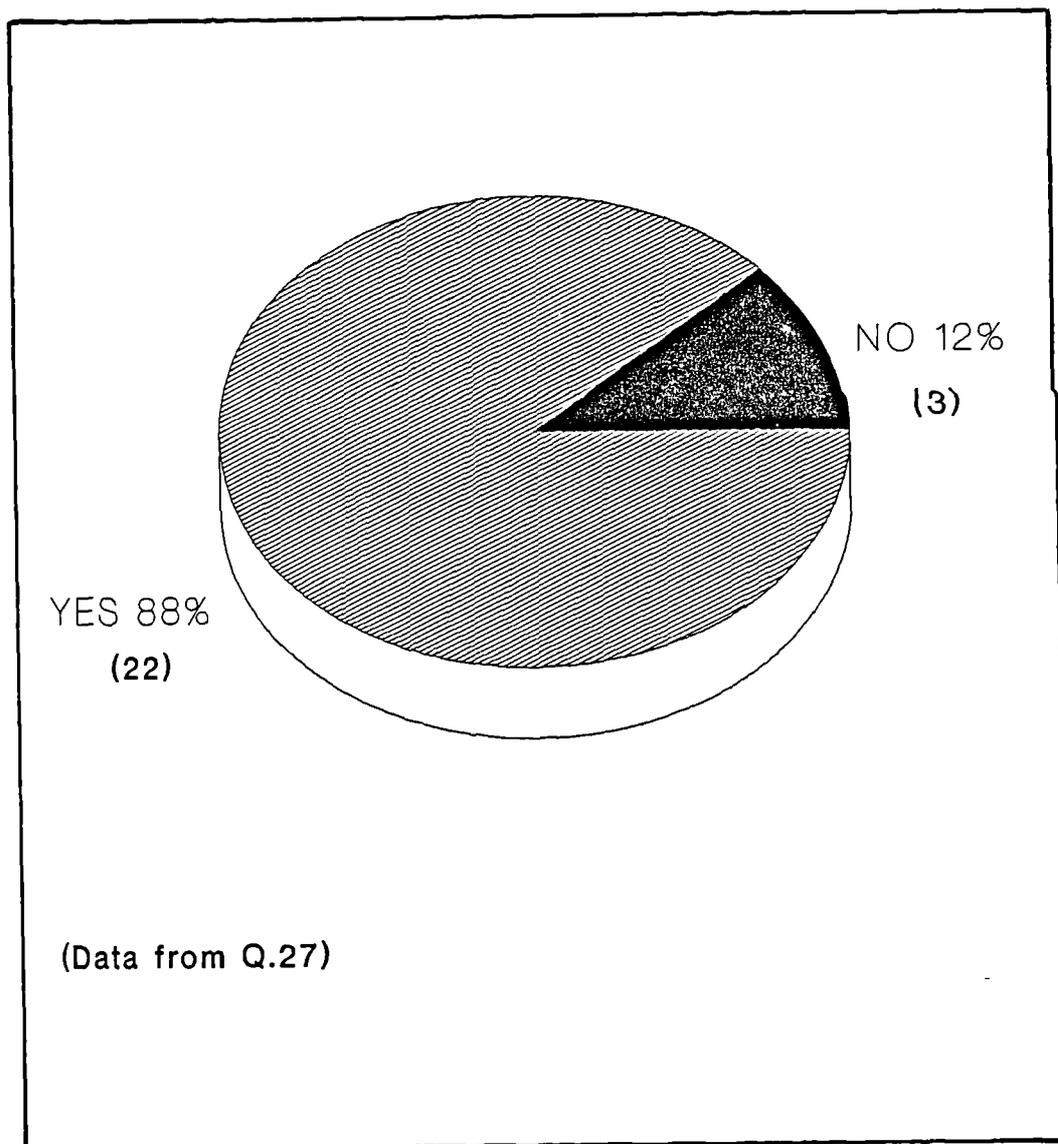
Figure 7.10: Use of audiovisual materials by hospital staff
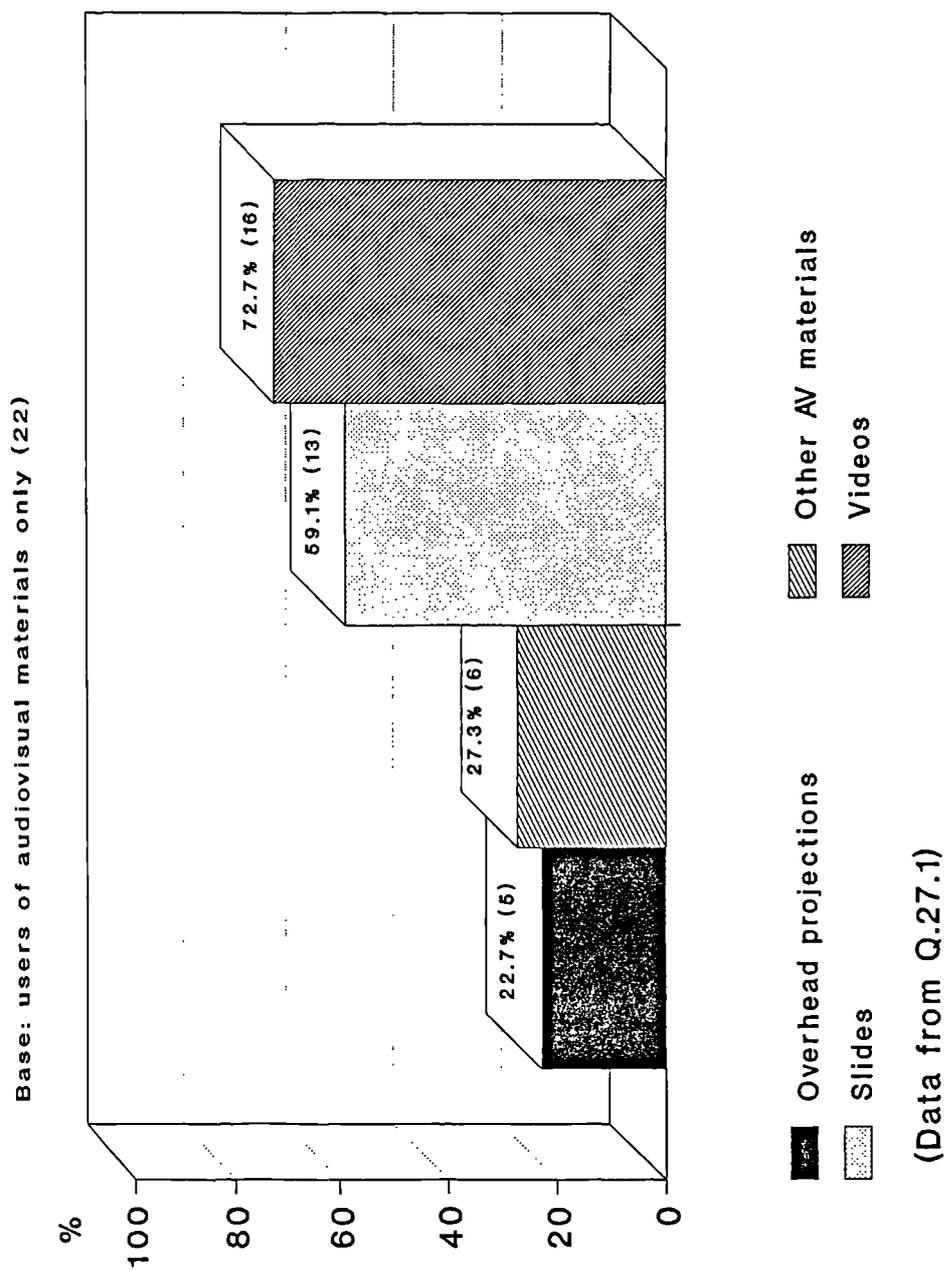
Figure 7.11: Types of audiovisual materials used by hospital staff

Hospital staff themselves produce most of the audiovisual materials that they use:

'Usually we get them made ourselves, sometimes borrowed from colleagues if they have an approppriate slide' (Int.No.70/Q.27.2).

The other important sources of audiovisual materials are the collection of videos at the University Medical and Dental Library and the departmental collections at the dental hospital or dental school.

Junior hospital dentists have mentioned videos as an important teaching aid during their undergraduate training (Int.Nos.77;79;80;81;82/Q.27):

'It is mostly videos that are been made by Sheffield University predomi-nantly for the Oral Surgery part of the course. There was quite a lot of teaching done by using videos to give you the basic information and then that was backed up by somebody showing you what to do'
(Int.No.81/Q.27).

Hospital staff acknowledge the value of audiovisual materials to teach specific techniques:

'It's like a teaching aid, mainly in Oral Surgery here. Certain techniques you can read about, but if you can go and watch them it makes things easier' (Int.No.82/Q.46).

'There are various video-tapes with demonstrations and I think that no matter how good an explanation is in a book, I think that the best thing is when you actually see it' (Int.No.78/Q.46).

As one interviewee said: *'... one image is worth one thousand words' (Int.No.83/ Q.46)*. **Watching** is perceived as a better strategy than **Reading** or **Talking** but for all that, **Watching** is very seldom used purposively to seek information. Hospital staff receive information in audiovisual form when they attend courses or lectures; they convey information in the same way when they lecture. However, if they need to seek information for a specific situation, **Reading**, **Talking** or even **Using the library** invariably come first[19].

It is inevitable to wonder why if the strategy is in principle so highly regarded, it is so little implemented for actual information-seeking. Despite the facts that they rely on their self-produced collections of audiovisual materials, that the university library has an extensive collection of dental videos and that both the dental hospital and dental school are actively involved in the production of videos for Dentistry, information is not produced in audiovisual form as widely as it is in printed form:

R: Sometimes it is more difficult to get that, I think the reason for it, it is that ... the number of people who are actively participating and producing the videos is not that great, it's becoming larger, but more people are active in research.
I: What sort of problems did you find when you wanted to get it?
R: It's really actually where to go and search for it.
(Int.No.63/Q.47).

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[19]See 7.3.2.

A single image might be worth a thousand words but it is also worth a couple of hundred pounds if it comes in a video commercially sold. Production of audiovisual materials in video form is still sparse; there is nothing like the range of well known journals, covering each speciality and being published throughout the year. For all its technical qualities information in audiovisual form is not as accessible as a journal taken from the shelf or a colleague sitting by at coffee break. So it is not surprising that despite its value, **Watching** is a strategy that complements others and appears in combined and complex patterns of information-seeking except for teaching.

Using the library

This is an important strategy in the overall information-seeking behaviour of hospital staff. Only one interviewee said that she could not remember when was the last time she had been to a library (Int.No.66/Q.33). All the others (24) use library services regularly (See Figure 7.12).

Hospital staff prefer the University Medical and Dental Library based at the Royal Hallamshire Hospital, a ten minutes walk from the Charles Clifford Dental Hospital. The part time consultants also use the medical libraries at the general hospitals where they are based. A small group (9) uses the British Dental Association Library as well (See Figure 7.13).

The majority of interviewees are fully registered users of the University Medical and Dental Library (HHL) with a currently valid library ticket; two only use the library for reference purposes without a library ticket although they know that they are entitled to one; and one part-time consultant has never joined it because he comes to Sheffield only once a week and prefers the library at his hospital base (See Figure 7.14).

Some of them pay weekly visits to the library, with or without any specific reason apart from browsing new publications:

> *'Well, routinely every week I go there* [HHL] *to read the journals that I specified and to search for... for interesting articles, either interesting or relevant to me. Also I search for papers that would be relevant maybe to a particular case, an unusual case'* [The respondent reads 'British Dental Journal', 'Journal of Prosthetic Dentistry', 'British Medical Journal', 'New Scientist', 'American Dental Journal' and the 'Australian Dental Journal' regularly (See Q.23.1).] (Int.No.65/Q.33).

> *I: I use it* [Medical library at a general hospital] *most weeks to go and see if there are any new books; to get up-to-date with the journals.*
> *I: Do you use any other services?*
> *R: No, I don't use it for literature searches or anything like that.*
> (Int.No.84/Q.33).

Other hospital dentists go to the library for more defined purposes and the frequency of their visits is more variable:

> *R: I used to go in there to read the current journals before we've got them in the Department. I also used it a lot when I was studying for my Orthodontics Diploma.*

I: When was that?
R: Nine months ago.
(Int.No.64/Q.33).

[When she has to prepare her presentation for the journal club:] *'I go there, find the journal, maybe read it there or take away. Sometimes I use the microfiches* [the microfiche catalogue] *to locate a book or I ask the librarian'* [She has not used any other service of the library.] (Int.No.76/Q.33).

R: If I need articles on certain techniques, I get them from the journals or the books over there [HHL].
I: How do you start looking for the articles about the techniques?
R: Something like the 'Index Medicus' or the Dental ["Index to Dental Literature"].
I: When you find the articles what do you do: do you read them there, do you borrow the journals or do you photocopy what you like?
R: It depends how much time I have. Sometimes if it is a good article you photocopy, sometimes if it isn't a very good article you put it back on the shelf. If I'm doing it for a reason, then I would probably photocopy.
(Int.No.79/Q.33).

R: I am using it [HHL] *a lot now to find out job advertising. Also I used to use it a lot as student. Now I occasionally use it for this journal club we have, to look at current journals.*
I: Which services of the library do you use?
R: Borrowing books, photocopying, borrowing journals. That's all.
(Int.No.82./Q.33).

One variation of this strategy is scanning journals either at random or for specific articles:

R: I go there quite often... [HHL]
I: and what do you do when you go there?
R: Usually, when I go there, I'm looking at journals, that's the main thing. I borrow books occasionally. Basically it's journals that I need.
I: Do you use any other service of the library?
R: Yes, they send me photocopies of the contents pages of the journals and obviously I need interlibrary loan services. That's really the main thing.
(Int.No.60/Q.33).

R: Usually I'll go straight to the journals section [HHL], *for the journals or the publications or the textbooks, if I have a particular article in mind. Maybe not a particular article but a particular subject and I'll look through the current journals.*
I: Do you read there, do you take notes or photocopies?
R: Yes.
I: What do you do?
R: All three.

I: Do you use any other service of the library?
R: No, I haven't yet.
(Int.No.75/Q.33)

R: Last Friday, last Friday afternoon... I looked up the current [issues of]
"European Journal of Orthodontics", "Journal of Clinical Orthodontics",
a specific author in the "British Journal of Orthodontics" of this year for
a specific paper that a colleague had mentioned to me on expansion of
archers. I found it and then I had a reference in that paper, at the end
of that paper which was very interesting and I photocopied and I went and
asked the staff, I hadn't used the complex photocopier there. [HHL]
I: Do you use any other service of the library?
R: Yes, I have quite an expanding collection of photocopies of different pa-
pers that are interesting to me. I get them usually in two ways by writing to
the British Dental Association Library. They are very good on particularly
older papers, and they have really a better service than the Hallamshire li-
brary, excellent service. I also had in the past used our own library at... [he
is based at a general hospital in the region] *They although haven't got the*
material, they have obviously access through the national library [British
Library Document Supply Centre]. *They would get me again photocopies.*
It takes longer.
(Int.No.85/Q.33).

Another variation is carrying out formal literature searches:

R: The Medical Library [HHL] *I use it for searches, they have the Medline,*
I think it is, they are very very good if you want to do a search.
I: You told me that you also have made manual searches?
R: Yes, yesterday lunch time I was in there just checking on some refer-
ences rather than borrowing books, it's probably not a main feature because
most of the books I want I have them anyway. I borrowed a thesis, but
that's not the main use.
I: Do you use any other service of the library?
R: No.
(Int.No.70/Q.33).

R: I'm currently trying... in the process of writing a paper, a case report
for an interesting case that I saw. So I just did some background research.
I: How do you carry out this background research?
R; I'm looking in the 'Index Medicus',... in the subject index over the last
two years, three years, to see if anybody's written about the same thing, to
see if it is worthwhile producing a paper.
I: Do you use any other service of the library?
R: There is at the moment the computer search but I don't know how to
use it. [Medline in CD-ROM] *Once I get the time I've got to go to show*
me how to use it.
(Int.No.72/Q.33)

Table 7.14: **Formal literature searches**

Source[a]	YES		NO	
	%	()[b]	%	()
Index to Dental Literature	64.0	(16)[c]	36.0	(9)
On-line databases	40.0	(10)[d]	60.0	(15)

[a]Data from Q.38 and 41.
[b]Values in () indicate frequencies.
[c]Interviewees have used the "Index to Dental Literature" at least once during the last five years.
[d]Interviewees have requested at least one on-line search during the last 10 years.

R: It varies if I am looking for something that I know it's going to be in a particular journal, then I am going to that journal, if I am looking ... if I want to know where to get the information from a particular subject, say that I was doing an essay on something, then I usually go to the Index, the Dental Index... ["Index to Dental Literature"] *sometimes by asking the librarians where the best place could be to look.*
I: Do you use any other services in the library?
R: No.
(Int.No.81/Q.33).

Using the library is a strategy implemented by hospital staff to keep up-to-date, to find specific documents or to search literature on specific topics (See Figure 7.15). Almost always they seek information in printed form, that they need to read because of their clinical, research or academic work. They may go to the library to watch a video, but since the videos represent a very tiny collection by comparison with the comprehensive printed collection on Clinical Dentistry, this is not their main use of the library.

There are three main variations of this strategy. Hospital staff may carry out random subject searches, formal literature searches or document searches (i.e. they know the specific article or book they want to consult). When they seek literature at random, they regularly or irregularly scan the current issues of dental journals straightaway from the shelves (Int.Nos.58;64;65;68;75;77;83;84/Q.33). They may look for specific documents, whose references they have obtained from a previous paper, a colleague or the current awareness service of the library (Int.Nos.57;60;76;78;80;81;82;85/Q.33). Formal literature searches are carried out manually in the *Index to Dental Literature* and the *Index Medicus* or they ask the library staff to make an on-line search for them (Int.Nos.62;63;68;70;72;73;74;79;81/Q.33 and see also Table 7.14).

The main relevant printed current bibliographies are the *Index to Dental Literature* and the *Index Medicus*. Hospital dentists may use just the former, both of them or prefer the latter, depending on their speciality (i.e. an orthodontist will use only the *Index to Dental Literature*, an oral surgeon may prefer the *Index Medicus* and the rest may switch from one to another if the specific topic requires it).

Their replies do not indicate a detailed knowledge of the *Index to Dental Literature*, sometimes they even mistake it for the library catalogue:

YES 96%
(24)

NO 4%
(1)

(Data from Q.32)
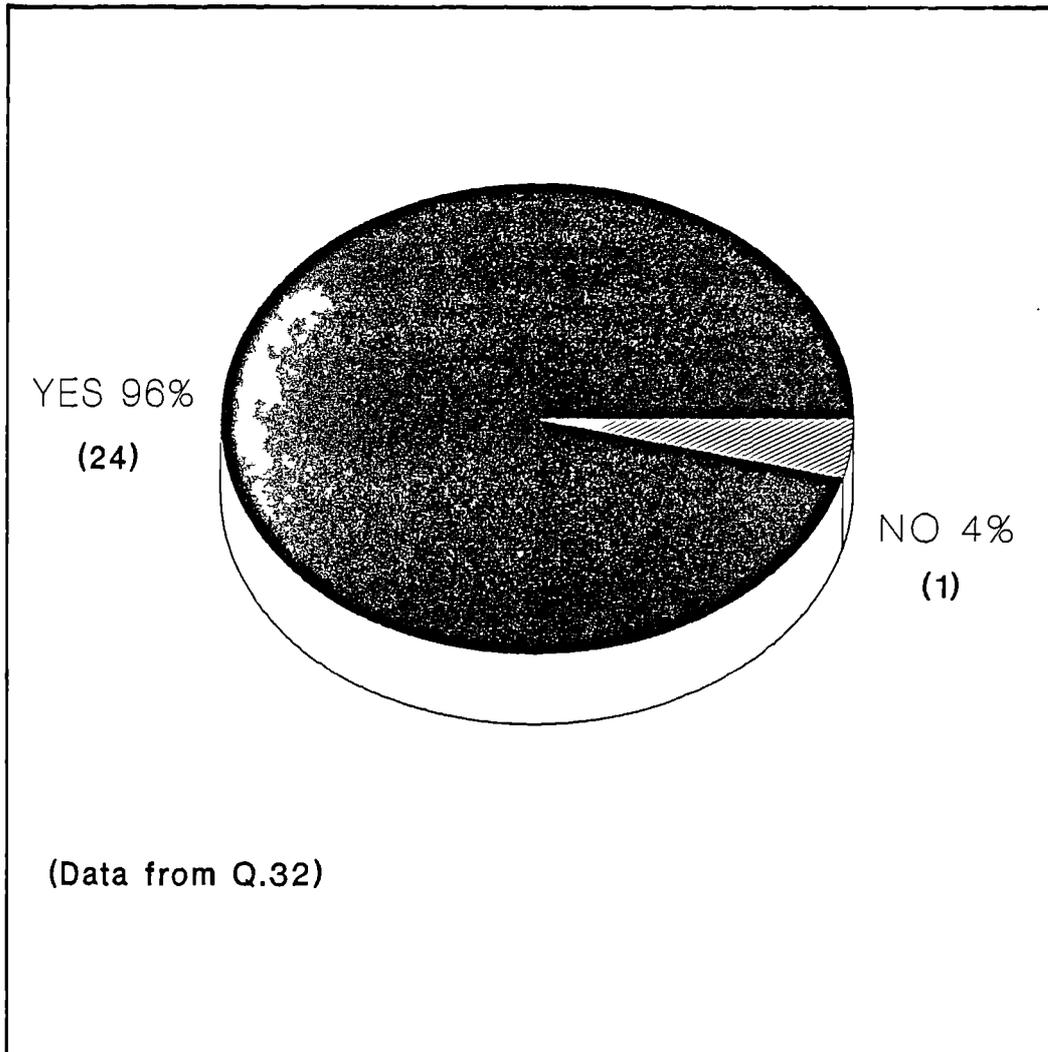
Figure 7.12: Current use of library services by hospital staff
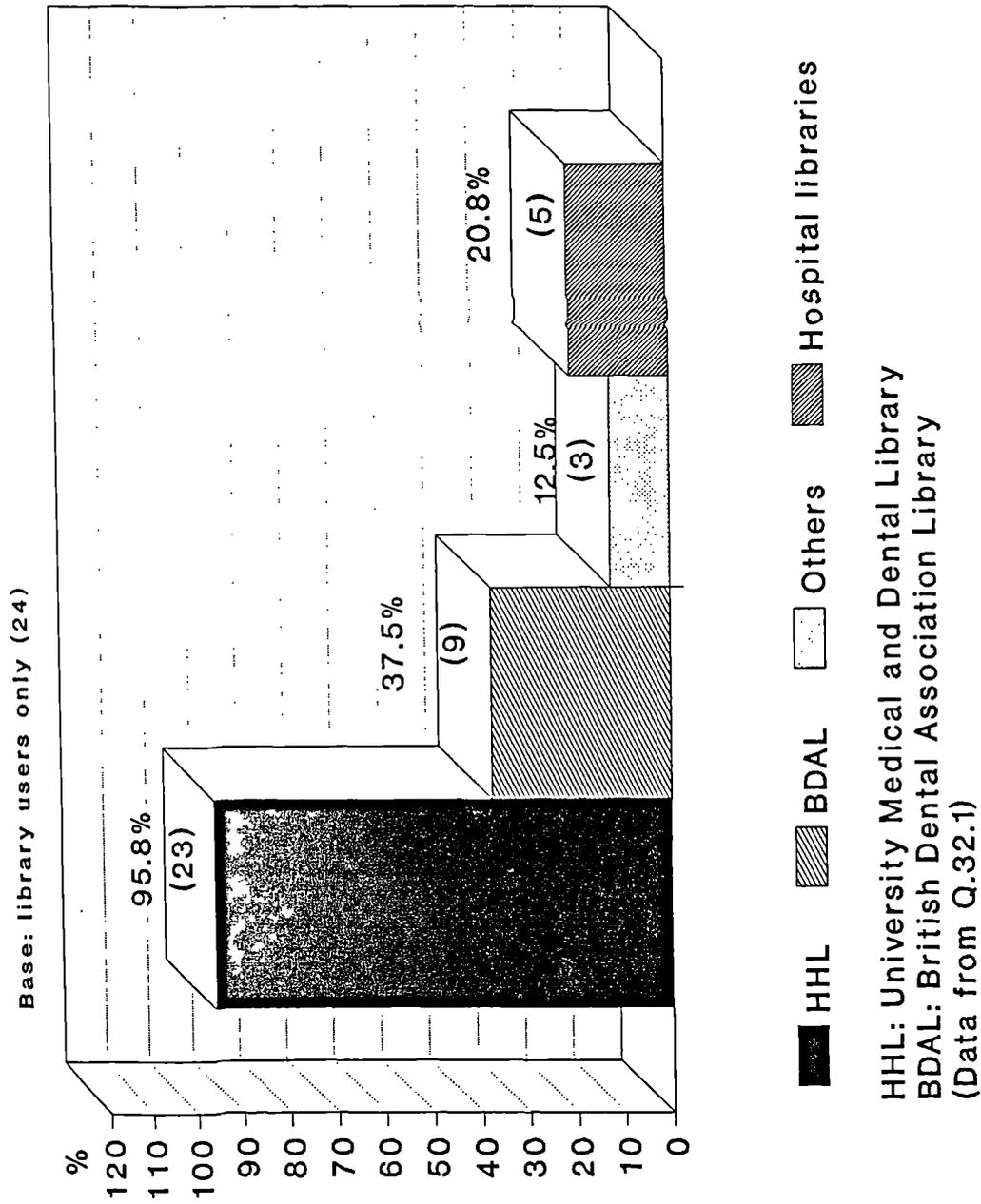
Figure 7.13: Libraries used by hospital staff

Active 88%

(22)

Never 4%

(1)

Visitors 8%

(2)

(Data from Q.37)
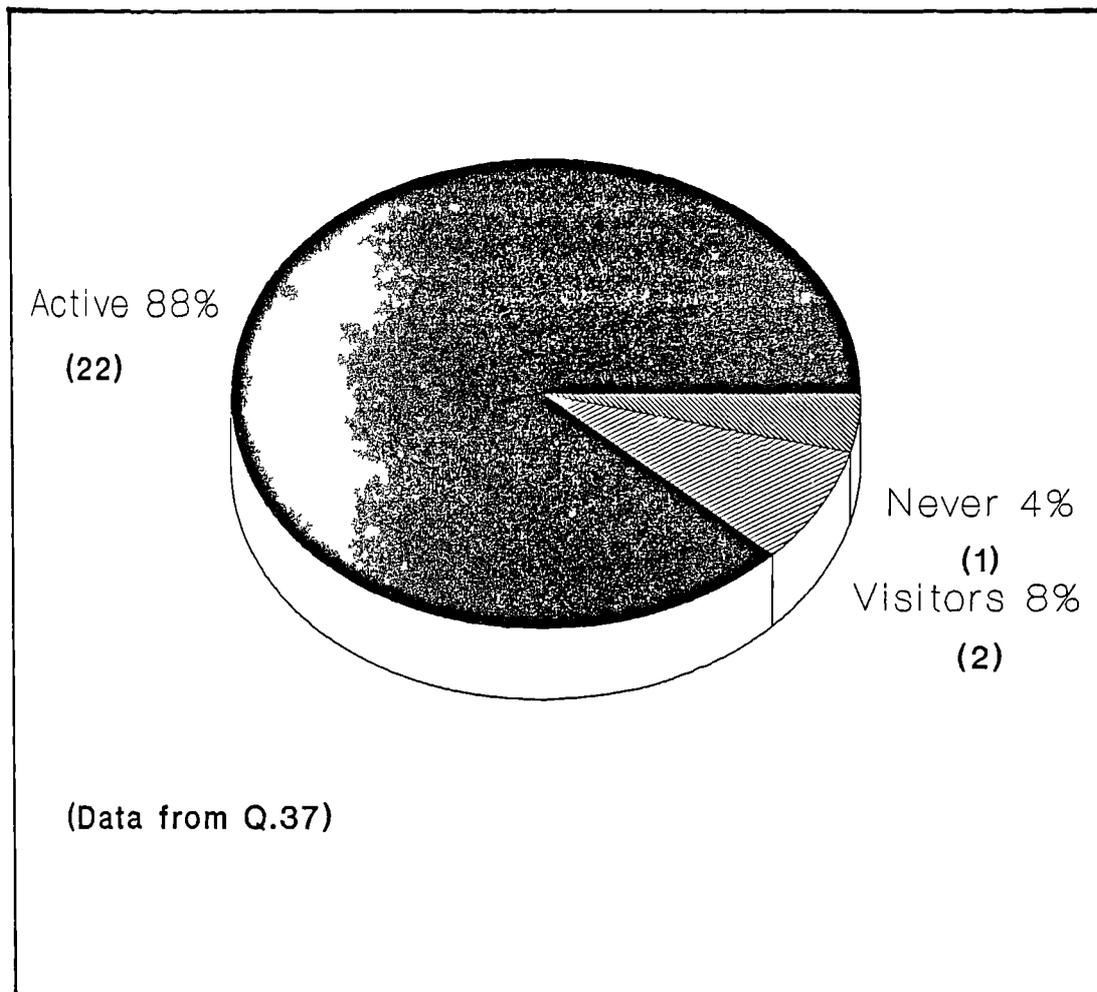
Figure 7.14: **Use of the University Medical and Dental Library (HHL) by** hospital staff
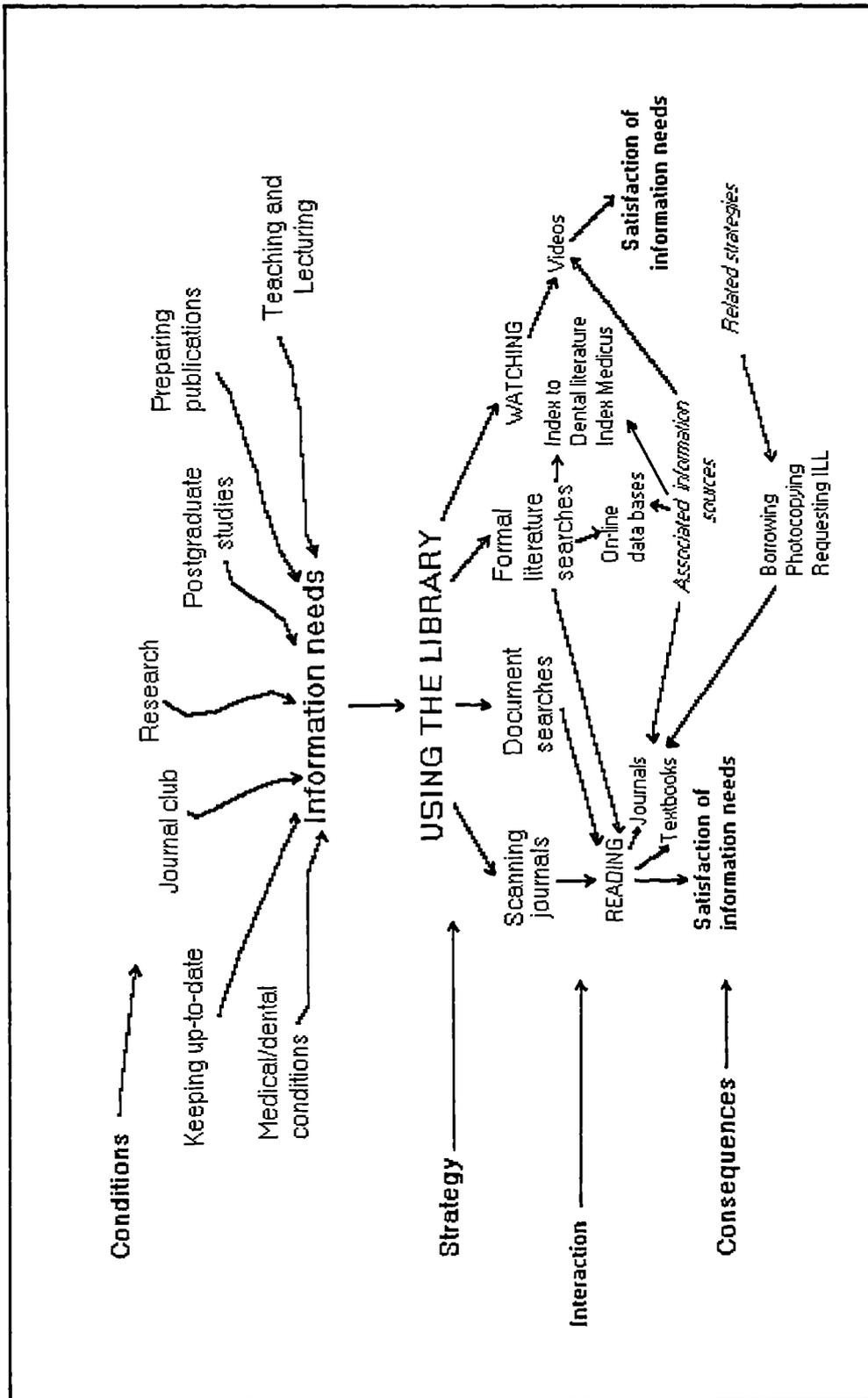
Figure 7.15: Using the library as a basic strategy for hospital staff

> R: I was using it yesterday actually to get a book out of... [respondent becomes very confused] information regarding in-patients management.
> I: You were looking for a book or for articles?
> R: For a book.
> I: And how did you look for the book?
> R: Just looking at the microfiches.
> I: No, but you are confused, I am asking if you have ever used the 'Index to Dental Literature', the big red book, not the catalogue of the library.
> R: Oh yes! I have used it when I was student again using it for... when you want references on a particular subject doing essays...
> I: Can you remember an essay and a particular search that you've done?
> R: [after a pause] Human papilloma virus, that's the most recent one and the oral manifestations of it.
> I: How did you search for information on that?
> R: Using the Dental Index and also using the 'Index Medicus'.
> I: Did you search by subjects or by authors?
> R: Basically I just search by subject really, and then I used the references at the end of that to ask for articles.
> (Int.No.82/Q.39).

but they are able to carry out basic subject searches in the main section of the index.

They face three main problems: a) finding the specific subject heading; being sure that they have looked under every possible one; b) sorting out the mass of information that they may retrieve; c) getting the actual articles:

> 'The problem with that was finding the... this sort of heading [subject heading] you have to look under, that was really hard! and then also the masses that you eventually get, trying to relate which ones, which journals are actually available' (Int.No.82/Q.40.1).

Frequent use of the index makes the search easier:

> 'If you know... I think you have to... I've used it quite a lot so I know what I'm looking for, so it's fairly easy. Also in the Dental one the sections are quite small,[20] so you just look under "Orthodontics" or you look under "open bite"... and it tells you which section to go to. Very often, it was such a limited subject in the case of that one that there weren't many sections to look under [that] you were drawing a blank. And once you have found one article you would go up to the article and then you can get your references from that, so you didn't really need to search back too far'. (Int.No.70/Q.40.1)

The other alternative is an on-line search. Ten interviewees (40%) had requested at least one on-line search during the last ten years (See Table 7.14). On-line searches were always requested from a medical/dental library; unlike the manual searches in the Index to Dental Literature, they were never performed by the users themselves.

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[20]Sections are small for certain topics like Orthodontics, other specialities like Oral Pathology have very long lists of references under each subject heading and the manual search becomes very time consuming (See previous example).

Six interviewees had used the University Medical and Dental Library (HHL)[21], one of them had also duplicated the search by asking for a similar one from the British Dental Association Library. Three interviewees had used the medical libraries at general hospitals in the region and one had requested a search abroad. In all the cases the searches were limited to *Medline*, the only data base with a comprehensive coverage of Dentistry.

Sometimes on-line literature searches are preferred because they are done for them:

> *I: Have you ever used the 'Index to Dental Literature'?...*
> *R: Generally for specific topics in terms of literature search.*
> *I: Do you remember any specific search that you have done recently?*
> *R: Recently, I have to say no because I generally get the library to do the literature search for me through the Medline.*
> (Int.No.60/Q.38-39).

Literature searches carried out by library staff are a solution for end-users who do not know how to perform them manually:

> *'They* [HHL] *are quite happy to do it and I can do something else. I wouldn't be confident to do it myself because I was not trained as student how to do it'* [Whenever he needs bibliography on a topic, he requests a computer search from the HHL]. (Int.No.68/Q.38).

On the other hand some interviewees ask for an on-line search as a complement to a manual one that they have already done (Int.Nos.58;63;70/Q.39;42).

Another characteristic of these on-line literature searches is that all of them are subject searches based on key-words describing the topic; there are no examples of author searches or citation searches. None of the interviewees has downloaded a large number of references for a personal data base or saved a search for a regular up-dating. As in the case of the printed bibliographies they just know the basic possibilities and as long as they obtained some articles that give them further references, they seem satisfied. This behaviour is similar to the *sufficient approach* of the practitioners in Brember's study (Brember, 1985).

Despite the fact that hospital staff could exploit the library services better, **Using the library** is an strategy as important as **Reading** and **Talking** and like these two it is implemented on its own to solve clinical and academic information needs, as we will see in the next section.

7.3.2 Patterns of information-seeking behaviour

Hospital staff rely on simple strategies for solving most of their information needs related to clinical and academic work (See Figure 7.16).

In the case of clinical information about patients, their basic information source is the patient's file. When this source does not provide enough information, they need to seek information elsewhere. The possibilities are **Enquiring, Using the library** or **Talking** (Int.Nos.60;63;68;70;75;77;83/Q.1;39).

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[21]Replies to Q.42 were checked with HHL records of on-line searches. Both were consistent with only one exception; one interviewee gave an example that could not be found in the library files, as a consequence that reply was not included.
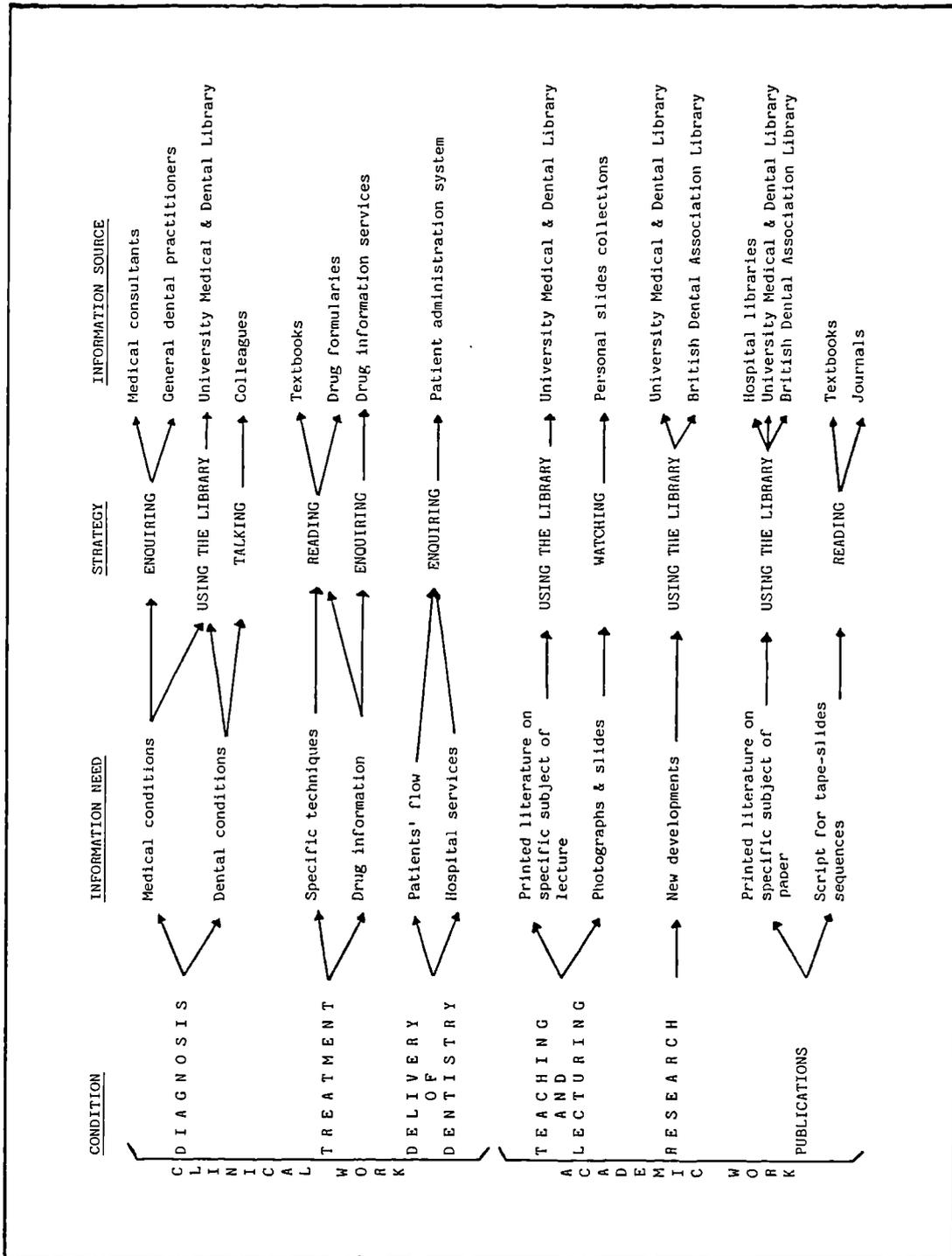
Figure 7.16: Simple patterns - Hospital staff

Enquiries are made from the medical or dental practitioner who has referred the patient to them:

> 'I often go to the library to look for journals that I need when I want to write a paper or for an oral presentation. Very rarely I need that sort of information in a clinical situation. If I need information for a patient, related to the patient, I ask the patient's doctor or specialist consultant' [He prefers to contact them over the telephone when he needs to know something fairly quickly, otherwise the communication is by letter (Q.20.3)] (Int.No.68/Q.1).

> 'A patient requiring... who's had heart surgery who I need to put an orthodontic appliance on, may need to have antibiotic cover, we need to discuss it with the surgeons at the Northern General Hospital to find out whether one that she definetely needs antibiotic cover and what they would like me to prescribe or how they want me to go about the treatment if there is any problems with the treatment...' [The enquiry was made over the telephone, and a letter was sent afterwards to be inserted in the patient's file] (Int.No.70/Q.1).

> 'I had a patient in the Department of Local Anaesthetics, who required an extraction who was taking [drug] for a medical condition, so I needed information on the patient's INR, his blood levels and so I telephoned the consultant haematologist, who was in care of the patient, so I got information on the phone on the patient's medical condition' (Int.No.75/Q.1).

the usual pattern of **Enquiring** is to obtain an immediate reply over the telephone and that conversation may be followed by a letter that is filed in the patient's clinical history.

If they need to learn about a condition they have to deal with, **Using the library** is the selected strategy:

> R: It was a patient who got an oral medicine problem, he got an ulceration in the mouth and I needed to get some information on the problem.
> I: And how did you get the information?
> R: Well, I went to... a couple of textbooks and some of the journals in the library.
> I: Anything else?
> R: No, that's all with that problem.
> (Int.No.63/Q.1)

Particular clinical conditions they want to learn about may even require a formal literature search[22].

The third alternative is **Talking** to colleagues:

> '... As far as patients are concerned, there are one or two unusual cases that I've seen recently here and one has to go and update or seek information from one of the colleagues. There is almost a continuous update

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[22]See page 152.

> *talking to colleagues about patients problems anyway. So it wouldn't seem*
> *as something that, you know,... actively going to do. It just happens all*
> *the time...'* (Int.No.60/Q.1).

Treatment situations create information needs regarding the use of specific techniques or drugs (Int.Nos.57;58;77;78;79;81/Q.1). **Reading** is a fast way of refreshing a technique that has not been used for a while:

> *R: It was a patient with a large cyst in the jaw. He will need a bone-graft.*
> *It's something we are not doing every day so I went back and looked it up*
> *in a textbook.*
> *I: Did you look for information in some other way?*
> *R: No, this was a standard textbook.*
> (Int.No.57/Q.1).

> *R: It was with regard to treating a young girl who fractured a tooth and*
> *then how to treat the tooth afterwards.*
> *I: How did you obtain the information?*
> *R: From a book.*
> (Int.No.79/Q.1)

The information source in this case is a textbook already known and this fact guarantees the success of the strategy:

> *'It told me what I wanted to know. I already knew whereabouts in the book*
> *it was, it was just a matter of refreshing myself of the exact treatment to*
> *perform'* (Int.No.79/Q.2.1).

Reading is also a possibility regarding drug information:

> *'Other information can be available, for example, taking drug histories*
> *from the formularies you can find out about drug interactions, side-effects*
> *from there...'* (Int.No.78/Q.1).

Basic information about drugs can be found in a drug formulary like the *British National Formulary* that has an extra advantage it can be carried in a pocket while they work in the clinic. If the situation requires more detailed information on a particular drug than the standard description of the formulary, **Enquiring** from a drug information service is necessary:

> [The respondent needed information urgently about a new drug. He went
> to the 'Drug information people' at the Hallamshire Hospital at lunch
> time[23]. He beat on the door until somebody came. They were able to give
> him the information by 2:30 in the afternoon. It was a very important drug
> and the information was needed to make a very serious decision related to
> a patient's care.] (Int.No.58/Q.1).

Another variation of **Enquiring** is related to the use of a patient administration system that provides both managers and consultants with activity information:

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[23]District Drug Information Service.

I: How do you get the other information, the information related to the management part of your job?

R: That is in my main unit [...] Our appointment system is computer based so all the patients that come to see me are identified on a computer PAS [Patient Administration System] and that computer counts the activity; it can separate patients that are new patients for our department and patients that I've seen before, it can count those. It can also count patients who don't attend. That information comes to me from management, from the hospital management. They examine their computer records and send me the information.

(Int.No.85/Q.1).

Information related to their clinical tasks is always needed with some urgency and therefore a simple strategy on its own is not enough unless it relies on an easily available source. The common characteristic of these simple patterns is fast access to the selected information source. Enquiries are made over the telephone or from the drug information service based at the Royal Hallamshire Hospital or from an in-house patient administration system. **Reading** depends on their own books or on a drug formulary that they carry along while they work. **Talking** refers to colleagues at the dental hospital and **Using the library** to the University Medical and Dental Library 10 minutes walk distant from their clinics.

In the case of information needs related to their academic tasks **Using the library** is the most important strategy. **Reading** is interwoven with the former and **Watching** is related only to the selection of visual aids (mainly slides) for presentation of cases and teaching dental techniques[24].

All the three instances of the academic work: *teaching, research, publications* demand up-to-date printed literature and the library offers a far more extensive collection than any personal library or even a bench collection could do. Also as we have seen, the library environment is flexible enough to allow for different ways of interaction: random search, systematic search, document search[25].

The key resource for the importance of this strategy is the University Medical and Dental Library. Hospital staff find in that library a reasonable range of journals for each dental speciality, cheap photocopying facilities and helpful staff:

'I think because of the journals that they receive it is a largely enough range for my profession. They are quite prompt with sending me the content pages, when a new journal arrives, so I can at least know what is happening even if I might not have all the time to go and read it' (Int.No.60/Q.33.2).

'All the journals that I would want are there apart from one. The staff is very helpful. There are two photocopiers and it is fairly cheap to use it and the literature searches you don't have to pay for them' (Int.No.68/Q.33.2).

'There is a good selection of material. The staff are very helpful. The premises are reasonably convenient. Also they have good liasion with other libraries to obtain materials from other libraries which aren't in this one' (Int.No.65/Q.33.2)

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[24]See **Watching** page 144.

[25]See page 153.

The proximity of the University Medical and Dental Library to the site of work and the quality of its services are the two factors that make the strategy as important as Reading and Talking. The same applies to the hospital libraries in the region:

'The library is absolute first class' (Int.No.59/Q.33.2)

'For what I use it I am satisfied. I don't use it extensively for lots... for a range of things, I mean. I know what's going to be there, so I tend to just go and do one particular thing. They've usually got the book, they've usually got the journal and I usually get access to it, because there are few other people in my speciality here so [it's] easy for me to do' (Int.No.84/Q.33.2).

The fact that the British Dental Association Library is less used despite being a unique special dental library is linked to the distance; although it accepts telephone and written requests this procedure is inevitably time consuming (Int.No.63/Q.9).

The simple patterns indicate a trend that it will be confirmed by the combined and complex patterns: **Reading** and **Using the library** are essential strategies for hospital staff.

The combined patterns show pairs of strategies in which one strategy complements the other one. Each strategy aims at a different information source, for example clinical history-radiographs; colleague-journals and provides different types of information, for example written notes on the patients' condition-visual displays; advice on patient's management-updating on new developments, that are combined to satisfy the same information need (See Figure 7.17).

In the case of conditions defined by their clinical work the combined patterns revolve around **Reading** (Int.Nos.66;78;82;83;85/Q.1):

'I need of course information about patients. I use, my particular speciality [Orthodontics] relies very much on storing information about patients, clinical conditions and referring back to that information. So I clinically store information in the form of study models, in the form of radiographs, in the form of clinical notes ...' (Int.No.85/Q.1).

R: Very often you may require advice, working in a hospital you always have people who are more qualified, the consultants are available, you can just go and have a chat with them, they will provide with information. [...] I suppose just general reading for every journal club.
I: In any other way do you obtain information?
R:... Say that it's just form reading journals, chatting with people.
(Int.No.78/Q.1).

R: Very often I need information related to the medical condition of my patients.
I: How do you obtain this information?
R: Normally by contacting whoever had been treating them or by getting their notes [patient's file] from another hospital.
(Int.No.66/Q.1)

Clinical information about patients is recorded mainly in written form but radiographs, study models and impressions are other ways of storing data, and as a

consequence, **Reading** is logically complemented by **Watching**. If the clinical information is related to the medical condition rather than to the dental clinical history of the patient, **Reading** is complemented by **Enquiring**. Finally if the information is needed for dealing with particular cases **Talking** to other members of the staff provides expert advice and **Reading** dental journals keeps them up-to-date.

In the case of conditions defined by their academic work the combined patterns revolved around **Using the library** (Int.Nos.57;59;63;70;74/Q.68-70).

The literature review that is required at the beginning of a research project demands a formal bibliographic search that can only be done at the library. The usual pattern is combining self-made manual searches in the *Index to Dental Literature* or the *Index Medicus* with on-line searches requested from a library service:

> [The respondent was reading for a Master of Dental Surgery by research only. A manual search was carried out in the "Index Medicus" and then an on-line search in Medline was requested from the University Medical and Dental Library for establishing what the baseline research was in the field of his project (Q.39;42). The actual research required contacts with other departments in the university in order to use facilities and equipment that were not available at the dental hospital (Q.68)] (Int.No.63).

> [The respondent was reading for a master of dental surgery by research only. She started her project with an on-line search requested from two different libraries, the University Medical and Dental Library and the British Dental Association Library. Then she complemented that search with manual searches in the "Index to Dental Literature" (Q.42). The actual research required the collection of clinical information about school children, and she chose a sample from Sheffield's school population. The data collection demanded contacts with schools to arrange the visits (Q.68)] (Int.No.70).

In both cases **Using the library** is complemented by **Enquiring**, whilst the first strategy provides background information about the state of research on a particular topic, the second one provides the more practical information that is necessary to carry out the actual project.

The examinations for the Fellowship in Dental Surgery demand a comprehensive knowledge of basic medical sciences (anatomy, physiology, pathology) for the primary examination and of any aspect of Dentistry for the final one. All the information that the candidates need comes in the form of printed literature:

> *'The information you need it is all basic sciences with some clinical applications ... You obtain it from textbooks mainly. You can also find latest papers on various topics from the journals ... Most of this information is fairly well established and it is not that much of new developments. Really you can usually get all you need from textbooks. There's just a few exceptions where there is still research going on where you need to find out the latests publications and that'* [The respondent is preparing the primary examinations for the FDS and obtains the information from her own collection or from the HHL] (Int.No.74/Q.68-70, see also Q.26).
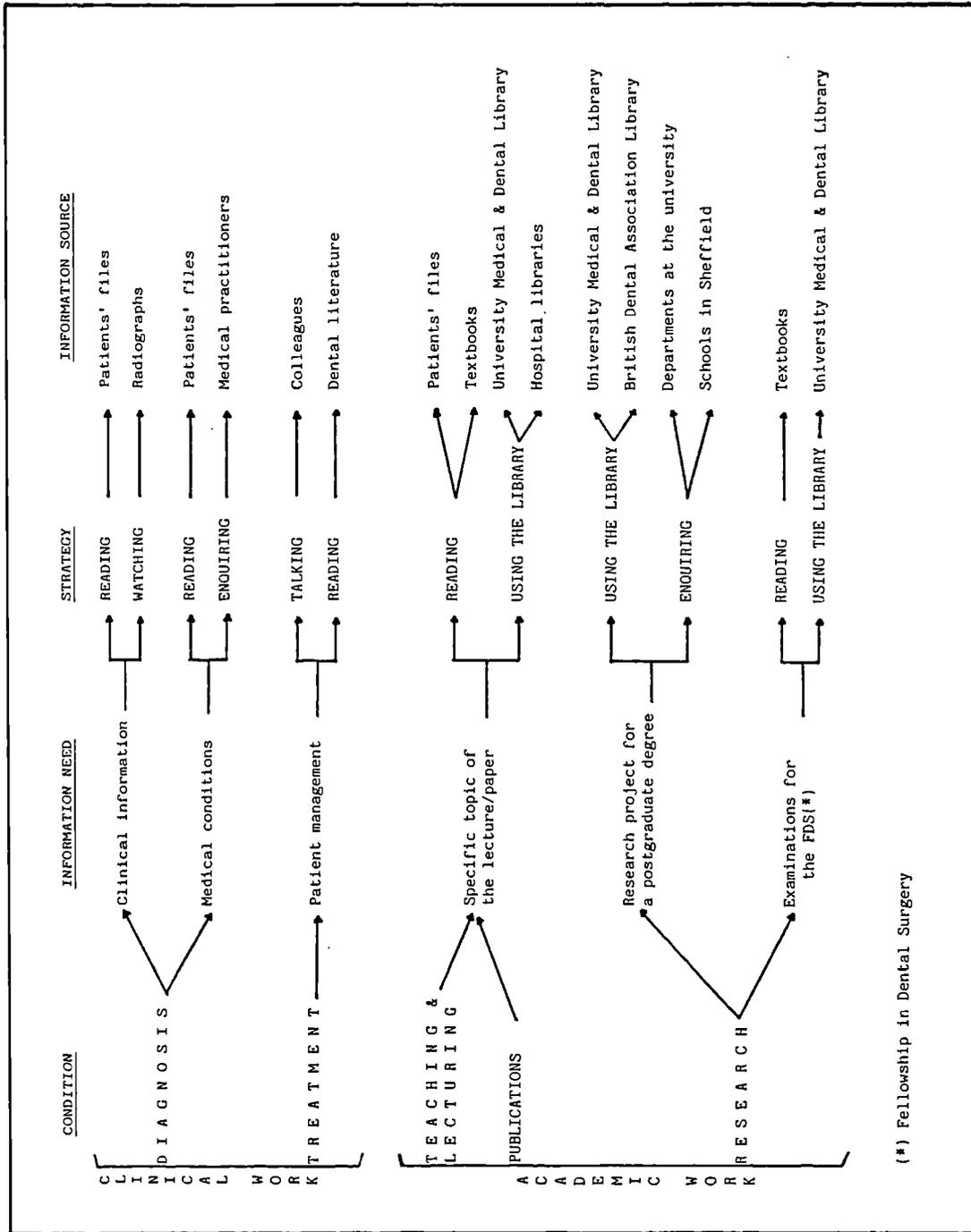
Figure 7.17: Combined patterns - Hospital staff

The simplest way of seeking information for these examinations is combining Reading of their own materials with **Using the library** to find out those that they do not possess. A similar combination occurs in the case of seeking information for a paper or a lecture:

> [When the respondent prepares a lecture or a paper he needs information that is available from a standard text. He finds that information in his own collection of textbooks and notes or from the library] (Int.No.57/Q.75-76)

The trend revealed in the simple patterns of information-seeking behaviour persists here as well: **Reading** and **Using the library** are the axial strategies of that behaviour.

Complex strategies are likely to be implemented for any condition related to clinical or academic work (See Figure 7.18). In the first case, clinical work, complex patterns are an orderly progression from one strategy to another until all relevant information is gathered (Int.Nos.72;73/Q.1):

> *'I have a patient with a malignant condition in the neck, which I have discussed with certain colleagues in surgical, pathology and radiotherapy. Further to discussions I've made reference to published textbooks, recent papers and a further distribution for opinion on national and international basis, regarding the diagnosis and the protocol for the treatment...'*
> (Int.No.73/Q.1)

or on the contrary the overall information-seeking behaviour unfolds randomly as the situations arise (Int.Nos.64;65/Q.1):

> [The respondent needs information to justify her point of view on treatment planning in Orthodontics] *'It is usually through group discussion in which you take people's words for it and their sources and occasionally... mostly by chance you would come across in the literature something that you had been discussing so the next time you discuss something we can use this to justify our point of view from the previous time. We don't actually think "ah! I need to justify something now I will go and look it up" because very often you don't have time to do that. You have it at the back of your mind, the last controversy or the last thing that you heard in a lecture and then you keep your ears open.'* (Int.No.64/Q.1)

The two less mentioned strategies: **Attending/organizing CE events** and **Watching** appear in these patterns. The former has already been mentioned in the example above as a mean of keeping up-to-date. It is mentioned again in the context of the examinations for the Fellowship in Dental Surgery:

> [The respondent is preparing for the Fellowship in Dental Surgery final examinations by private study that he described as:] *'just reading, reading journals and textbooks; getting clinical experience, one-to-one teaching or group teaching from members of the staff* [dental hospital] *and I would like to go on a taught course at some stage.'* [He uses his own journals and textbooks and those of the library, he discusses with senior colleagues at work and he plans to complement all that attending the special courses organized by the Royal Colleges of Surgeons] (Int.No.75/Q.26;68-69).
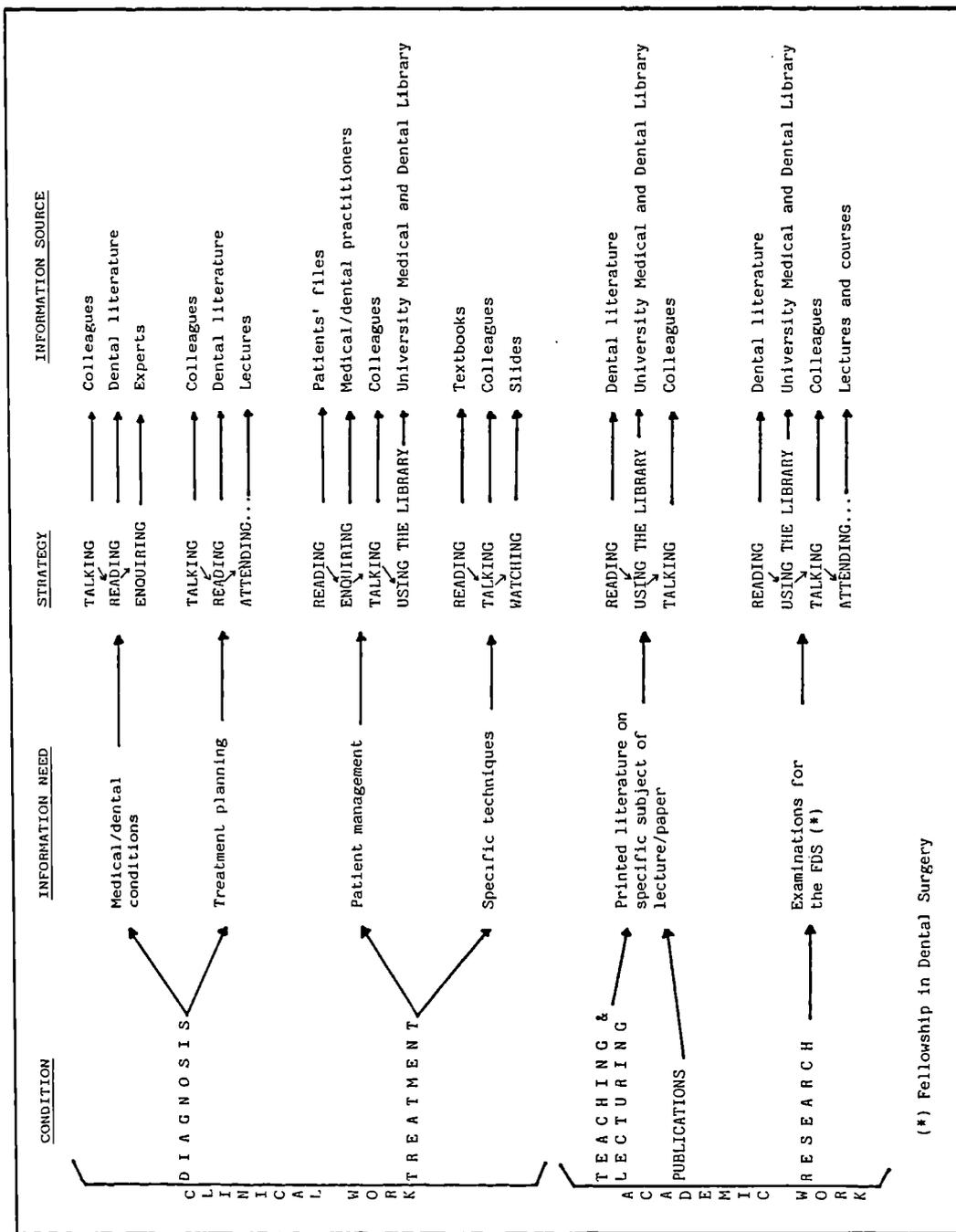
Figure 7.18: Complex patterns - Hospital staff

As I have already pointed out **Attending...** is a long term strategy for hospital staff, others as in the above examples, produce more immediate results[26].

Watching appears as a strategy to complete information available in printed form:

> *R: I was asked to remove a patient's submandibular gland three months ago so I went back and read the anatomy the surgical anatomy of the site [...] then I went to the theatre and did the operation.*
>
> *I: How did you look for information? You told me that you read about it.*
>
> *R: Well just according to the books and read.*
>
> *I: It was textbooks or journals?*
>
> *R: Textbooks.*
>
> *I: Did you look for information in any other way?*
>
> *R: Yes I asked the consultant, he went through the operation with me beforehand.*
>
> *I: So you discussed the procedures with the consultant.*
>
> *R: Yes and also he had some surgical anatomy slides, he was very keen on the surgical anatomy, so he gave me to look at myself. I looked at them and supplemented the anatomical facts with that. I found them very useful. So I suppose I do it in three ways.*
>
> (Int.No.72/Q.1).

such a pattern is consistent with the value hospital dentists have attached to Watching[27], but even so visual aids are not used on their own while written-printed literature is.

Again the patterns followed for seeking information in the context of teaching and writing are the same:

> *R: Maybe a postgraduate lecture or a paper which requires checking on references and trying to find out information. Over the years you tend to accumulate knowledge and from time to time I need to go back and just make absolutely certain what I think I know really it's true.*
>
> *I: How do you look for the references, how do you check?*
>
> *R: The references would normally be in my own field, and therefore I would go through the journals and any other publications in that field and check through those or if it was something outside my field, I would go to the library and ask them to do a literature search on a particular subject. Or question colleagues always a good source.*
>
> (Int.No.62/Q.1)

Complex patterns as well as simple and combined ones are centered on **Reading** and **Using the library.** The essential information sources are patients' files and dental literature, hence the importance of these two strategies in the overall information-seeking behaviour of hospital staff.

Talking is a strategy systematically used in day-to-day work; there are well defined patterns of interaction: joint clinics, presentation of cases, journal clubs and committee meetings. However, **Reading** and **Using the library** are the strategies behind the scene, because whatever their points of view might be, hospital dentists need to justify them on clinical or literature grounds.

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[26]See page 144.

[27]See **Watching** page 144.

Finally hospital staff –with very few exceptions– has found it very difficult to describe management information needs and the respective strategies. On the one hand management information has recently become as important as clinical and scientific information; on the other hand it is expressed in different ways from clinical notes and scientific articles and therefore **Reading** and **Using the library** cannot be relevant strategies.

Chapter 8

The Use of Information by Community Service Dentists

8.1 The community service dentists

I interviewed the 15 dentists that were working for the Community Services of Sheffield Health Authority at August 1st 1989. All of those approached agreed to take part in the study and as a result they were the only group with 100% response rate.

They qualified between 1960 and 1987; they represented a range of professional age from 30 years to two years in practice (See Table 8.1). Almost half of them (46.7%) were graduates from Sheffield University and the rest came from five different universities in the United Kingdom with only one dentist graduated abroad (See Table 8.2). Eight of them had already obtained some postgraduate qualifications or were reading for one (See Figure 8.1). A third of the staff (5) was reading for a postgraduate degree (MSc's in Anaesthesia, Restorative Dentistry, Community Dental Health) or preparing for the Fellowship in Dental Surgery examinations at the time of the interview (See Table 8.3).

In August 1989, the Community Dental Service had five senior dental officers and 10 community dental officers (See Table 8.4) covering the central clinic in Sheffield City centre and 16 dental clinics spread throughout the town. The staff was almost evenly divided between full-time and part-time (See Table 8.5). Regardless of their position and whether they were full-time or part-time, they worked in one or two different clinics and two senior dental officers were based at the central clinic and visited others for joint sessions with the permanent community dental officer (See Table 8.7). Their pattern of work had a further complication: five of them took weekly sessions at the Charles Clifford Dental Hospital and two worked in independent practice (See Table 8.6).

While at the central clinic there were three dentists working together at any time with their respective dental surgery assistants, and the help of a dental hygienist, a dental therapist and a receptionist; dentists in the other clinics worked usually on their own with a dental surgery assistant who was the receptionist as well and a visiting dental hygienist. However, this isolation was partially overcome because they could arrange joint sessions with a senior dental officer; they could also visit a colleague at the central clinic and finally some of them worked part-time at the dental hospital or a general dental practice.

No postgraduate qualifications

47% (7)

53% (8)

Some postgraduate qualifications
(It includes current studies)

(Data from Q.50 and 51)
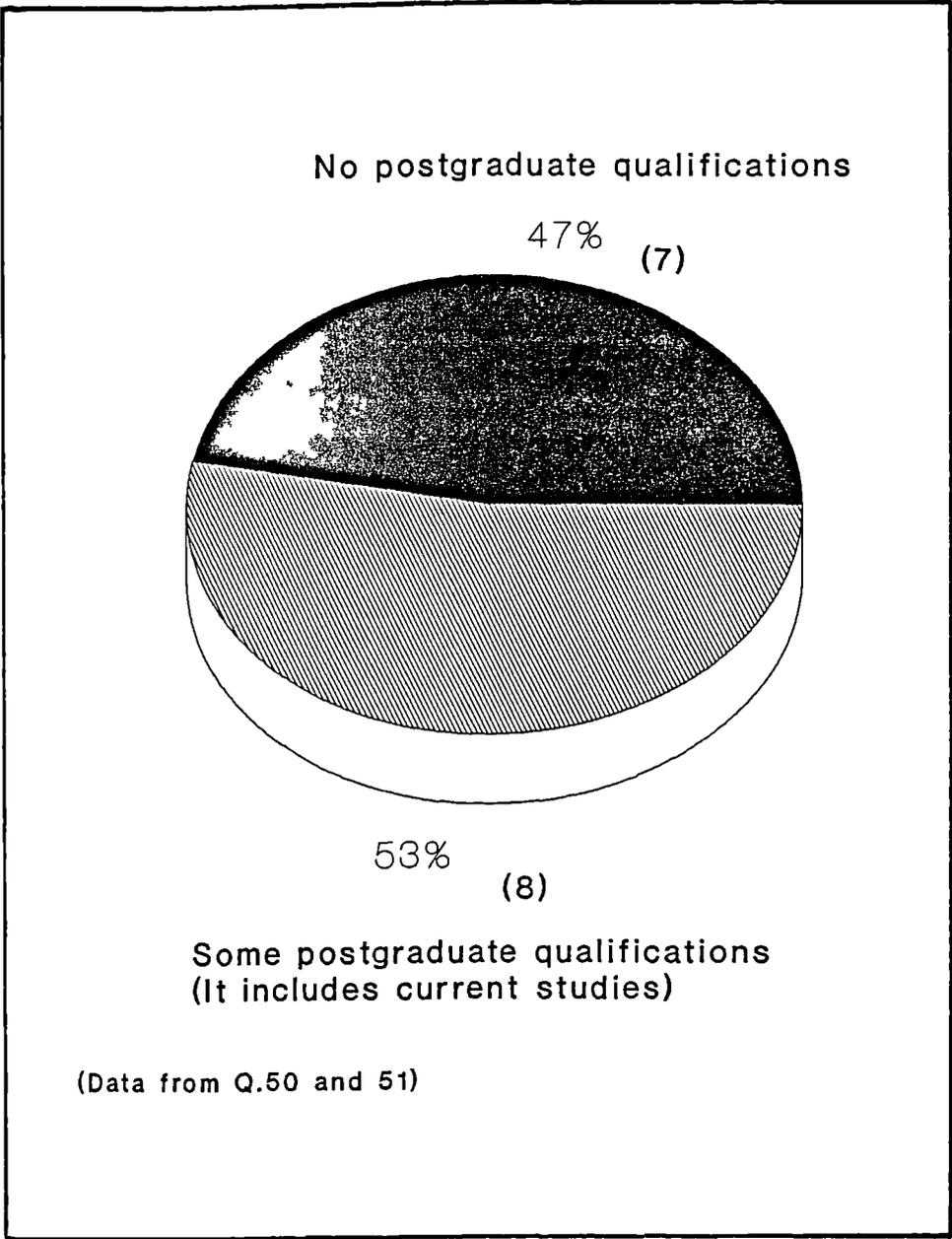
Figure 8.1: Postgraduate training of community service dentists

Table 8.1: Interviewees by year of graduation

Year[a]	Graduates	%
1960	1	6.7
1962	1	6.7
1964	1	6.7
1966	1	6.7
1969	1	6.7
1970	1	6.7
1971	1	6.7
1979	2	13.3
1980	1	6.7
1982	1	6.7
1983	1	6.7
1985	1	6.7
1986	1	6.7
1987	1	6.7
TOTAL	15	100.0

[a]Data from Q.48.

The report of the Sheffield Health Authority Community Services Unit (1989) described the Community Dental Services in these terms:

'The Community Dental Service provides a range of dental screening, preventive health education and treatment services for pre-school and school age children, expectant and nursing mothers and handicapped adults, (including those who are housebound or resident in nursing homes).

In addition the Community Dental Health Unit provides a range of specialist dental public health screening, including dental health promotion, epidemiology, teaching and research on behalf of District Health Authority and University Dental School' (op.cit. p.13).

This scope of the Community Dental Service[1] was consistent with the specialities practiced by its staff: Children's Dentistry predominated, followed by Orthodontics and Gerodontology (See Table 8.8). They were also interested in Epidemiology applied to Dental Health.

The links between the Community Dental Service and the University Dental School were at clinical, teaching and research level. Five community service dentists worked once a week at the dental hospital. Their job was clinically orientated (i.e. treating patients), but two of them also had teaching responsabilities in the Child Dental Health Department of the Dental School and were involved in research projects.

Finally there was one aspect of the profession in which this group was not active: publishing papers and audiovisual materials. Only three of them had published or

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[1]There is no possibility of private treatment under the Community Dental Service.

Table 8.2: **Undergraduate training by dental school**

University[a]	Graduates	%
Sheffield	7	46.7
Leeds	1	6.7
Liverpool	1	6.7
Bristol	3	20.0
London	1	6.7
Birmingham	1	6.7
Abroad	1	6.7
TOTAL	15	100.0

[a]Data from Q.49.

Table 8.3: **Postgraduate training**

Level of training[a]	YES		NO	
	%	()[b]	%	()
Professional qualifications[c]	26.7	(4)	73.3	(11)
Postgraduate degrees	13.3	(2)	86.7	(13)
Current postgraduate studies	33.3	(5)	66.7	(10)

[a]Data from Q.50 and 51.
[b]Values in () indicate frequencies.
[c]Membership and Fellowship of the Royal Colleges of Surgeons.

Table 8.4: **Status in the Community Dental Service**

Status[a]	Interviewees	%
Senior Dental Officer	5	33.3
Community Dental Officer	10	66.7
TOTAL	15	100.0

[a]Data from Q.56.

Table 8.5: **Full-time/Part-time jobs**

Dedication[a]	Interviewees	%
Full-time	7	46.7
Part-time	8	53.3
TOTAL	15	100.0

[a]Data from Q.53.

Table 8.6: **Places of work**

Place of work[a]	Interviewees	%
Community Dental Service (CDS) only	8	53.5
CDS and weekly session at dental hospital	5	33.5
CDS and independent practice	2	13.0
TOTAL	15	100.0

[a]Data from Q.52.

Table 8.7: **Places of work within the Community Dental Service (CDS)**

Dental clinics[a]	Interviewees	%
One	8[b]	53.5
Two	5	33.5
Central Clinic and visits to others	2	13.0
TOTAL	15	100.0

[a]Data from Q.52.
[b]One of these interviewees spent most of the time doing domiciliary visits to elderly patients.

Table 8.8: **Practice by speciality**

Speciality[a]	Interviewees	%
Children's Dentistry	12	80.0
Orthodontics	2	13.3
Gerodontology	1	6.7
TOTAL	15	100.0

[a]Data from Q.59.

were preparing papers for publication. None of them had been involved with the production of audiovisual materials or computer software for Dentistry.

A previous user study had merged the general dental practitioners with community service dentists (Walker, 1976) assuming that both groups had similar styles of work and, as a consequence, similar information needs. But in the present study the community service dentists turned out to be a small group full of contrasts. Those who worked alone in clinics far away from the central one, were working in similar conditions to those of the general dental practitioners in solo practices. The main difference was that the former worked mainly with children. On the other hand those who were working in the central clinic or part-time at the dental hospital had a pattern of tasks resembling those of the hospital staff: routine cases mixed with serious conditions, teaching and research involvement although clinical commitments were the most important ones. That contrast is in fact like the differences between junior and senior hospital staff. The resemblance between community service dentists and hospital staff is confirmed by the scope of their information needs as we shall see in the next section.

8.2 The conditions for their information needs

The work of community service dentists comprises a mixture of clinical and academic tasks with the emphasis on the former because clinical tasks are either their only commitment or the most important one.

Regarding their academic tasks the community service dentists have described similar situations to those of hospital staff. They may need information to prepare tutorials or lectures, to carry out research or postgraduate studies or to prepare a paper (See Figure 8.2 and 7.2). In all these cases the required information is in the form of printed literature and as we shall see in the next section, their information-seeking strategies rely on **Reading** and **Using the library**[2].

Regarding clinical tasks the conditions for their information needs are again basically the same as those of hospital staff, but with characteristics of their own because community service dentists work only with certain groups of the population: children, handicapped people, elderly people and they are involved in dental public health screening (See Figure 8.2).

The clinical tasks of community service dentists are: i) dealing with routine cases, mainly children; ii) treating patients with special needs; and iii) planning and implementing dental screenings. Each of them requires different types of information. Routine cases demand clinical as well as social and family information about patients for making the diagnosis and deciding a course of treatment (Int.Nos.43;47;48;50;52/Q.1-3):

> 'I suppose the diagnosis, once you've made the diagnosis you tend to pursue the treatment plan as far as you can go. The diagnosis is when you are looking whether the patient can come, whether they can do what you want, whether they want it to do it' (Int.No.43/Q.3.).

> 'The first thing that comes to my mind... I've been treating patients this morning, it is the fitness of the patient for dental treatment, if they are

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[2]See **Reading** page 181, **Using the library** page 202 and **Patterns** page 212.

fit and healthy. So when a patient comes the first thing you have to do it is to get information regarding their... if they are suitable for dental treatment. Information about consented treatment... that the parents know what people are going to do... they understand what I'm going to do' (Int.No.47/Q.1).

At the same time, community service dentists treat patients with special needs (Int.Nos.44;45;46;51;53/Q.1-5):

'... we look after all the special needs, children with special needs, so in fact most of the children that are seen by us either here or at the other clinics have got something not usual about them. Either it's a special problem from the point of view of delivering the dentistry, so they might be handicapped or they may have a special medical problem that makes the Dentistry a risk to them so they might have a heart problem...' (Int.No.45/Q.1).

Patients with special needs regarding the delivery of dental services are handicapped patients, elderly patients and patients suffering from serious or rare medical conditions. *'Serious'* medical conditions are those that make the delivery of dentistry a risk for the patient, for example a patient who needs an extraction and is suffering from a heart condition (Int.No.53/Q.1). *'Rare'* medical or dental conditions are those never seen before by the dentist or those not frequently encountered in every day practice, for example a patient suffering from *Swchawman Diamond Syndrome* a rare syndrome the dentist has never come across before (Int.No.51/Q.1). In this case, community service dentists need a detailed medical history of the patient, as well as learning about the particular condition from which the patient is suffering.

At treatment level, assessment of particular cases or specific dental techniques are the situations likely to require information as well:

'Maybe just a second opinion on a child that we are treating, something like that. That's most often' (Int.No.49/Q.1).

'Looking at a technique for a re-implanted tooth' (Int.No.50/Q.1).

The provision of community dental services demands more practical information, for example how to divide the working time between screening and treating patients:

'From an organization point of view I need information... organizing my time between going into schools and doing screenings, school screenings and then dividing my time at work' (Int.No.42/Q.3).

They need to liaise with school staff to plan screening programmes (Int.No.47/Q.3); apart from the epidemiological data that they collect during the screening itself, they need information from school records (Int.No.42/Q.3) and finally they need information about the actual design of the survey (Int.No.45/Q.1).

Community service dentists have identified four areas where information may be difficult to obtain: patient's reason for calling, medical conditions of patients requiring dental treatment, printed literature and management information.

The initial dialogue between patient and dentist is the standard procedure used to find out why the patient has come; it usually succeeds:
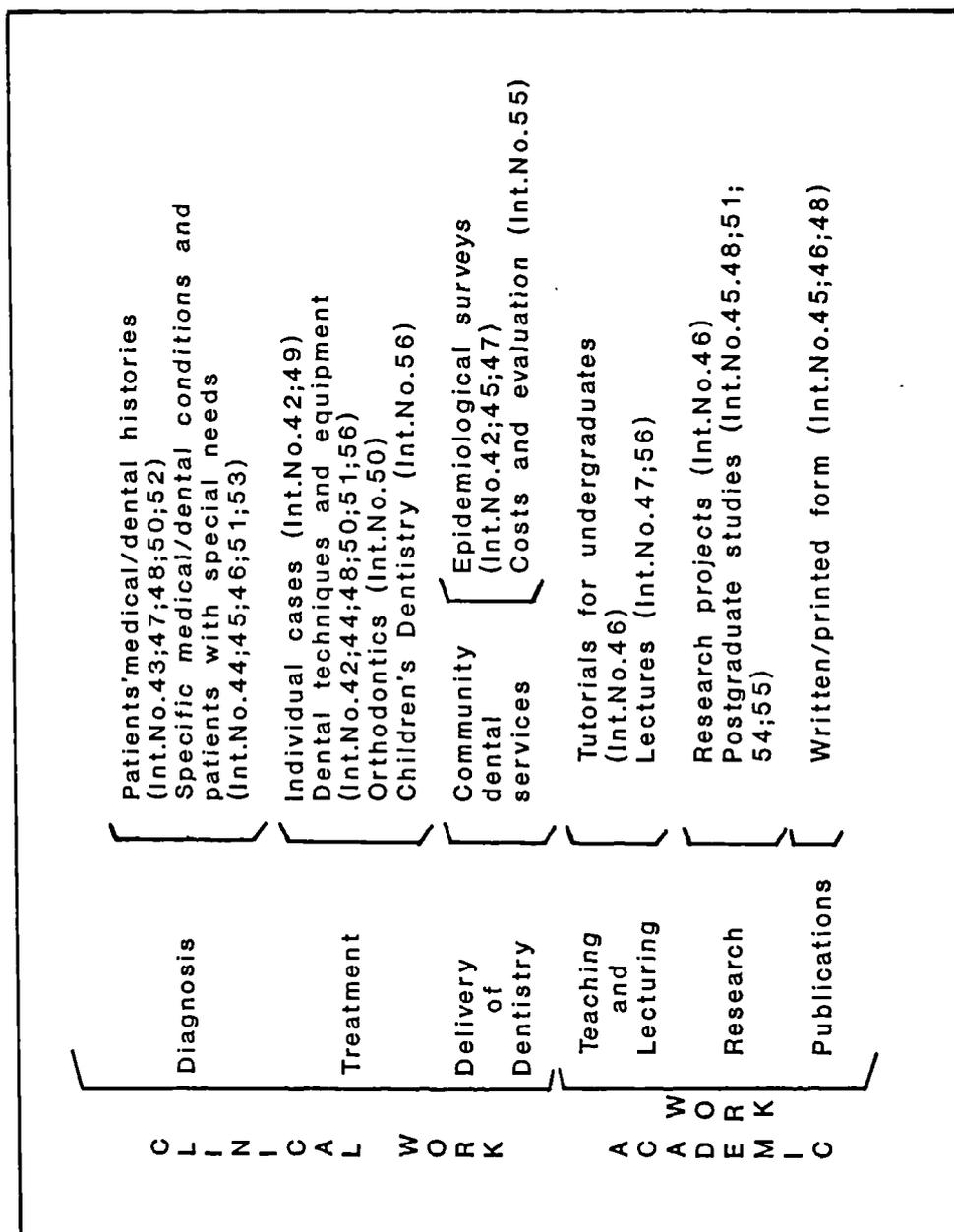
Figure 8.2: Conditions for information needs of community service dentists

'If you ask direct questions, you get direct answers, but those that I find most difficult to ask are those involving family relationships: foster families, which parents are living with how much they see... [the child] I find this intrusive and I don't like doing it' (Int.No.43/Q.5).

but because they treat children mainly, they find that family background information is quite necessary and not always easy to obtain:

'Information regarding the social backgrounds of patients, specially when you get patients with difficult social problems: broken homes for example. Very often it helps me if I've got a child who is frightened or scared ... or difficult to treat... I often think that social problems are contributing to that and it is in fact difficult to get information perhaps in a diplomatic way why the child is behaving like this' (Int.No.47/Q.5).

Another problem at this stage is related to the patient's ability to express himself/herself (Int.Nos.50;52/Q.5):

'I would call it difficult sometimes it's getting the patient to describe exactly what the trouble is. Very often they say one thing but they mean another, the words they use may mean one thing to them and a different thing to me... I have to make sure that we speak the same language' (Int.No.52/Q.5).

The dental management of medically compromised people is another area where information is not always easy to find. Firstly it is not a dental speciality strictly speaking like Orthodontics or Oral Pathology, but it requires specialist knowledge in Medicine and Psychology to deal with the patients, as one interviewee said: *'... it isn't something that you can describe and quantify, like how to prepare a tooth'* (Int.No.46/Q.5). Secondly as a result of being in a recently developed field dentists feel that their training is not adequate:

'... I deal a lot with the elderly and I find great difficulty deciding on treatment plans when they are medically compromised ... because we don't have an awful lot of training in that kind of situation' (Int.No.53/Q.3-4).

Finally even experienced staff find it difficult to discover in the printed literature, specific information about rare medical conditions:

R: To be honest sometimes the most difficult sort of information to find is in fact information related to specific clinical conditions. Because that involves often a lot of heavy library work to find out what you want. If you are doing some research yourself you'll know. There is a lot of rubbish you have to read before you find what you are really looking for [...]. The things that we come across, the majority of things that we come across we are fairly familiar with even though they might be unusual. So when we come across something we are not familiar with it, it is usually quite unusual.
I: So it's unusual for everybody.
R: Yes, it's often quite difficult to find something specific to help you.
(Int.No.45/Q.5).

Access to printed literature may be difficult either because it is not available in the library, for example foreign journals not taken by the library (Int.No.54/Q.5) or because it is difficult to fit a visit to the library within the pattern of work at the community dental service:

> R: Probably when you have to make the effort to start to go and look in the library, not because it's difficult, it's difficult to remember to do it when you are working here [a clinic of the community dental service]. It's difficult to remember when you are at the University to go to the library and ... let's go and do that. Not because it's difficult to get hold of the ... [The respondent stops without being able to continue].
> I: Do you mean because of the distances?
> R: Yes the distances, now the medical library is a bus ride away...
> I: It's difficult to plan, is this what you are trying to tell me?
> R: Yes. In my case because I do two days a week here [community dental service clinic] I am doing an MSc at the dental hospital one day a week. So it's difficult to try to remember doing different things from different jobs on different days.
> (Int.No.48/Q.5).

Management information appears again as a difficult area:

> 'So as a senior dental officer I need more information about what other dentists are doing as well as what I am doing myself. I would like more information on the costs of doing things; we've got very little information about that... This is one of the things that's coming in. They've called it resources management allocation. That kind of studies is being carried out at six hospitals at the moment. This is not for Dentistry... but it's bound to come to us' (Int.No.55/Q.3-4).

> 'I suppose the most difficult information to find is that which concerns the basic organization of the Community Dental Service. Things which concern administrators, which generally, actually I just take over without it's concerning me. But on the occasions when you actually need to know how your time is organized, how decisions are made which are over your head it's quite difficult to communicate with senior staff, we don't have many staff meetings' (Int.No.42/Q.5).

Radical changes for the NHS planned by the government and the lack of approppriate communication channels within the service are the root of this problem.

Community service dentists have a complex pattern of work in terms of patients, places of work and tasks. They treat patients, a mixture of routine and specialist cases, children, handicapped and elderly people; they visit schools for dental screenings; they may work at different clinics, have sessions at the dental hospital and be engaged in postgraduate studies. They need a variety of clinical, technical and management information, very similar to that required by hospital staff. However there is an important difference between these two groups. Hospital staff perform their tasks in a single environment: the dental hospital close to the dental school and the university library. Seeing patients, teaching, journals clubs, meetings, everything happens in the

same place. Instead community service dentists do different jobs in different places on different days of the week. This fragmentation is reflected in the way each strategy is implemented and how these strategies are combined.

8.3 The information-seeking behaviour of community service dentists

8.3.1 Basic strategies

Reading

The pattern of **Reading** is essentially the same as the one I described in the previous chapter for hospital staff (See Figure 8.3 and 7.3). Community service dentists apply this strategy to find out clinical information about patients, to check or to learn techniques they need to apply, and to follow the political issues of the profession. They also use it to obtain information required for teaching, preparing a paper or their postgraduate studies.

Reading the patient's file is one possible way to find out or to start finding out information about patients:

> '*It is fairly clear and detailed. It is a comprehensive piece of information any other dentist can use*' (Int.No.47/Q.11).

but community service dentists are more likely to prefer **Enquiring** from the patients or the parents or **Talking** to another colleague[3].

On the other hand **Reading** is the preferred strategy for keeping up-to-date with new dental techniques, dental politics and postgraduate studies. So in fact **Reading** is mainly associated with printed literature.

Community service dentists –all of them– read dental journals and magazines regularly; some of them (53.3%) consult textbooks for reference purposes and a few of them (26.7%) have mentioned manufacturers' literature (See Table 8.9). They read the journals and magazines that are included in the membership of professional associations, for example *British Dental Journal* and free-mailed magazines, for example *Dental Practice*. The majority of them (86.7%) borrow journals and books from the University Medical and Dental Library (HHL), the community dental service headquarters or less frequently from another colleague. Again as in the case of the hospital staff, **Reading** and **Using the library** are closely related. Despite the fact that subscription to dental journals comes in fourth place after membership, free-mail and borrowing, 60% of the community service dentists pay personal subscriptions not related to the membership of an association. It is the highest percentage of personal subscriptions for the whole study. Personal purchases of textbooks is, as usual, very low; only 26.7% of the interviewees buys personal books (See Table 8.10).

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[3]See **Enquiring** page 192 and **Talking** page 188.
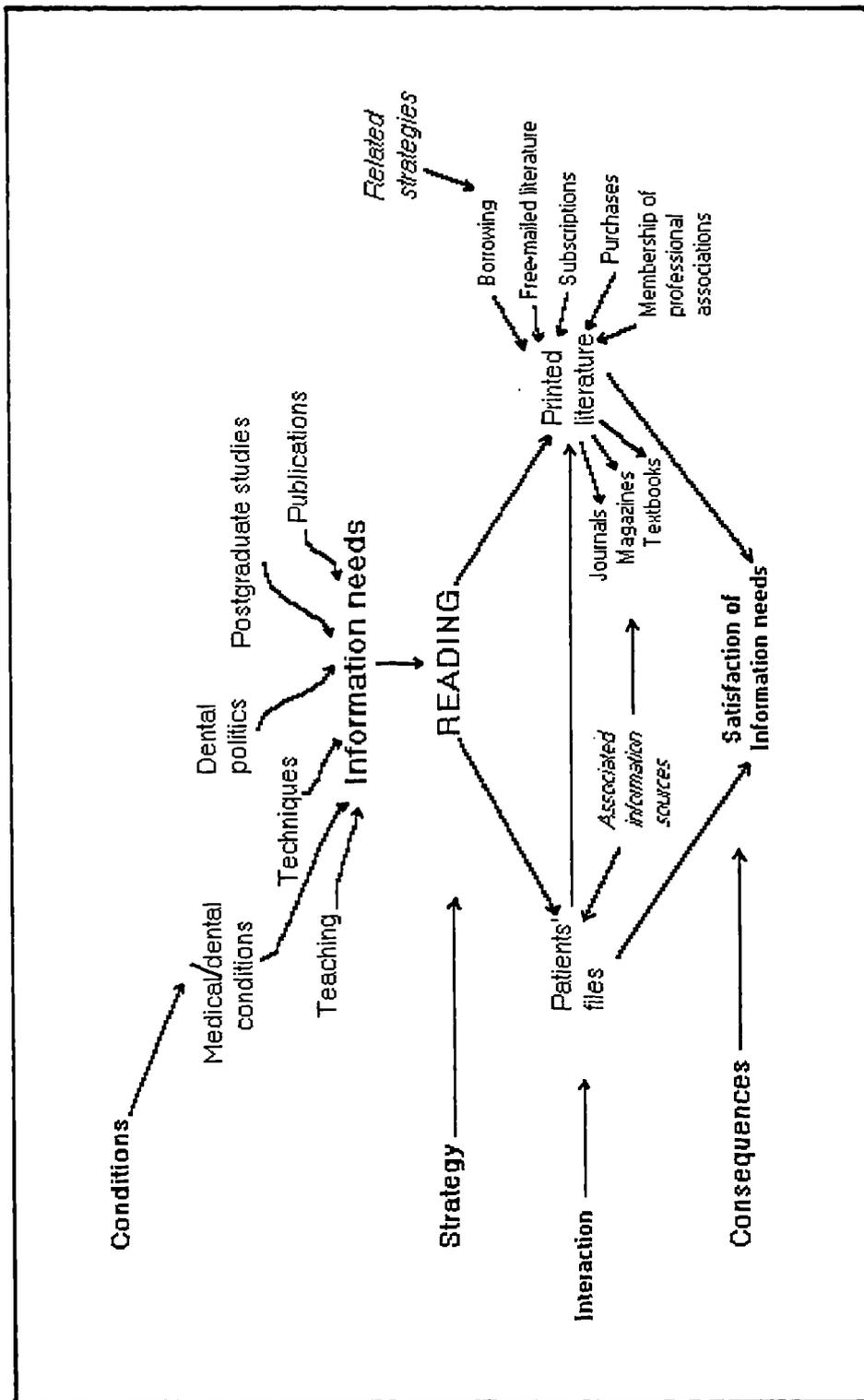
Figure 8.3: Reading as a basic strategy for community service dentists

Table 8.9: **Reading by type of document**

Type of document[a]	CSDs	
	%	()[b]
Journals	100.0	(15)
Magazines	100.0	(15)
Textbooks	53.3	(8)
Other	26.7	(4)

[a]Data from Q.14;22 and 23.
[b]Values in () indicate frequencies.

Table 8.10: **Origin of the literature**

Origin[a]	CSDs	
	%	()[b]
Membership	100.0	(15)
Free mailed	93.3	(14)
Borrowing	86.7	(13)
Subscription	60.0	(9)
Purchase	26.7	(4)

[a]Data from Q.14 and 26.
[b]Values in () indicate frequencies.

Most journals and magazines read on regular a basis are general dental ones (See Table 8.11). Three journals: *British Dental Journal, Dental Update* and *Journal of Paediatric Dentistry* are their main sources for **Reading**:

> *'Because they are really the only journals* ["British Dental Journal"; "Journal of Paediatric Dentistry"] *I read on regular basis. My only contact with current thinking. I have to say that I read them very... I don't read them from cover to cover, I am very selective about what I read'* (Int.No.42/Q.14.3) [The interviewee adds later on that she reads only occasionally other dental literature] *'Only if I'm after a specific thing, yes. If there is a specific topic for instance I might talk to a colleague he might pass me a paper... or whatever. So very occasionally yes, but as a general rule, regularly no. It's the same with textbooks I mean, I've got some textbooks... that I don't read on regular basis'* (Int.No.42/Q.23).

> *'One because it keeps you up-to-date... with what it's happening with Dentistry in the U.K., particularly with any new developments and also any new research that is relevant to my speciality. It also helps you to keep in touch with professional discussions and arguments that are going on in the profession because there are reports of meetings and also there are*

letter columns, which are very entertaining, which give you ... where matters of nitty-gritty professional interest can be thrashed out sometimes to a great length with great numbers of letters going backwards and forwards' [The respondent refers to the "British Dental Journal" and the "Journal of Paediatric Dentistry"] (Int.No.45/Q.14.3).

'It keeps me up to date really. I find out what people are doing ... just to keep in touch with the dental profession' [The respondent refers to the "British Dental Journal"] (Int.No.47/Q.14.3).

'I think it's important to find out what's going on. I always look at the jobs sections even when I have no intention of finding jobs. The letters are interesting, it helps to know what other people from other parts of the country think about current questions' [The respondent refers to the "British Dental Journal"] (Int.No.53/Q.14.3).

These journals cover the main aspects of their practice: General Dentistry and Children's Dentistry. Specialist journals cover the fields of Orthodontics, Anaesthesia and Dentistry for the handicapped, the specialities of just a few community service dentists. In both cases, general and specialist dental journals provide them with information about developments at scientific and professional level. They read them to keep up-to-date with advances in Dentistry but also to keep in contact with the rest of the profession (Int.Nos.42-56/Q.14.3).

Some community service dentists have identified **Reading** as a preferred initial strategy (Int.Nos.44;46;50;52;54/Q.10-11):

R: Journals I've got at home [...] because it is easy.
I: It is easy in which sense?
R: I know what I've got there. So it is not terribly well organized but [it's] *a good start. It is quick. I know whether I've got something or not in ten minutes, whereas ten minutes in the library wouldn't tell so much* [The respondent points out that she knows her own material while she cannot control the library collection in the same way. She seems to find the library system difficult.]
(Int.No.44/Q.10-11).

'Because I can use it [own books and journals] *in comfort at home when I want. It is easy'* (Int.No.46/Q.11).

Reading may be selected as an initial strategy because it refers to their own collections to which they have direct access whenever they want. Almost all the community service dentists (14) have a personal collection of books and journals at home (See Table 8.12). Some of them keep the journals for some time and eventually they throw them away (Int.Nos.47;53;54;55/Q.29.1):

R: If it is relevant, I take certain articles out, but generally we keep the journals for up to 6 months and then we throw them.
I: How do you organize these materials?
R: Do you really want to know? In a pile in the study. We've only just moved out so we are not really that organized.
(Int.No.53/Q.29).

Table 8.11: **Journals and magazines read by community service dentists**

Journals and Magazines[a]	CSDs	
	%	()[b]
American Journal of Orthodontics...	6.7	(1)
Anaesthesia	6.7	(1)
BDA News	13.3	(2)
British Dental Journal	93.3	(14)
British Journal of Anaesthesia	6.7	(1)
British Journal of Orthodontics ·	13.3	(2)
British Medical Journal	6.7	(1)
British Society of Dentistry for the Handicapped [Annual report]	20.0	(3)
Community Dental Health	6.7	(1)
Dental Advertiser	6.7	(1)
Dental Practice	53.3	(8)
Dental Update	73.3	(11)
The Dentist	13.3	(2)
European Journal of Orthodontics	6.7	(1)
The General Dental Practitioner	6.7	(1)
Journal of Paediatric Dentistry	60.0	(9)
Journal of the R. Society of Medicine	6.7	(1)
Newsletter R. College of Dentists of Canada	6.7	(1)
The Probe	40.0	(6)

[a]Data from Q.14;22 and 23.
[b]Values in () indicate frequencies.

Table 8.12: **Collections of dental literature**

Type of collection[a]	YES		NO	
	%	()[b]	%	()
Personal collections	93.3	(14)	6.7	(1)
Library at work	46.7	(7)	53.3	(8)

[a]Data from Q.29 and 30.
[b]Values in () indicate frequencies.

In other cases collections seem to remain for longer periods but there is no attempt to impose any order on them (Int.Nos.43;47;48;49;56/Q.29.1):

> *'I keep the journals but I throw away the junk... In a very untidy pile amongst the sewing and everything else. I disorganize it to be honest'* (Int.No.43/Q.29.1).

The highest level of organization described is to file the journals in date order and the cuttings and photocopies under subject subdivisions of their own, without any other indexing (Int.Nos.44;46;51;52/Q.29.1):

> [The respondent has his own collection of books. In the case of journals he cuts out the articles he is interested in and files them in a filing cabinet by subject subdivisions of his own. He has a personal collection of slides for his teaching and for his research work.] (Int.No.46/Q.29.1).

Only one interviewee keeps a manual index in the form of a personal diary:

> *R: Well ... I have several different ways depending on what the piece of information is. If it is related to a dental topic ... then I have a filing cabinet at home which has basically an A/Z file in it, and then all clinical topics are filed ... all relevant bits and pieces are filed in that. That is if I'm actually duplicating the information of some of the periodicals I get I cut them up and then put them into this file. Now there are a few exceptions to this. The two exceptions are the two paid journals that I receive, the "British Dental Journal" and the "Journal of Paediatric Dentistry". Both of those I just keep those journals sequentially, I don't cut them up. Now as well as that I also have a separate file ... it's a separate one for and related to administrative work, related to job... and I just file in different topics.*
> *I: Do you have any kind of index by title or by author to find out the material or you just look under subjects?*
> *R: I just look under the subject. Yes I don't have a sort of cross indexing system. Actually that's not quite true. Actually the other thing that I have* [He walks across the room and picks a notebook from his briefcase] *is this book as well. I think it is a sort of indexing system, which has all sorts of different topics in it. So as well as having my file system at home I carry this around with me. This is alphabetical by subject* [He shows me the notebook, under each topic he lists whatever he has collected and if he comes across with any new item, he adds it to the end] *This is my brain.* (Int.No.45/Q.29.1).

Except for this case, community service dentists rely on their memory to retrieve any information from their personal collections:

> *'I just keep the journals.* [The respondent keeps also a few photocopies]. *They are not indexed in anyway. I just rely on knowing where things are when I want them'* (Int.No.42/Q.29.1).

Access to reference collections at work depends on which clinic the community service dentists are based; this is the reason why only seven have replied affirmatively (See Table 8.12).

The central clinic has a small library:

R: We collect the Dental Magazine, which comes to us free there as well
... apart from that the Probe comes as well, that's free. The rest of the
collection is in fact textbooks. They are just ... we have certain textbooks
... which are actually in all our community dental clinics. Do you actually
want to know what textbooks they are?
I: No, just the subject.
R: They are clinical textbooks, textbooks on Clinical Dentistry. There are
a few established reference books that all the clinics have.
I: How is it organized?
R: Just on the bookshelf. It's just a bookshelf, that's all. It's not a massive
library.
I: Who uses it?
R: Probably only me [he laughs] but they are there for all clinicians and
auxiliary staff to read it if they want to. I would imagine that they are just
occasionally referred to by clinicians, that's who actually uses them.
(Int.No.45/Q.30).

This description of the bench collection is basically consistent with the replies of
other dentists who work at the central clinic (Int.Nos.42;43;44;46/Q.30.1). They have
also mentioned that the collection includes current drug formularies (Int.Nos.42;46/Q.
30.1) and journals such as *American Journal of Dentistry for Children* and *Gerodontics*
but the subscriptions seem to have stopped two or three years ago (Int.No.44/
Q.30.1). The collection is focused more on Children's Dentistry than on Orthodontics
(Int.No.43/Q.30) and in practical terms is only of use to the five dentists who work
at the central clinic.

Despite the statement of one interviewee (See Int.No.45/Q.30 above), none of the
other clinics had bench collections. One interviewee said she could use the library at
the health centre where her clinic was, but that library kept only medical videos and
journals; so she had her own textbooks in the clinic (Int.No.51/Q.30.1).

The Community Dental Services headquarters has a collection of 12 titles covering
Geriatric Dentistry and Community Dentistry, and a small collection of books on
Public Health, Management and Research methodology. This collection is open to
any member of the staff but the headquarters are rather remote from most of the
health centres[4]; because of that the collection is underused (Int.No.55/Q.30).

At the time of the interviews the current journals of that collection were circulated
among the senior dental officers along with other documents on management and gov-
ernment policies. However, some senior dental officers did not mention that and those
who did it made just a general reference without any details. The interviewee who did
describe that collection was the only one following a postgraduate degree in Public
Dental Health and that collection suited her speciality. As for the rest they were
clinically orientated, even at senior level. Their specialities were Orthodontics, Chil-
dren's Dentistry, handicapped patients, elderly patients, and their reading interests
were clearly in these areas.

Reading is the key strategy of community service dentists for keeping up-to-date.
It is associated almost exclusively with printed literature and more specifically with
general dental journals. It is used for other conditions as well, for example clinical

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[4]The Community Dental Services Headquarters are based at Nether Edge Hospital and no clinic
is close to them.

information or postgraduate studies[5]. As an initial strategy, it is preferred when it refers to personal collections at home rather than at work. Personal collections at home are always accessible, they may not be organized but they are constantly updated, while collections at the place of work may be in a clinic away from the one they have to attend, or may not cover their particular interests.

Talking

This strategy is implemented by community service dentists to seek information related to patients' treatment, new developments and both the planning and the day to day running of the community dental services (See Figure 8.4).

Community service dentists discuss all sorts of cases with other colleagues at work either because they are difficult or interesting ones:

> 'When I have problems with the treatment because I am not sure about the treatment. When it is an unusual case that might interest other people' (Int.No.55/Q.17.1).

They seek information in the form of advice or a second opinion from a colleague when they need to decide complicated treatment plans, for example orthodontic treatment plans, or to manage difficult patients, for example a non-cooperative child:

> 'I discuss management of patients, difficult patients, management of particular problems, for instance gross caries, orthodontic problems, use of materials' (Int.Not.42/Q.17.1)

> 'When a course of treatment is not progressing very well, if I've got problems of any sort, if it is a difficult case, a patient with a difficult clinical history, a handicapped patient, something like that I would discuss it with a senior colleague' (Int.No.47/Q.17.1).

Talking as a strategy for seeking patient related information has informal and formal patterns of interaction. Those dentists working at the central clinic, where there are three dentists at any time including specialist senior dental officers, have described informal conversations or meetings:

> 'I just go to a surgery where a particular colleague is working and when he's got a moment I ask him, you know, I take notes, x-rays whatever is relevant with me, and if he's got a moment I would have a chat about it' (Int.No.42/Q.17.3).

> 'Informal, anywhere, I grab them on the stairs. I wouldn't do such things like phoning them at home' (Int.No.46/Q.17.3).

Informal conversations are less feasible for those dentists working alone in a clinic, unless they speak on the telephone with another community dental officer, but the amount of information they can find in this way is very limited. Therefore they rely on joint clinics with senior dental officers:

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[5]See **Patterns** page 212.
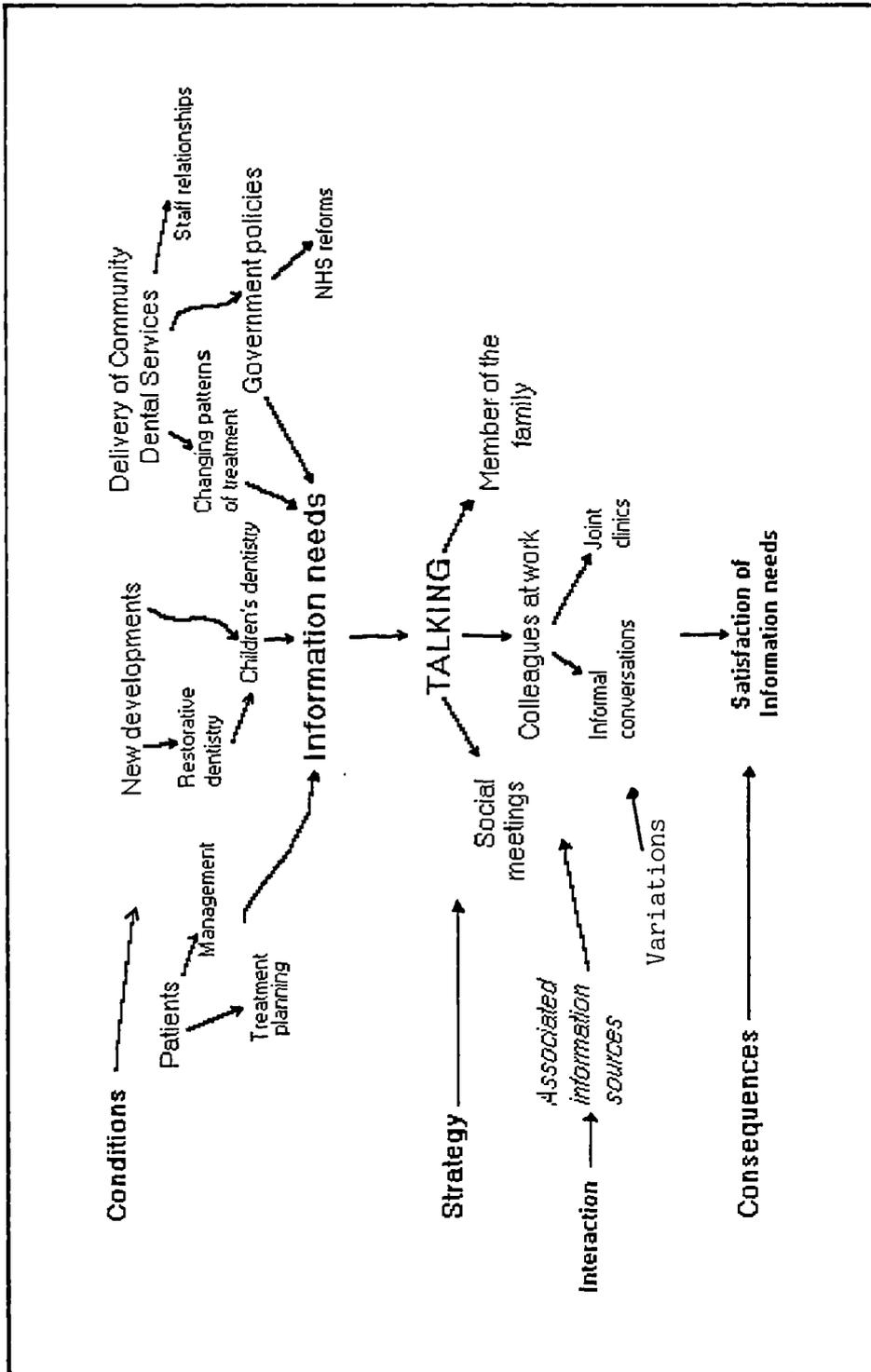
Figure 8.4: Talking as a basic strategy for community service dentists

'A lot of joint sessions, they [the orthodontists] *come to our clinic to see groups of patients and we discuss treatment planning and then either we treat them in the clinic if it is simple or they may go to central clinic or the dental hospital if it is complicated'* (Int.No.49/Q.17.3).

Community services dentists have regular joint clinics with orthodontist specialists to decide and monitor treatment plans that are usually for long term treatments. They can also arrange visits of the children's dentistry specialist to advise them about any difficult case.

Talking is also used to find information about new developments in the specialities relevant to their work mainly Restorative Dentistry applied to children's treatment. Orthodontics is a less dynamic speciality as one interviewee described it[6] and discussions tend to be focused on particular cases rather than actual changes. The patterns of interactions are always informal. They talk about new developments at a break during work, at social events after a lecture or a course, or at home when another member of the family is also a dentist. Community service dentists – unlike hospital staff– do not have formal instances of this strategy, for example journal clubs, within their overall tasks to review new developments relevant to their practice (Int.No.42-56/Q.18).

Talking is a successful strategy for seeking patient related information and keeping up-to-date, but this same strategy has a less successful role for exchanging information relevant to the organization and management of community dental services. This fact is related to a particular situation of the service at the time of the interviews.

The interviews took place in August/September 1989, just after the publication of the White Paper[7] and the controversy provoked by the New Contract for general dental practitioners[8]. The basic data sets for activity information had already been defined by the 7th Körner report in 1987[9]. There were impending changes in the community dental services as a result of the general reform of the health system. Community service dentists discussed issues such as the future of the service in the context of the White Paper, changing patterns of treatment from school children to elderly and handicapped people; but these discussions were only on an informal basis with a pattern similar to that used to discuss new developments:

> R: *Informal meetings so they often are cut short by the arrival of the patients, or maybe at lunch time.*
> I: *So you don't have staff meeetings where you discuss this sort of things?*
> R: *At the moment we only seem to have staff meetings once a year.*
> (Int.No.44/Q.19.3).

While community service dentists can seek information for keeping up-to-date by means of other strategies, for example **Reading** and **Using the library**, as they actually do, they do not have alternative strategies for management information.

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[6]Totally new techniques have not appeared since the late seventies when the straight wire technique was developed (Int.No.43/Q.18).

[7]WORKING for patients (1989).

[8]See page 73.

[9]The work of hospital and community dental services had not been examined by the Steering Group on Health Services Information; because of that the Dental Services Statistics Group was set up and produced a special report for dental services in the NHS (Dental Services Statistics Group, 1987).

Community service dentists have identified management of services as an area where information is difficult to obtain[10] and the lack of staff meetings seem to be related to that. All the interviewees declared that staff meetings were infrequent (Int.Nos.42-56/Q.19). The replies indicated that there used to be more frequent staff meetings in the past but there had not been one for at least a year. The first staff meeting after a long period took place in September 1989 while I was still interviewing them. All community service dentists agreed that staff meetings were infrequent and that should not be so. But their replies were short and they felt relunctant to expand upon that issue. The fact that the District Dental Officer had sent a circular asking them to accept my interview did give me a 100% response rate but it did not help me to find much information about this particuar problem. In brief Talking is a key strategy for helping the flow of management information but without formal patterns of interaction the staff is left without suitable alternatives.

Talking is perceived as an easy and immediate means of obtaining information therefore it is selected as an initial strategy, particularly to seek clinical information:

> 'If it is something I need to know about it, I would ask another dentists initially to see if they have heard about it.
>
> Yes, I think I would always ask somebody more senior what they thought of a particular item, then I would probably try to find some references about it in one of the journals.
>
> Because I think they are more reliable than advertising. They actually have hands on usually on whatever I was asking about, the experience of using it. (Int.No.48/Q.9-11).

> 'Because somebody who has already had a similar case or done a similar treatment can give you the real experience. In journals you get ideal situations that are not always the same in real practice. Also because it means immediate information you don't need to go away nor search for it' (Int.No.51/Q.11).

Colleagues as a source of information have several advantages over printed literature and hence the advantages of Talking over Reading and Using the library:

> 'Because it's ... first of all access is good, it's easy; there is usually somebody about on the days I work. I work two days a week. On the days I work there is usually somebody there either an orthodontist or a paedodontist who I can talk to. It is easy to get information ... oh we are talking about clinical information, from somebody that is currently using the information ... who can actually anecdotally tell me what I need to know. I find it very much easier to talk to somebody who can answer questions as well ... I find it very much easier to discuss something to get information than just read something' (Int.No.42/Q.11).

> 'It all depends on what the information is. If it is actually about ... if it's a clinical matter I would usually either go directly to a colleague or directly to a reference book that I have at home. It's usually the first way that I start. If it is about a technical or managerial matter related to the provision of the

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[10]See page 180.

service, the community dental service or whatever then I would probably go to either [another member of staff or a superior] *for advice. [...] Again colleagues, I think that, if you approach a colleague about something, if they know about it they can usually impart that information in five minutes to you, the same information that would have taken three hours in the library to find. So it is always worth trying colleagues. And it maybe that that colleague will know some references directly or indirectly to certain texts or whatever to read.* [Regarding managerial information, colleagues are considered:] *Really because that is my ... only, it is not the only available way of information, but again it is the quickest and most direct way of finding an answer to any question ... and usually it is a satisfactory answer'* (Int.No.45/Q.9-10).

'Because they are reasonably easy to get hold of them ... and the ... as I say, the people that I might speak to, tend to be also working sessions at the Dental Hospital, so I presume they have got up-to-date information, practical information! not just very academic information. Some articles in the "British Dental Journal" can be very academic and not always terribly practical. Do you understand what I mean?' (Int.No.49./Q.11).

Talking unlike **Reading** and **Using the library** allows an active exchange between user and source. This exchange is unique and purpose built to elucidate a particular problem. Colleagues can answer specific questions, provide practical insight and save time, all at once and this is very important for clinicians who are always pressed by time.

Talking is successfully implemented for seeking patient related information; it is partially used for keeping up-to-date but **Reading** and to certain extent **Using the library** have a more important role. **Talking** does not succeed in providing basic management information because of internal situations within the service.

Enquiring

Community service dentists implement this strategy for seeking information in two situations only: patients' management and dental screenings of school populations (See Figure 8.5 and 8.6).

Enquiring from the patient and the parents in the case of children is the initial strategy to obtain a description of the medical and dental condition and to ascertain the patient's reason for calling. This initial dialogue can provide enough information to enable the dentist to diagnose and decide a course of treatment. But further information may be necessary, then **Enquiring** is implemented again to seek information from other professionals involved with the patient's care. Community service dentists approach: i) medical doctors (general practitioners, hospital consultants, paediatricians) to verify details of clinical histories if the patient is medically compromised; ii) social workers and health visitors when there is reason to believe that family situations are an obstacle to the child's treatment or when a patient fails to attend treatment sessions and cannot be reached; iii) speech therapists to refer patients with speech problems, specially in the context of orthodontic treatment; iv) a variety of health professionals (physiotherapists, occupational therapists, etc.) involved with the treatment and care of handicapped and elderly people (See Figure 8.5).
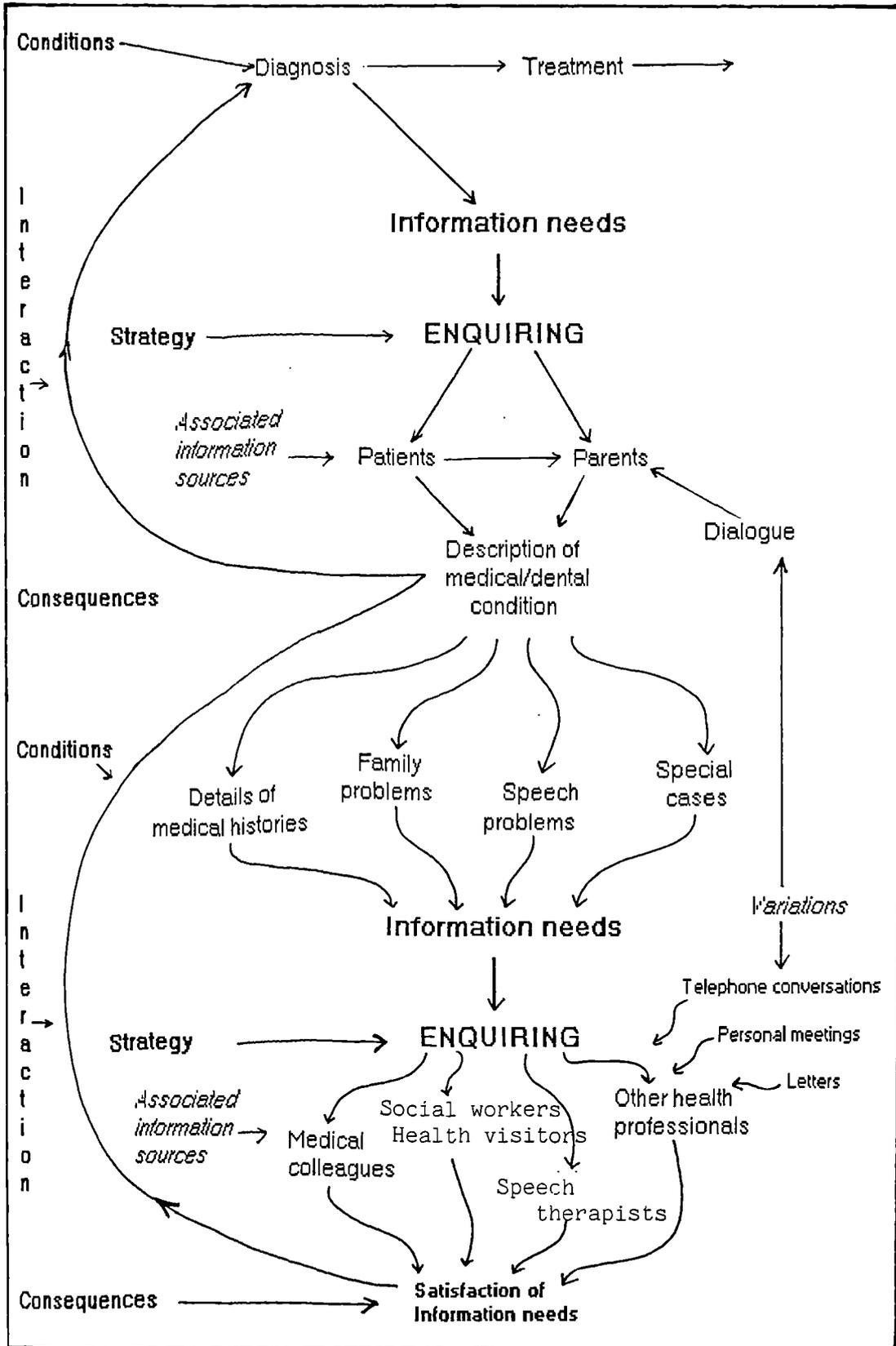
Figure 8.5: Enquiring as a basic strategy to seek patients' information - Community service dentists
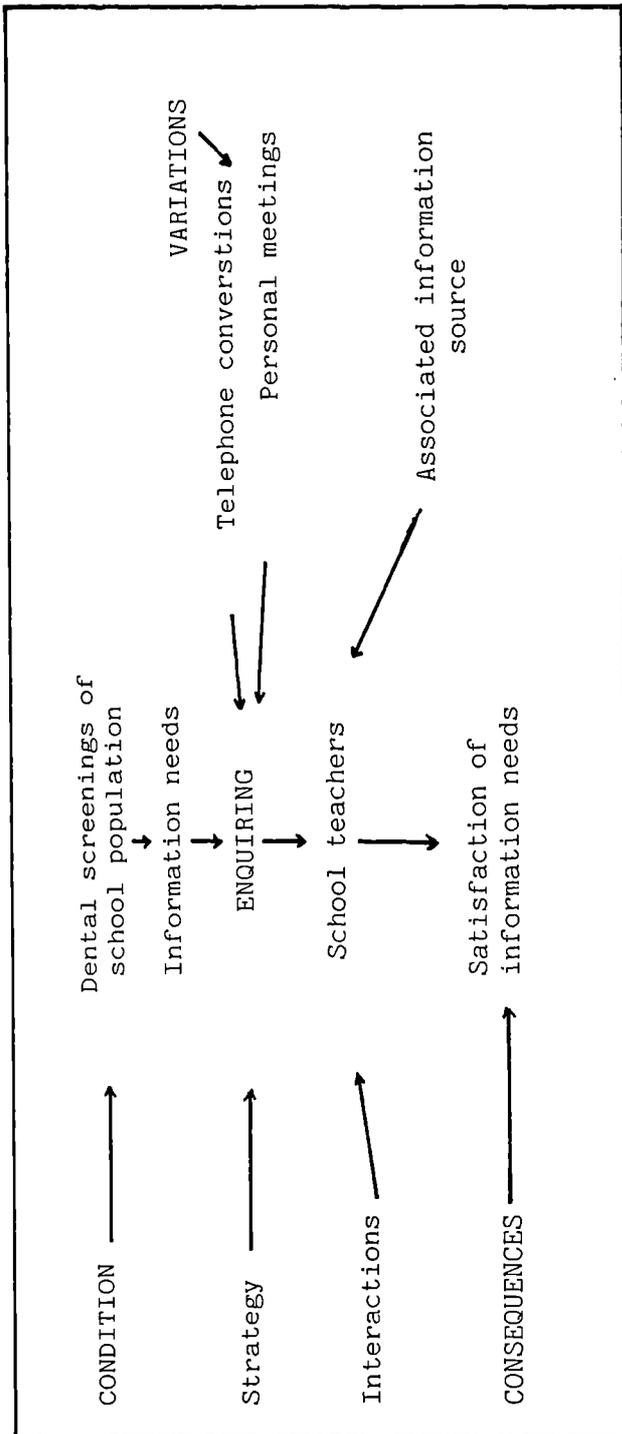
Figure 8.6: Enquiring as a basic strategy to seek management information
- Community service dentists

Community service dentists usually need the information straightaway so enquiries are made over the telephone:

> '*I would ring his surgery and ask whether I can have a word with the doctor about one of his patients*' (Int.No.52/Q.20.3).

letters are a second resource when personal contacts are not possible:

> '*By telephone mainly, or by letter in the case you cannot get hold on the phone*' (Int.No.48/Q.20.3)

and finally personal meetings are preferred when the other professional works at the same clinic, for example speech therapists based at the central clinic (Int.No.44/20.3).

The three variations of **Enquiring**: telephone conversation, letter, personal meeting are used alone or combined according with the extent and urgency with which the information is required:

> '*It varies, sometimes it's by letter, sometimes it's by phone and then following on from that we may see the person involved*' [another professional] (Int.No.45/Q.20.3).

Dental screenings of the school population require data about school children and their timetable availability in order to actually carry out the screenings. Community service dentists seek that information from teachers and other school staff in person or over the telephone (See Figure 8.6). This is the only other instance when this strategy is used by them. Some interviewees mentioned contacts with lawyers and accountants but that was in relationship with their job in private practice, not because of their work in the community dental service (Int.Nos.48;50/Q.20). This fact reveals that community service dentists are not actively involved with practice management as general dental practitioners and hospital staff are. Also it is consistent with the problems that community service dentists have described regarding management aspects of their job[11] and the lack of formal communication channels within the service[12].

The associated information source for **Enquiring** is always individuals from other professions and occupations. Community service dentists contact organizations very rarely (See Figure 8.7). They make very little use of information services in the medical/dental field (See Figure 8.8). The Local Health Authority and the District Drug Information Centre are the only services ever used, but community service dentists have never mentioned them in the context of any situation. The only data is that 33.3% of the interviewees have contacted the Local Health Authority and 20% the District Drug Information Centre at least once.

Enquiring in the case of community service dentists is a preferred strategy at the diagnostic stage to gather data about the patient and at later stages to carry on with treatment; apart from that and the organization of dental screenings they do not seem to implement this strategy in any other situation.

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[11]See page 180.
[12]See Talking page 190.
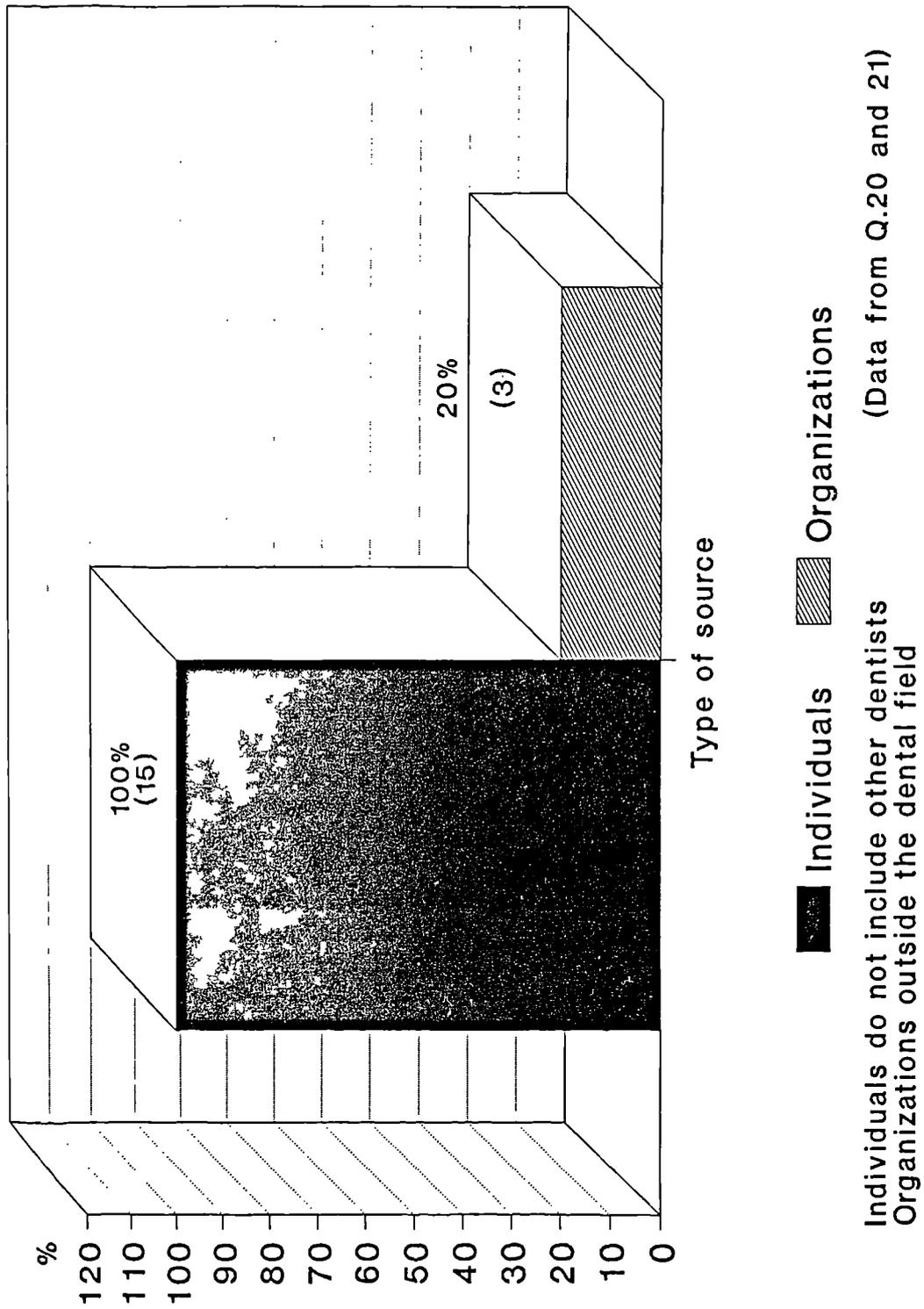
Figure 8.7: Information sources for Enquiring - Community service dentists

(Data from Q.36)

YES [ ] NO

FDI: Federation Dentaire Internationale
LHA: Local Health Authority
DDIC: District Drug Information Centre
RDIC: Regional Drug Information Centre
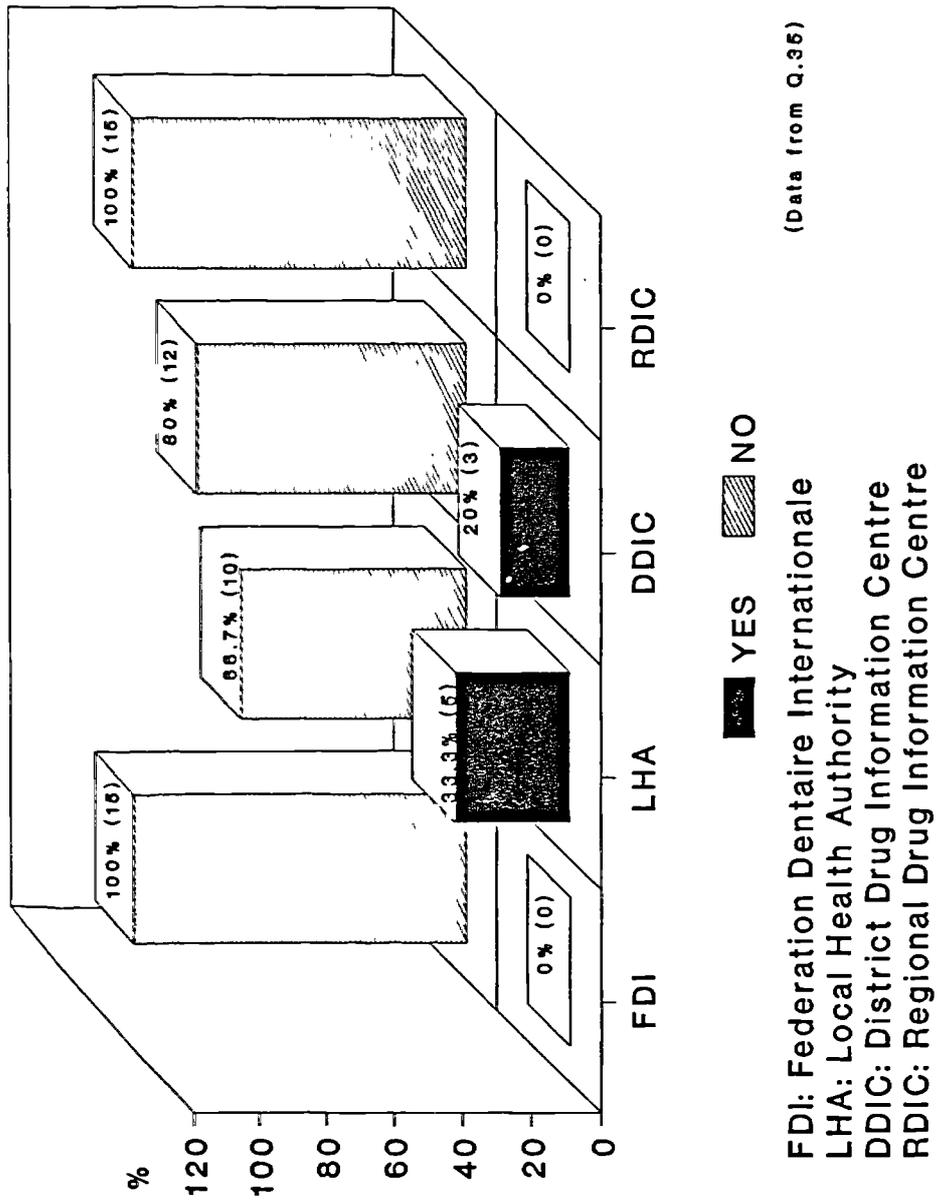
Figure 8.8: **Use of information services by community service dentists**

Attending/organizing continuing education events

Community service dentists only attend continuing education events such as post-graduate courses, conferences and lectures; they are not actively involved with their organization. Those of them who are teaching at the dental school work mostly with undergraduate dental students. They apply **Attending...** to deal with three conditions: learning new techniques, keeping up-to-date and preparing for the Fellowship in Dental Surgery examinations (See Figure 8.9).

The majority of them attends both courses and conferences frequently. They prefer to attend courses in Sheffield or the Trent Region, but most of those who attend conferences do so anywhere in the United Kingdom (See Table 8.13 and Table 8.14).

The replies indicate other characteristics of this strategy when it is implemented by community service dentists. They attend courses and conferences on any subject related to their job, which means anything related to the treatment of children, elderly and handicapped people and dental epidemiology (Int.Nos.42-56/Q.15.3;16.3):

> *'Whatever I feel that I need to know more about, whichever there has been current developments in; whichever I feel I don't know... for instance there are new guidelines on X-rays, so I went to an X-ray course and I think I would probably go on one of these cast porcelain crowns and porcelain veneers'* (Int.No.48/Q.15.3).

This wide scope of subject interests is in conflict with their actual duties at the Community Dental Service because study leave has been suspended unless it is an in-service training course:

> [The respondent only attends local meetings because:] *'It is possibly cost, I suppose... getting leave to attend these things. We have applied and been turned down, there is not a great encouragement to attend conferences or courses... They do tend to organize their own, which tend to be less expensive'* (Int.No.47/Q.16.4).

Several factors compensate for the consequences of this suspension. There are post-graduate courses at the local dental hospital/school that can be attended outside working time, for example on a Saturday. There are also in-service training courses for which is granted; these internally organized courses encourage the attendance of even those who would not actively enrol for this type of event elsewhere:

> *'Next month we have a day, I don't know how they call it, just a study day organized at the Nether Edge Hospital at our service with visiting lecturers of the Dental School coming. It's quite comprehensive really. I am not very good at going to actual courses I must admit'* (Int.No.49/Q.15.2).

Both the British Dental Assocation and the British Paedodontics Society have local branches that organize regular programmes of evening lectures. The Sheffield Orthodontic Study Circle runs similar programmes for the speciality. Finally community service dentists can attend any event outside their working days (half of them work part-time) or using their holidays.
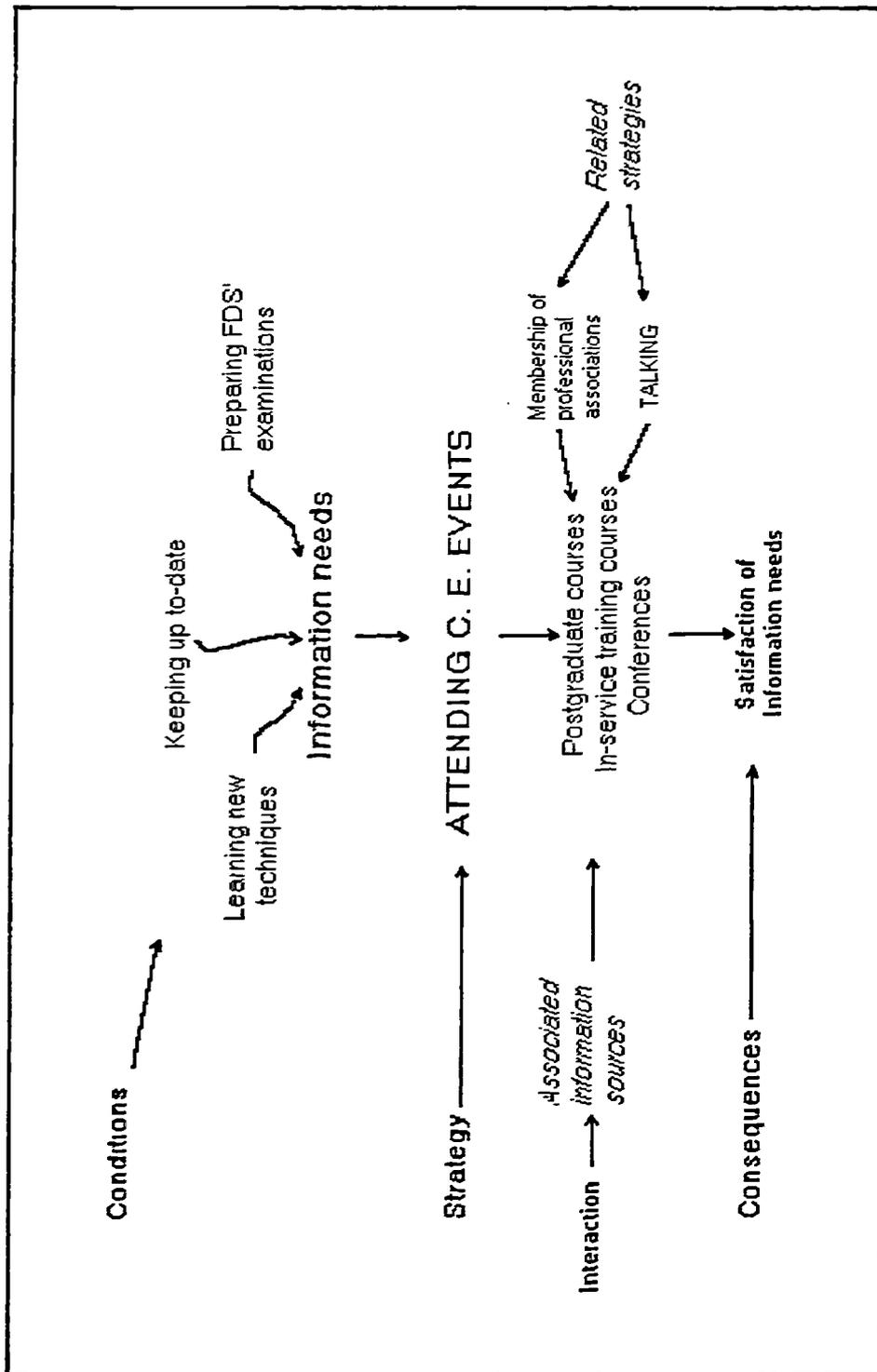
Figure 8.9: Attending/organizing continuing education events as a basic strategy for community service dentists

Table 8.13: Frequency of attendance at continuing education events

Event[a]	Non-attendance		Irregular attendance[b]		Regular attendance[c]		Intensive attendance[d]	
	%	()[e]	%	()	%	()	%	()
Courses	0.0	(0)	40.0	(6)	40.0	(6)	20.0	(3)
Conferences	6.7	(1)	13.3	(2)	40.0	(6)	40.0	(6)

[a]Data from Q.15 and 16.
[b]No specific frequency or less than once a year.
[c]At least once or twice a year.
[d]More than twice a year.
[e]Values in () indicate frequencies.

Table 8.14: Willingness of community service dentists to travel

Event[a]	Sheffield[b]		Region[c]		U.K.[d]	
	%	()[e]	%	()	%	()
Courses	33.3	(5)	26.7	(4)	40.0	(6)
Conferences	28.6	(4)	7.1	(1)	64.3	(9)

[1]Data from Q.15.2 and 16.2.
Attendance at local events only.
Attendance at events in the Trent Region and the North of England,
iding Glasgow and Edinburgh.
Attendance at events anywhere in the United Kingdom.
[5]Values in () indicate frequencies.

Attending... is related to membership of professional associations and Talking (See Figure 8.9). In the first case, community service dentists join associations relevant to their main specialities, i.e. the British Dental Association and the British Paedodontics Society, with its local branches in Sheffield. Orthodontics, Epidemiology and handicapped patients are the specialities of just a few community service dentists and consistently the membership of the respective specialist associations is much lower. But all of them are members of at least one professional association (See Table 8.15). We have aleady seen that the British Dental Journal and the Journal of Paediatric Dentistry are key information sources for Reading. Similarly the lectures organized by the local branches of the British Dental Association and the British Paedodontics Society are key information sources for Attending.... These events are considered the best service offered by these societies and by the other associations as well (Int.Nos.43;44;45;46;47;49;51;52;55/Q.13).

Another reason for Attending continuing education events is keeping in contact with other colleagues:

'Not the set of lectures but the coffee in between. That's for me far more interesting than some of these boring lectures' (Int.No.46/Q.13).

Table 8.15: **Membership of professional associations**

Associations[a]	CSDs	
	%	()[b]
British Association for the Study of Community Dentistry	6.7	(1)
British Dental Association	86.7	(13)
British Paedodontics Society	66.7	(10)
British Society for the Study of Orthodontics	13.3	(2)
British Society of Dentistry for the Handicapped	20.0	(3)
Sheffield Orthodontic Study Circle	20.0	(3)
Sheffield Paedodontics Society	6.7	(1)

[a]Data from Q.12.
[b]Values in () indicate frequencies.

'*I joined the second one* [Sheffield Paedodontics Society] *purely and simply because it is a local society and it keeps you daily in touch with your colleagues and what they are doing*' [As she is an orthodontist, she is not interested in its journal]- (Int.No.43/Q.14.3).

in that way it becomes a complement to **Talking**.

Attending continuing education events has never been mentioned as an initial strategy. Community service dentists implement it regularly for a constant up-dating or as a complement to other strategies.

Watching

This strategy is always used for learning new techniques, either individually (a video watched at home), at a conference (slides or videos as part of an oral presentation) or at postgraduate courses (tape slides programmes for teaching specific topics).

On the whole **Watching** appears as a passive strategy. The videos are watched because somebody brings them:

R: *I have recently seen some of the Dentistry Videos.*
I: *How do you obtain them?*
R: *Through my husband he does a session in practice* [a general dental practice] *and gets them from the practice and brings them home.*
(Int.No.42/Q.27).

because they are available at the general practice where some interviewees do part-time sessions:

R: *Sometimes... we get them in the practice.*
I: *What kind of materials?*

R: That's usually what the reps brought around to see a video. Last week a video came through I can't remember... Dentistry in practice or something like that, a monthly video.
I: and normally you obtain it from the reps of the dental companies?
R: or through the practice, yes.
(Int.No.50/Q.27).

or because they arrive through the post, but as in the case of the general dental practitioners[13], community service dentists do not know exactly why these videos come:

[The respondent has access to medical videos at the Health Centre where her clinic is. She also receives videos by post several times a year on different techniques. She receives them free but she does not know where they come from. She thinks that it has something to do with filling in forms as an undergraduate at some conference. She adds that she ought to find out about how she is getting the videos] (Int.No.51/Q.27.2).

The situation is similar regarding the use of slides or tape-slide presentations. They are watched at lectures, presentations or postgraduate courses (Int.Nos.47;48; 55/Q.27).

Only one interviewee who lectures at the dental school keeps a collection of slides for teaching purposes and the results of his research are also registered in slide form (Int.No.45/Q.29).

Watching is never used as an initial strategy and it has not been described in combined or complex patterns of information-seeking. It is regarded as more suitable than **Reading** in certain instances:

'There are clinical demonstrations of techniques which are best visual. I wouldn't say that there is no print counterpart but I think they are better visual' (Int.No.46/Q.46).

nevertheless it is not indispensable and 47% of the community service dentists do not use audiovisual materials at all (See Figure 8.10 and 8.11).

Using the library

This strategy is implemented to satisfy information needs provoked by various conditions, but it does not have the central role that it enjoys in the case of hospital/academic staff and postgraduate students. In the first place only 73% of the community service dentists uses library services (See Figure 8.12) and secondly those who use library services do so when other strategies have not succeeded in providing all the information.

Community service dentists prefer the University Medical and Dental Library but they use several other libraries as well, mainly the British Dental Association Library and other academic libraries at the institutions where they are reading for postgraduate degrees (See Figure 8.13).

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[13]See **Watching** page 88.

NO 47%
(7)

YES 53%
(8)

(Data from Q.27)
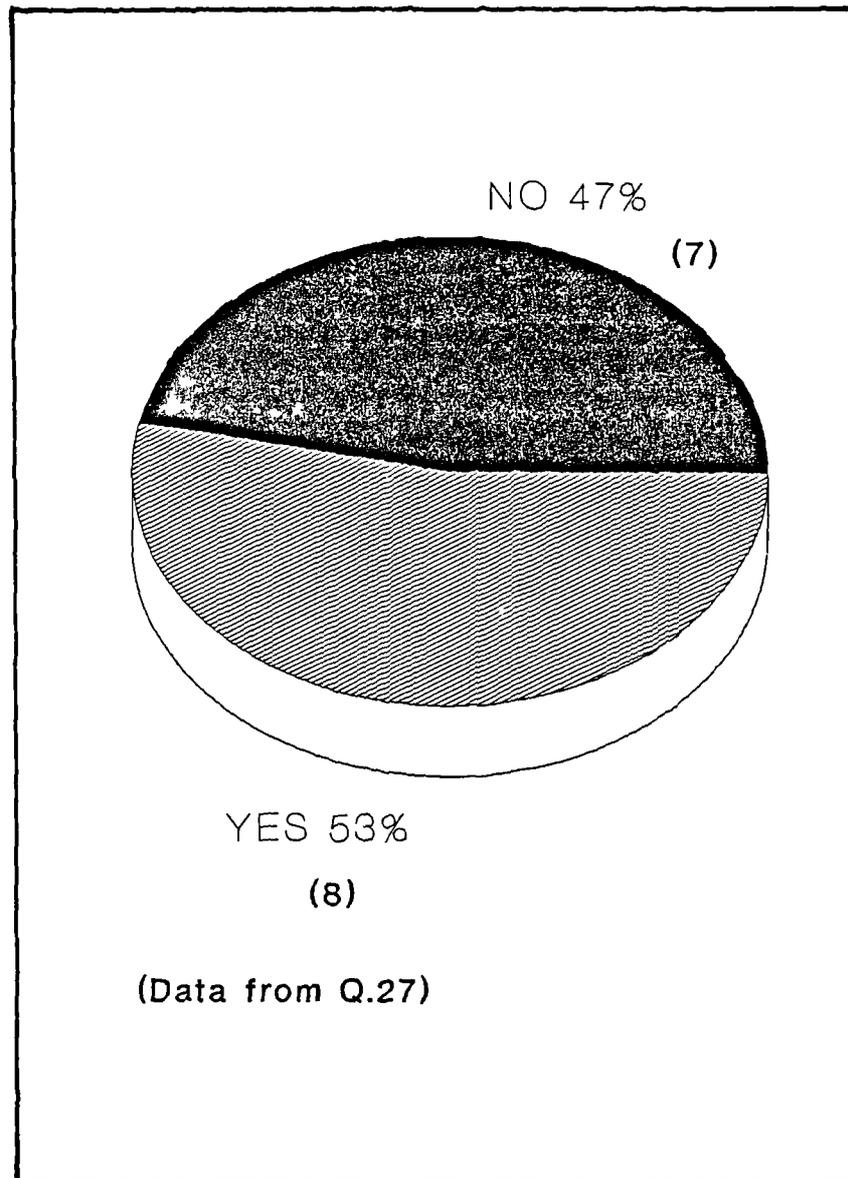
Figure 8.10: Use of audiovisual materials by community service dentists
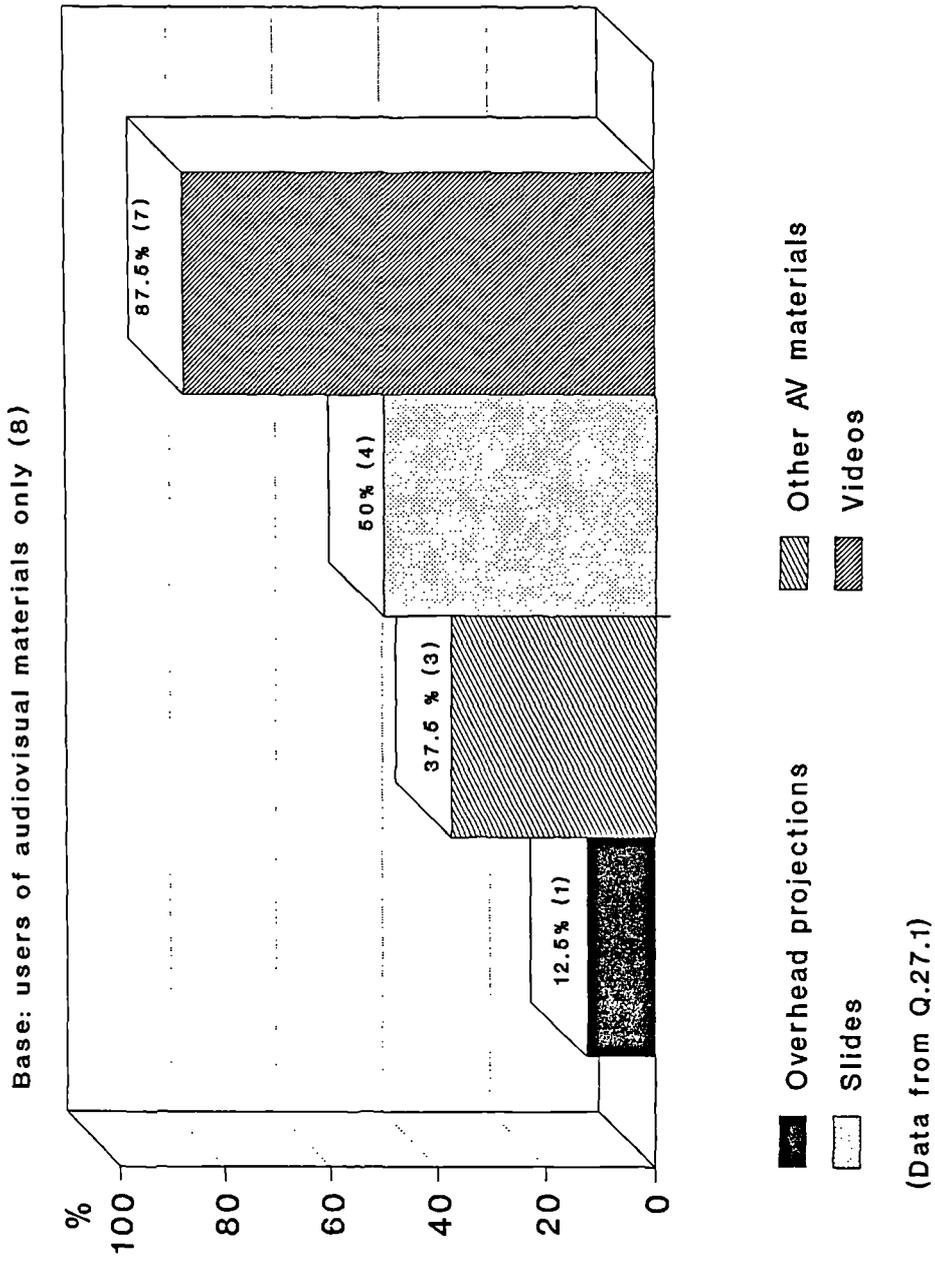
Figure 8.11: **Types of audiovisual materials used by CSDs**

YES 73%
(11)

NO 27%
(4)

(Data from Q.32)
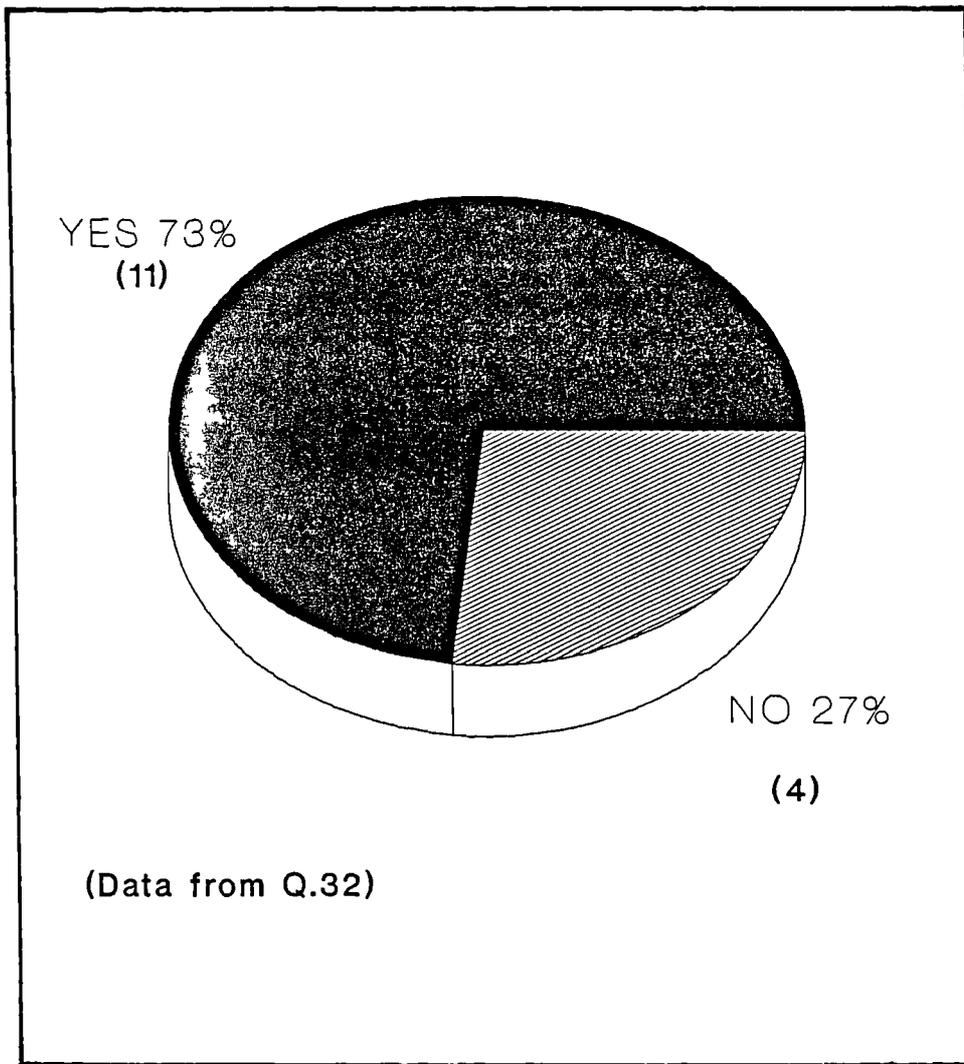
Figure 8.12: Current use of library services by community service dentists
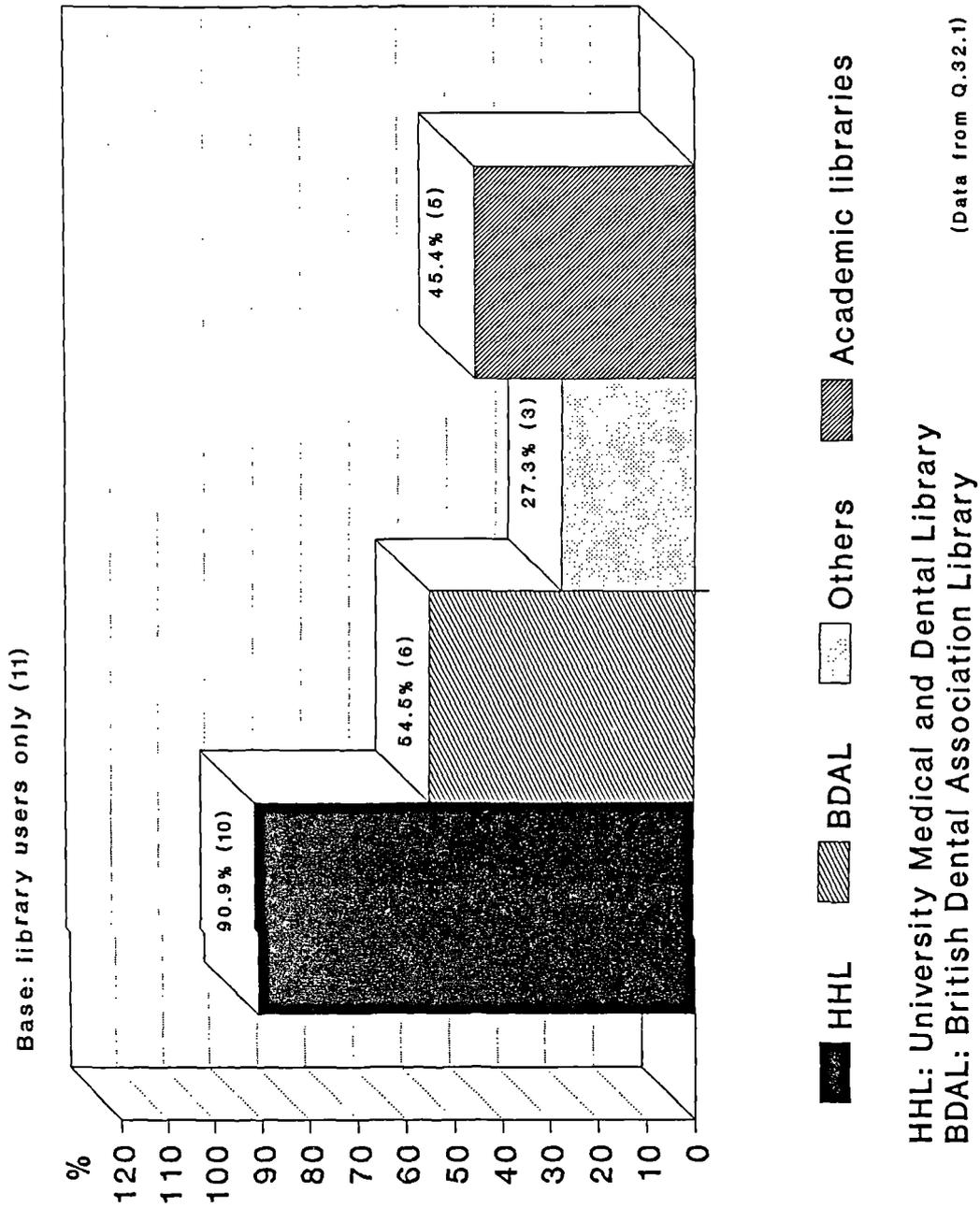
Figure 8.13: Libraries used by community service dentists

The majority of those who use the University Medical and Dental Library are active users with a valid library ticket (8) but two of them use the library for reference purposes only or using somebody else's ticket. On the other hand two of them used that library in the past when they were undergraduate students or worked at the dental hospital; and three of them have never joined the University Medical and Dental Library despite the fact that they are entitled to become members either as graduates of Sheffield University or as NHS staff (See Figure 8.14).

Community service dentists may visit the library to browse journals that they do not subscribe to:

> *R: ... But because I don't take the 'British Dental Journal' regularly, I go in there now and again to look up the back numbers. [...]*
> *I: Do you use the library for anything else?*
> *R: Very occasionally if I want to look up at something specific I need, I can't find the information anywhere else or from anybody else.*
> (Int.No.49/Q.33).

to find books on a particular subject:

> *R: I wanted some information about root canal fillings. So I went to the library and looked on the microfiche* [catalogue] *and then search on the shelves.*
> *I: Did you search for a particular book or did you search by subject?*
> *R: I search by subjects and what books they had.*
> *I: Which other services of the Hallamshire Hospital library do you use?*
> *R:* [None].
> (Int.No.45/Q.33).

to request a literature search on a specific topic:

> *R: When I was looking for more information on mouth sticks.*
> *I: What did you do?*
> *R: I went and asked the librarian to get me the references.* [She requested an on-line literature search (Q.42)].
> *I: When you find what you are looking for, what do you do? Do you borrow the material, do you read it there or do you photocopy?*
> *R: Photocopy.*
> *I: Do you use any other services of the library?*
> *R: Occasionally I borrow books.*
> *I: Not any other one?*
> *R: No.*
> (Int.No.53/Q.33)

· prepare a thesis for a postgraduate degree:

> *R: The medical library* [HHL] *I've used it regularly over the past two years to look up papers, papers that relate to my thesis.*
> *I: Which services of the library have you used?*
> *R: ...the "Index Medicus", the "Index to Dental Literature", then when you give them headings and they put them into their computer ... and*

> *gives you a print-out of any journals related ... any articles ...* [an on-line literature search].
> *I: Do you borrow books?*
> *R: Yes also.*
> *I: Did you ask for interlibrary loans?*
> *R: Ah... I asked for ... they photocopied some papers for me when they weren't available in the library.*
> (Int.No.48/Q.33).

or to prepare a lecture:

> *R: I wanted ... I was asked* [in 1988] *to talk about a certain aspect of treatment so I had to go and look up the journals for certain treatment ...*
> *I: How did you look for the information?*
> *R: I think I'd probably already got an article by the person so I used the references at the end of that article I followed them up. Also I may have used the Index* ["Index to Dental Literature"].
> (Int.No.44/Q.33).

Using the library is a strategy implemented by community service dentists to find out information about specific medical and dental conditions, dental techniques and equipment; to prepare publications and lectures; to carry out research and post-graduate studies; and to keep up-to-date (See Figure 8.15).

This strategy shows the three main variations that we have found in the case of the hospital staff[14]. Community service dentists perform

- random subject searches: they browse journals that cover their subject interests (Int.Nos.43;46;49/Q.33);

- document searches: they look for specific articles or books whose references they have already obtained from another document or a colleague (Int.Nos.43;44;54; 55/Q.33);

- formal literature searches: they carry out manual searches in the library catalogue (microfiche form), the *Index to Dental Literature*, *Index Medicus* or they request an on-line literature search from the library (Int.Nos.45;48;51;53;54;55/ Q.33 and Table 8.16).

The community service dentists use mainly the *Index to Dental Literature* to search by author and by subject headings. Author searches are simple but manual subject searches are different:

> *'Looking up at ... if I am looking up something specific so say and particularly related to the publications that I write. I am looking up publications at the moment about dental care for paediatric oncology patients. So I go ... I look up all ... look through all the references for the last ten years, under "Leukaemia" and... [...] this is a terribly laborious work. So really just doing literature searches, that's basically all that I use it for. [...] I personally think that some of the topic headings... it's not the right word.*

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[14]See page 153.

Table 8.16: Formal literature searches

Source[a]	YES		NO	
	%	()[b]	%	()
Index to Dental Literature	60.0	(9)[c]	40.0	(6)
On-line databases	40.0	(6)[d]	60.0	(9)

[a]Data from Q.38 and 41.
[b]Values in () indicate frequencies.
[c]Interviewees have used the "Index to Dental Literature" at least once during the last five years.
[d]Interviewees have requested at least one on-line search during the last 10 years.

I: Subject headings?
R: Subject headings they are too vague, they are not specific enough and equally there are not enough of them and there is not enough cross-reference information in it. It just gives you some cross reference information but you've got to ... you probably know yourself, you've got to sit down and you've got to do a bit of a brainstorm and think now what I'm looking for and occasionally, you just hit on the right thing. I can't find any specific way of doing that with the Index and it doesn't help you to come to that sort of decision. (Int.No.45/Q.39;40.1).

Manual searches in the *Index to Dental Literature* are not only time consuming but difficult because of the shortcomings of the *Medical Subject Headings List (MESH)* regarding dental topics, and community service dentists have described this problem better than other dental professionals (Int.Nos.45;46;55/Q.39;40.1). General dental practitioners do not use library services enough and even less the *Index to Dental Literature* to be able to judge the performance of the indexing language. On the other hand, hospital/academic staff and postgraduate students carry out searches routinely in subjects of their speciality and they are used to interpreting how the indexing language works. But community service dentists are in a different situation, they carry out manual searches regularly but not frequently enough to know how MESH is applied to dental topics that may belong to any speciality. Their comments on the *Index to Dental Literature* have pointed out the main constraints of MESH applied to Dentistry: i) the subject headings are not specific enough from the dental point of view, for example papers on *straight-wire technique* or *porcelain brackets* are indexed under ORTHODONTIC APPLIANCES, but there are no specific subject headings by name of technique or kind of bracket; ii) the printed version of the *Index to Dental Literature* has a very poor level of cross references from one subject heading to another, for example there are no subject headings or qualifiers indicating kind of patient (children, elderly people, etc.); a search on *dental care for paediatric oncology patients* has to be done under each specific condition as Int.No.45 describes above, and there are no cross references from one condition to another, as a consequence in a manual search the user has to remember and think about all possible conditions.
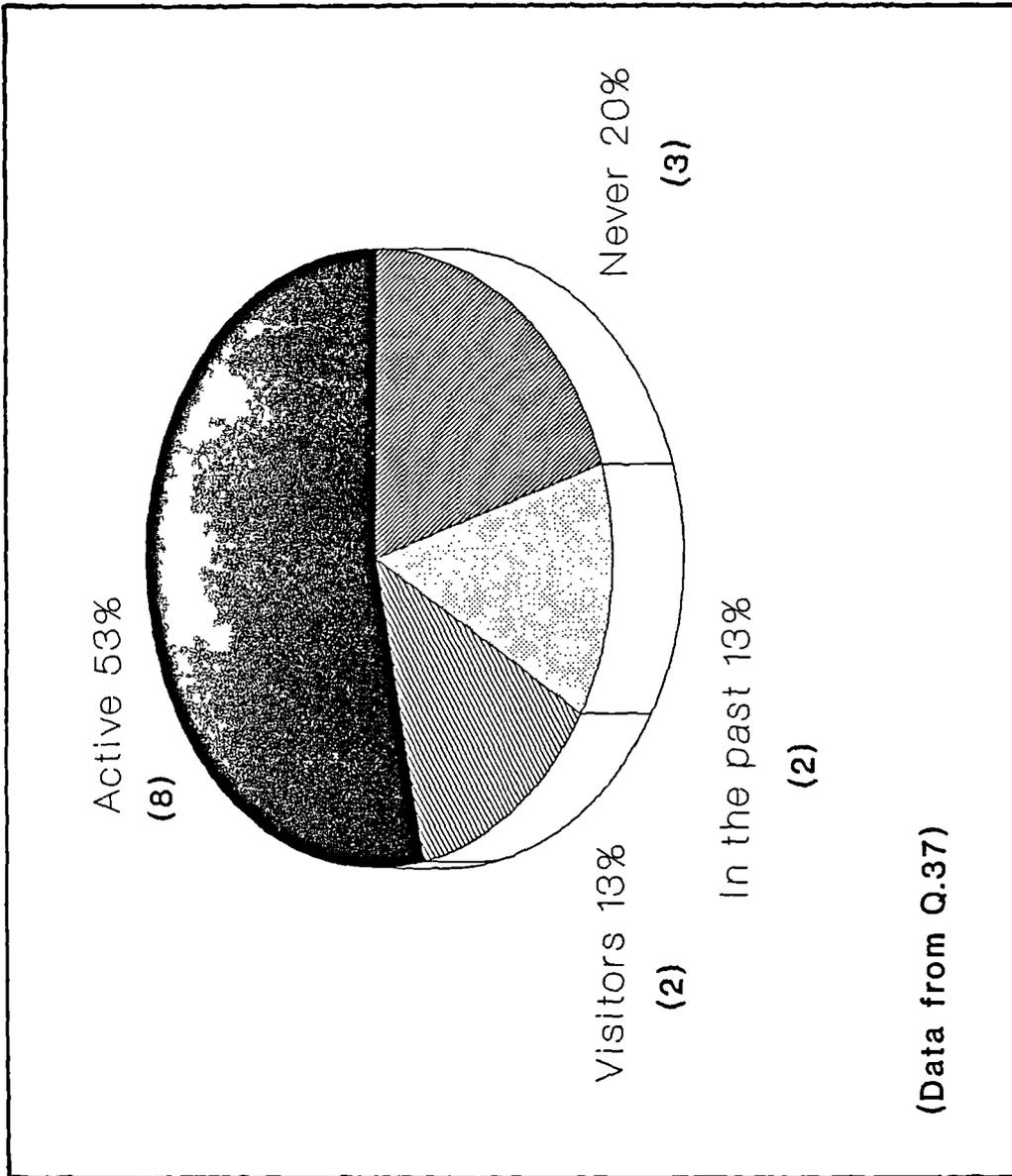
Figure 8.14: Use of the University Medical and Dental Library (HHL) by community service dentists
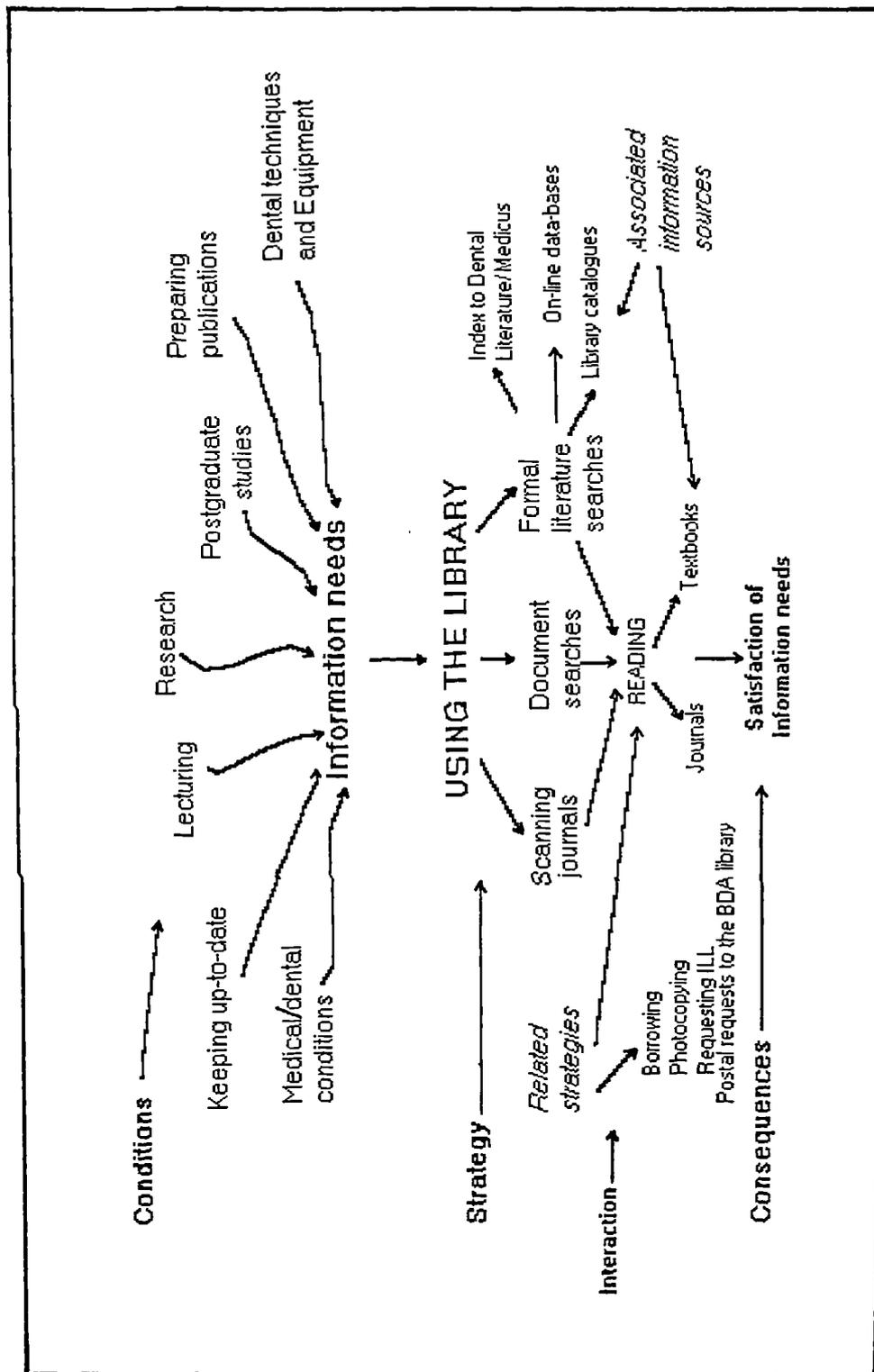
Figure 8.15: Using the library as a basic strategy for CSDs

On-line literature searches are usually requested to complement a manual search previously done (Int.Nos.45;48;54/Q.38;42). Community service dentists do not carry out these searches themselves, they ask the University Medical and Dental Library or other university libraries where they are studying for them. Medline is the only data base used and all the requests are subject searches using key-words; they neither request citation searches nor download extensive lists of references for a personal data base.

Using the library has never been identified by community service dentists as an initial strategy except in the case of information related to postgraduate studies (Int.No.54/Q.11). It appears in combined and complex patterns as a complement to Reading, Talking and Enquiring as we will see in the next section. This characteristic is consistent with the reasons for not using library services (Int.Nos.42;47;50;52/Q.34):

> *'I suppose because the information that I've got from other sources is sufficient. If there is a book that I want it... I would tend to buy, if it is a textbook I probably have a look at it, either borrowed from a colleague and then decide whether I want it for myself'* (Int.No.47/Q.34).[He finds all the information he needs by **Enquiring** from the patient and **Reading** written/printed literature (Q.1;11)].

> *I: Do you use any library in relation to your work?*
> *R: I haven't done for two and a half years ... I don't really find it necessary because I've qualified fairly recently. All my textbooks are up-to-date and I get the journals at home. I don't have any project or anything like that to research.* (Int.No.50/Q.34) [**Reading** and **Talking** are her preferred strategies (Q.1;11)].

8.3.2 Patterns of information-seeking behaviour

Community service dentists –like hospital staff– have described simple patterns of information-seeking for almost every condition (See Figure 8.16).

In the case of patient information related to the diagnostic stage, the strategies are **Enquiring** or **Reading**:

> *R: ... So when a patient comes the first thing you have to do it is to get information regarding their... if they are suitable for dental treatment. Information about consented treatment ... that the parents know what people are going to do ... they understand what I'm going to do...*
> *I: How do you get the information you need about the patient?*
> *R: Well ... I would get ... from a verbal request...*
> *I: to the patient or to the parents?*
> *R: Both really it depends on the age of the patient, you get the background information from the child. Then you speak to the parents. With a very, very small child of course I would speak to the parents straightaway.* [The dialogue with patient/parents would be enough with simple cases. He would need to contact the medical doctor or even the hospital with more complicated cases].
> (Int.No.47/Q.1).
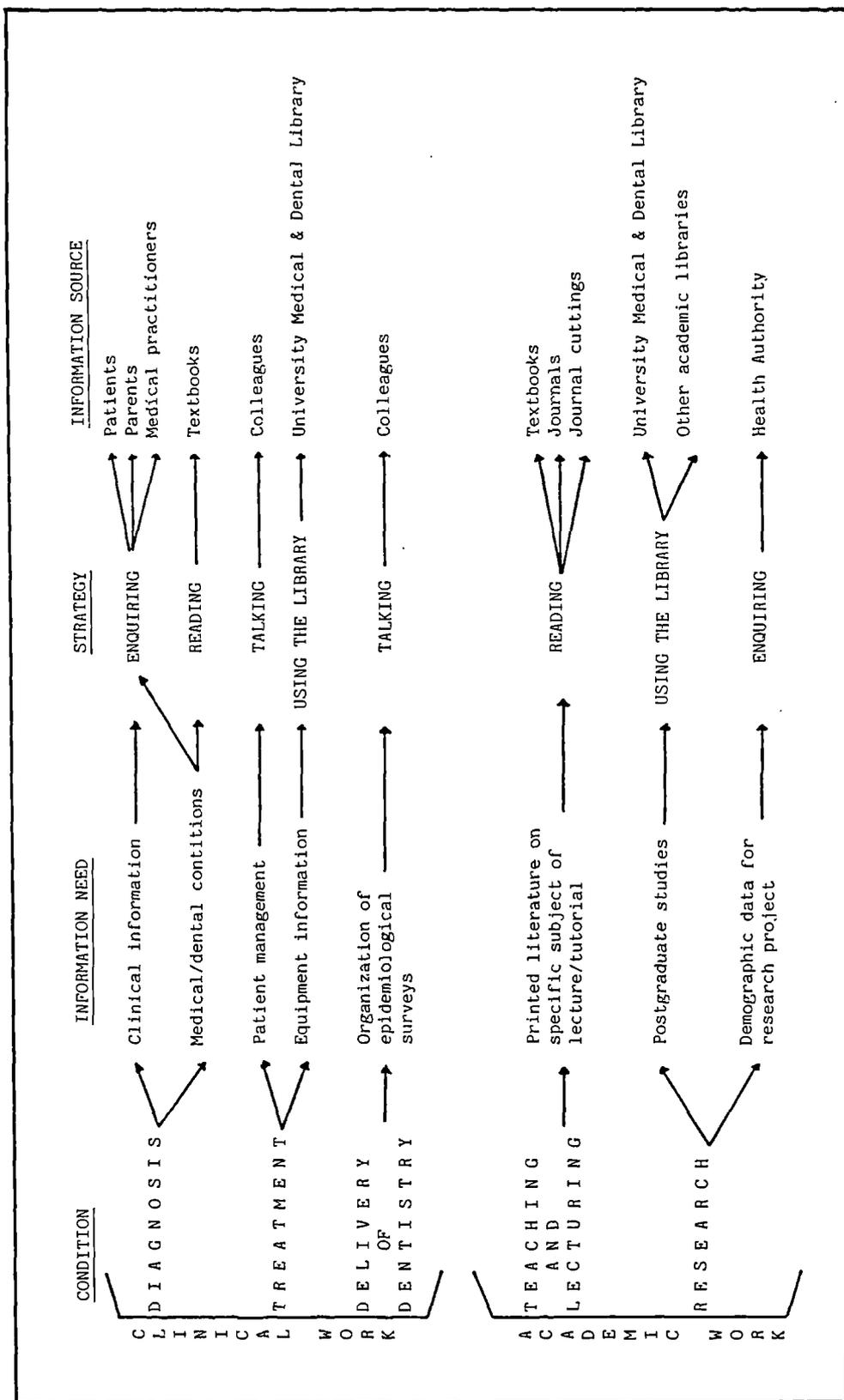
Figure 8.16: Simple patterns - Community service dentists

> R: I think there was [a situation] when I wanted to look up a problem of
> bone reabsorption in relation to teeth in a child.
> I: How did you look for this information?
> R: I looked in a book, that we had at the clinic.
> I: Did you do anything else?
> R: No.
> (Int.No.44/Q.1).

Enquiring is the preferred strategy to obtain patient information for routine cases
(Int.Nos.47;52/Q.1) and **Reading** for more serious conditions (Int.Nos.44;46/Q.1).

Talking is a key strategy to solve information needs related to patient manage-
ment:

> R: ... I've been seeing children with a very severe caries problems and I
> needed information about how best to deal with it.
> I: How did you find this information?
> R: I went to a senior dental officer who was working with me at that time
> and I got the information from him.
> (Int.No.42/Q.1).

> R: ... Maybe just a second opinion on a child that we are treating, some-
> thing like that. That's most often.
> I: How do you obtain the information in that case, what do you do to find
> a second opinion?
> R: Well, in our service we have ... I'm an ordinary dental officer, we
> have senior dental officers who are specialists and the first call is on them
> really. Whichever one we think will be most helpful and it is ordinarily by
> telephone or just going on our central clinic when we know they will be
> there.
> (Int.No.49/Q.1).

> R: Dealing with a medically compromised child, needing extractions with a
> heart problem.
> I: How did you find the information?
> R: I was working at the Children's Department at the Dental Hospital, so
> I asked a colleague.
> I: Did you look for information in any other way?
> R: No.
> (Int.No.53/Q.1).

It is also used for other situations, for example:

> '... And having said that when it comes to, rather than clinical work, when
> it actually comes to technicalities of the organization of the surveys, so how
> to actually go about doing something, then we usually contact our superior
> who is in fact [...] for advice and again that probably happens every two or
> three times a week. I have to contact him or discuss something with him,
> about the provision of the service that we provide' (Int.No.45/Q.1).

As we have already seen, **Talking** is always preferred when community service dentists seek advice instead of just a technical explanation[15].

Using the library appears in the context of equipment information:

> *'The lights of the light curing machine, I think that I read somewhere that the strength of the light goes before the bulb goes, so therefore I had to go and look up a paper at the library...'* (Int.No.48/Q.1).

but this is an exceptional use of this strategy in a simple pattern. **Using the library** is applied mainly in the context of postgraduate studies, both on its own or combined with others.

As academic tasks provoke information needs largely dependent on printed literature, the simple patterns are centred on **Reading** or **Using the library**:

> [The respondent has a teaching session at the dental hosital once a week. He obtains the information he needs for the tutorials from his personal collection of books and journal cuttings] (Int.No.46/Q.1).

> [The respondent gives lectures to the staff of homes for elderly people. He obtains the information relevant to the subject of the lecture from books and journals borrowed from colleagues or of his own] (Int.No.47/Q.71-76).

Research projects may require other kinds of data apart from literature, for example demographic data, in which case **Enquiring** is the selected strategy (Int.No.55/Q.1).

The common characteristic of simple patterns is that in each case the selected strategy provides the most direct and fastest access to the required information: the dialogue with the patient to obtain his/her clinical history, a textbook to check on a condition, a colleague to discuss a case, the library to make a literature search. If this initial strategy succeeds no further information-seeking is necessary.

Combined patterns are always centered on **Reading** or **Using the library**. In the case of information needs provoked by clinical tasks the patterns of information-seeking are a combination of face-to-face communication and use of written/printed literature (See Figure 8.17). **Enquiring** and **Talking** appeared combined with **Reading** or **Using the library**:

> [The respondent received three weeks ago a child suffering from 'Swchaw-man Diamond Syndrome'. A rare medical condition that she had never come across before and she needed information about because it was affecting the child's diet and therefore the child's dental health. First of all she rang the general medical practitioner in charge of the patient but he was not very helpful. Then she went to the Medical and Dental Library at the university and requested an on-line literature search on that particular condition.] (Int.No.51/Q.1).

> *R: Looking at a technique for a re-implanted tooth.*
> *I: How did you look for the information?*
> *R: In a textbook.*

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[15]See **Talking** page 188.

I: Where did you get the textbook?

R: It was my own textbook.

I: Here [at the clinic] *or at home?*

R: At home.

I: Did you look for information in some other way for this particular case?

R: Yes, I telephoned somebody.

I: Who was "somebody"?

R: A colleague.

I: In that particular case did you do anything else?

R: No.

(Int.No.50/Q.1).

In the case of academic tasks, the combined patterns are focused on **Using the library**; this initial strategy is complemented by **Reading** or **Enquiring**:

[The respondent is describing the information he needs to prepare a paper]:
'You need information about the topic itself so again it's the library, references textbooks on the subject, an up-to-date literature search [...] Also occasionally we also obviously need the patient's medical and dental records as well' (Int.No.45/Q.75).

R: I wouldn't say recently but I gave a talk a few months ago and I needed an awful lot of information for the talk so I had contacted various sources of information.

I: Which sources were these?

R: I rang up the library ... the British Dental Association Library. I just rang them up and say "Could I have information on that particular topic".

I: Which was this topic?

R: It was on Dental Health and Ethnic Minorities so I wanted to know everything that had been written on both children and ethnic minorities.

I: Did you seek information in some other way?

R: No, I found that brilliant really because I think they had everything. They sent me all... Oh, sorry, I also enquired the group in Sheffield specialized in black Sheffielders and I got the ... you know ... how many of the population ... [He cannot remember the exact name of the organization].

I: What did you require from them?

R: Well, the ... basically the census, what sort of population lives on various areas, what the ethnic origin is.

(Int.No.56/Q.1).

Reading is a natural continuation of **Using the library**; **Enquiring** provides a different kind of information.

Complex patterns have been described in the case of patients with special needs (Int.No.45/Q.1), examinations for the Fellowship in Dental Surgery (Int.Nos.45;51/Q. 68-69) and postgraduate studies (Int.No.55/Q.68-69):

[The respondent looks after children with special needs]. *'... so I am constantly having to go to the library and my own reference books and journals that I receive to get information from those [...] The third way that*

I seek information and again this can be actually about specific patients or about providing the services in general is actually discussing with colleagues because I travel, I move around a lot in the job. I have the responsability of contact lots of different people, and ask them about particular problems' (Int.45/Q.1).

[The respondent is preparing for the Fellowship in Dental Surgery examinations and describes his information needs as follows]: *'Basically past papers are always a very good starting point for exams. Syllabuses... and then it's just a matter of reading textbooks and catching upon appropriate up-to-date literature really and make sure you are up-to-date on all the important topics. So again it's library work ...'* [He writes to publishers to obtain past papers, he has made enquiries from the Royal Colleges of Surgeons about the syllabuses and he gets texts and references from the library or his own personal collection] (Int.No.45/Q.68-69).

[The respondent is preparing for the primary examinations for the Fellowship in Dental Surgery. She needs mainly textbook information which she obtains from her own textbooks or from the library. She intends to do a course at the dental hospital the following term; it is a specific course for those preparing for these exams] (Int.No.51/Q.64;68-69).

[The respondent is reading for a Master in Community Dental Health. She obtains the information on the different topics of her course from seminars and lectures at the school, group work and private study which implies use of her own collection of documents as well as that of the library] (Int.No.55/Q.69).

All these instances require extensive use of printed literature, hence the constant implementation of **Reading** and **Using the library**; but in a complex pattern these strategies are complemented by **Talking, Enquiring** and **Attending...** (See Figure 8.18)

Community service dentists have complex patterns of tasks (different jobs, in different places, on different days) centred on clinical duties, therefore simple patterns of information-seeking are more effective and they suit their style of work better. This fact explains why simple patterns may be implemented for any condition and combined ones only appear when the initial strategy has not succeeded completely or when different kinds of information are required (articles and demographic data). **Reading, Talking** and **Enquiring** are the key strategies of their information-seeking behaviour regarding their clinical work but **Reading** and **Using the library** are the essential ones regarding their academic activities. In the first case their information-seeking behaviour resembles that of the general dental practitioners, in the second case their information-seeking behaviour is similar to that of hospital staff.
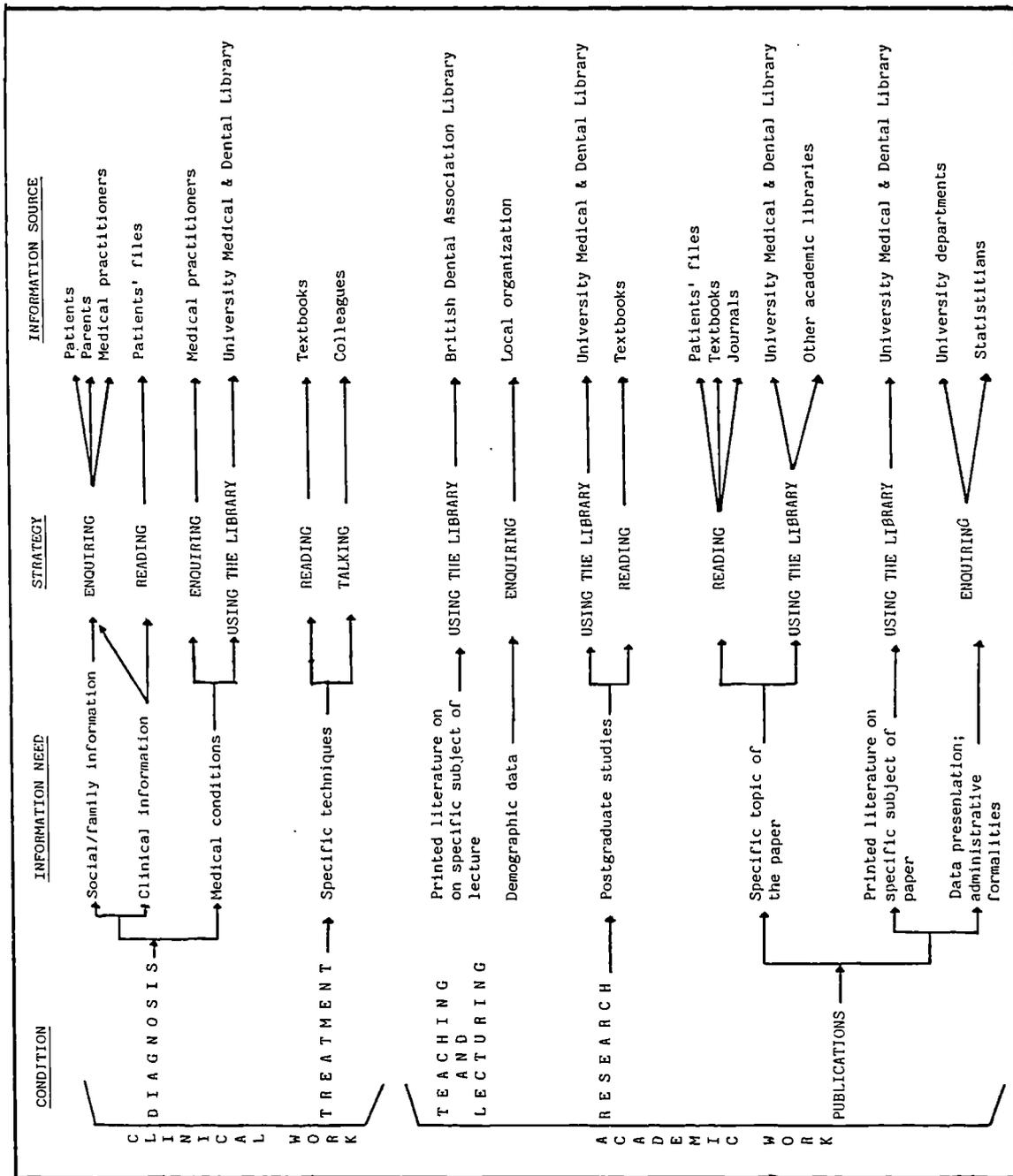
Figure 8.17: Combined patterns - Community service dentists
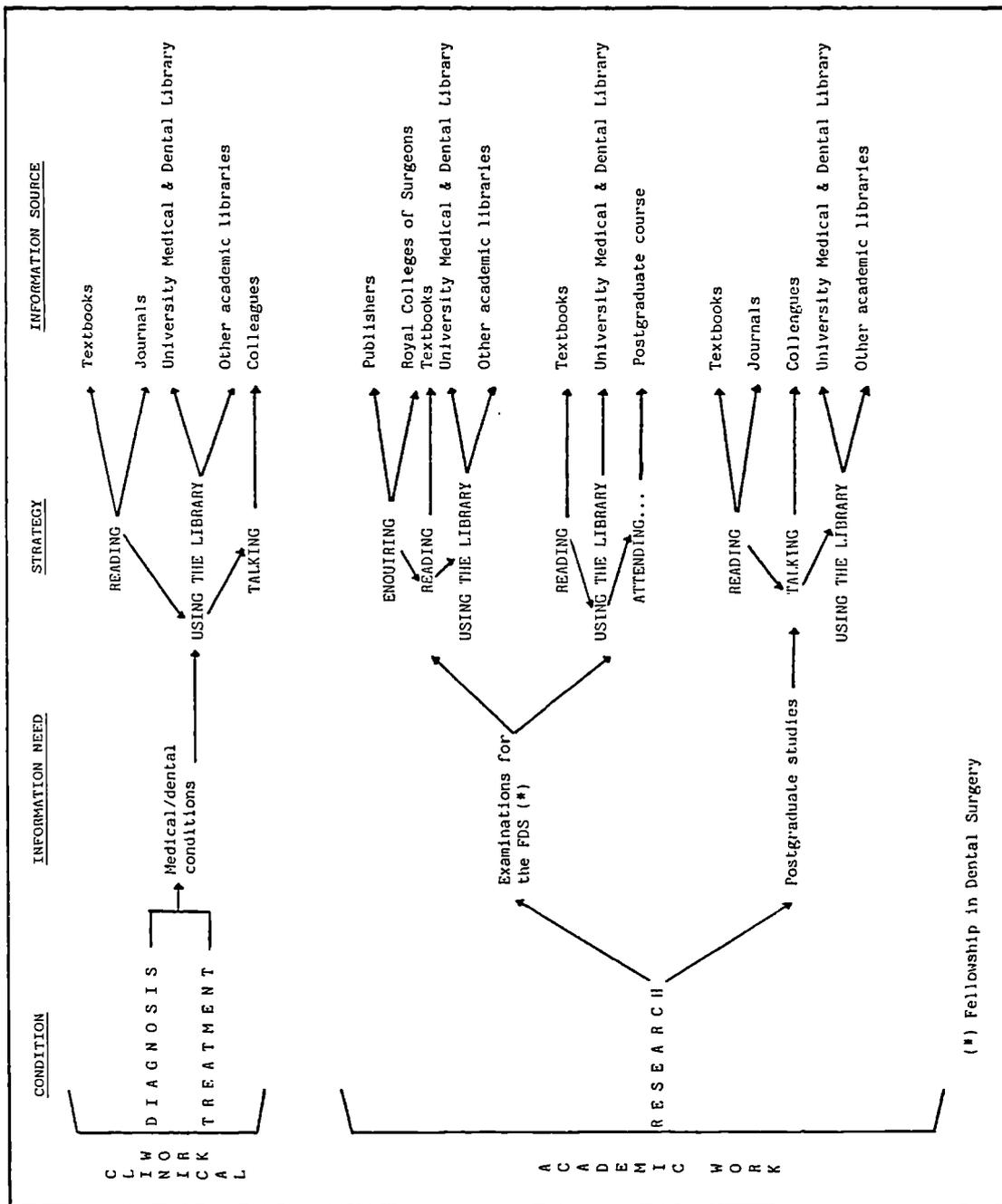
Figure 8.18: Complex patterns - Community service dentists

Chapter 9

The Use of Information by Academic Staff

9.1 The academic staff

I interviewed 83.3% (20) of the dentists who worked at the School of Clinical Dentistry, University of Sheffield. Only four dentists did not take part in the study; three of them declined, and one never replied to the invitation (See Figure 9.1).

The 20 dentists who took part in the study qualified between 1954 and 1980; their professional age ranged from more than 30 years to 10 years in practice and it was the only group in the study not including some young graduates (See Table 9.1). The majority of them graduated from universities in the north of England (Sheffield, Manchester, Leeds, Newcastle and Liverpool); unlike the general dental practitioners and the hospital staff, the graduates from Sheffield University were not the largest group (See Table 9.2). The academic staff showed the highest percentages of postgraduate training since postgraduate qualifications are essential for an academic career; 75% had got a professional qualification from one of the professional colleges (for example, a Fellowship from the Royal College of Surgeons of England); 75% had got postgraduate degrees at masters or doctoral level and 20% were reading for a Ph degree at the time of the interview. Only three interviewees did not have any postgraduate qualification (See Table 9.3 and Figure 9.1).

They represented all the grades of the academic scale: professor, senior lecturer and lecturer. The refusals were distributed almost evenly throughout the grades so no single grade was underrepresented, however the refusals did affect the representativeness of each speciality[1] (See Table 9.4).

They worked full-time at the School of Clinical Dentistry of Sheffield University, which at the time of the study did not have a purpose-built building[2]. Their actual place of work was the Charles Clifford Dental Hospital, the lecturing rooms at the Medical School and several offices and laboratories in houses near the dental hospital; all these sites were within walking distance of each other.

At clinical level there is a constant sharing of resources between the school and the hospital; academic and hospital staff share premises, equipment and clinics.

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[1]See Table 9.5 and page 224.

[2]In June 1989, when I interviewed the academic staff, the plans for the new building of the dental school were advanced enough, but the works did not start until October 1989.

Response rate

Refusals

16.7%
(4)

Interviews
83.3%
(20)

Postgraduate training

No postgraduate
qualifications

15%   **(3)**

85%

(17)

Some postgraduate qualifications
(It includes current studies)

(Data from Q.50 and 61)
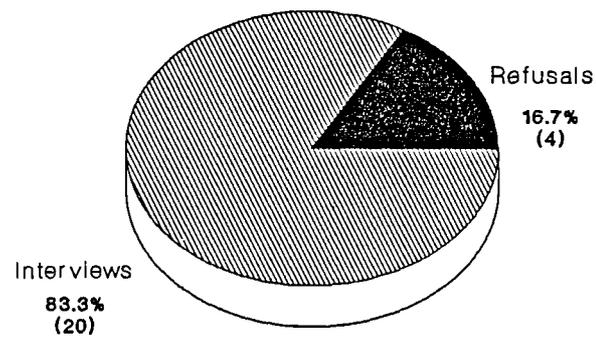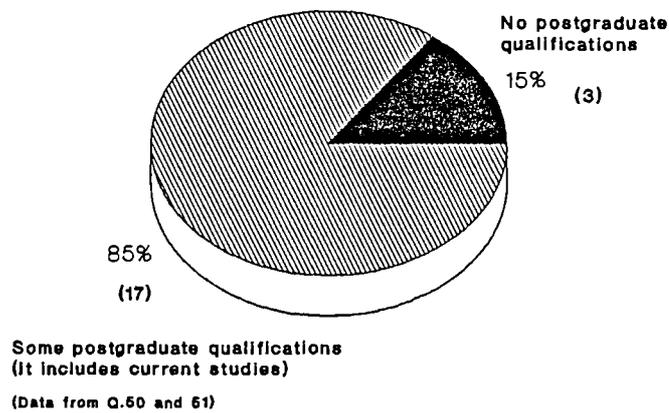
Figure 9.1: Response rate and postgraduate training of academic staff

Table 9.1: **Interviewees by year of graduation**

Year[a]	Graduates	%
1954	1	5.0
1955	1	5.0
1956	1	5.0
1960	1	5.0
1963	1	5.0
1964	2	10.0
1967	1	5.0
1968	4	20.0
1969	2	10.0
1971	2	10.0
1975	1	5.0
1978	1	5.0
1979	1	5.0
1980	1	5.0
TOTAL	20	100.0

[a]Data from Q.48.

Table 9.2: **Undergraduate training by dental school**

University[a]	Graduates	%
Sheffield	4	20.0
Manchester	3	15.0
Leeds	2	10.0
Newcastle	2	10.0
Liverpool	2	10.0
London	5	25.0
Wales	2	10.0
TOTAL	20	100.0

[a]Data from Q.49.

Table 9.3: **Postgraduate training**

Level of training[a]	YES		NO	
	%	()[b]	%	()
Professional qualifications[c]	75.0	(15)	25.0	(5)
Postgraduate degrees	75.0	(15)	25.0	(5)
Current postgraduate studies	20.0	(4)	80.0	(16)

[a]Data from Q.50 and 51.
[b]Values in () indicate frequencies.
[c]Membership and Fellowship of the Royal Colleges of Surgeons.

Table 9.4: **Status in the university**

Status[a]	Interviewees	%
Professor	4	20.0
Senior Lecturer	7	35.0
Lecturer	9	45.0
TOTAL	20	100.0

[a]Data from Q.56.

Table 9.5: Speciality

Speciality[a]	Interviewees	%
Restorative Dentistry[b]	9	45.0
Oral Pathology	3	15.0
Oral & Maxillo-Facial Surgery	2	10.0
Orthodontics	2	10.0
Children's Dentistry	3	15.0
General Dental Practice	1	5.0
TOTAL	20	100.0

[a]Data from Q.59.
[b]It includes Periodontology and Prosthetic Dentistry.

Academic staff rely partly on the same team of paradental staff that helps their colleagues at the dental hospital; for example, dental surgery assistants, hygienists, radiologists are usually employed by the health authority; other technical staff that works in the laboratories and secretaries are university staff. Their patients mainly come under the National Health Service, only seven interviewees indicated that they received some private patients, between 1% and 5% of the total intake (Int.Nos.16-39/Q.54).

They worked in the main dental specialities: *Restorative Dentistry, Oral Pathology, Oral and Maxillo-Facial Surgery, Orthodontics, Children's Dentistry and General Dental Practice.* The largest group was that in *Restorative Dentistry*, which was the largest department at the school and included *Conservative Dentistry, Prosthetic Dentistry and Periodontology.* The oral surgeons group was underrepresented because three of the four dentists who refused to be interviewed belonged to that speciality (See Table 9.5).

Their pattern of tasks was opposite to that of the hospital staff. Their main activities were lecturing, supervision of undergraduate and postgraduate dental students and their own research projects. Clinical work (i.e. treating patients) at the dental hospital was a complement to the former.

Finally this was the only group of the study where all the interviewees were active in producing papers for publication, audiovisual materials and even computer software for dental applications; the latter constituted the only example in the whole study.

9.2   The conditions for their information needs

Academic staff have a varied pattern of tasks with the emphasis on academic ones. Their information needs related to clinical work, are within the three areas we have already identified for other groups: *diagnosis, treatment* and *delivery of dentistry* (See Figure 9.2).

As clinicians they need information about the patients:

'*You want to know about the previous treatment, why they are sitting there now.* [Why they have been referred to the dental hospital]. *You need to*

talk to them and the parents to obtain information and to reassure them. If it wasn't for the patients there would be no reason for us' (Int.No.25/Q.4);

about specific medical and dental conditions:

'Because we are sent children with unusual or fairly rare clinical problems which sometimes are not found even in textbooks and even if they are found in textbooks, the textbooks are out of date, for example children with acute leukaemia: clinical patterns and diagnosis are the same but the treatment has changed a lot' (Int.No.37/Q.4);

'Because the nature of the subject [diagnostic pathology] is such that one is always being confronted at a very large spectrum of Pathology with variations, minor variations often within the same disease condition, but which are sufficiently different to make you think twice and therefore one is constantly, in my experience looking for evidence that someone else has observed this variation may have said something about' (Int.No.21/Q.4);

about techniques in each speciality:

'In the field of clinical dentistry you need to keep up-to-date with clinical techniques and materials and also with research in order to modify your dental practice according to the results of research' (Int.No.33/Q.4);

about dental products and clinical trials:

'I've been asked to do a clinical trial of a mouth spray and I was checking to see if one of the ingredients was in the list of allowed additives to food in order to write for ethical approval' (Int.No.24/Q.1);

and about administrative aspects of hospital work:

'My job is very varied because I am a clinician, I am also the [...] of the Dental Division' [3]. [He is engaged in research, has got junior staff to supervise and needs information dealing with administrative matters. He needs information in all these categories] (Int.No.23/Q.3).

In practice the scope of their clinical information needs covers everything from clinical histories to hospital management and information seeking is a continuing process:

R: I can think of a dozen examples. If the example is "clinical" I need information on ... I'm new here, I've only been here [...] so I need information about where things are, what services are ... Also I need information on various diseases so I would go and look up things in the library or even from my own books or ask colleagues. There are so many instances that I could go on and on.
I: This is a clinical example, which are other instances?
R: Services, information about diseases, availability of equipment and information concerning waiting lists, other clinicians for example if I need to refer a patient. I think these are probably the main examples.
(Int.No.27/Q.1)

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[3]The board governing the dental hospital.
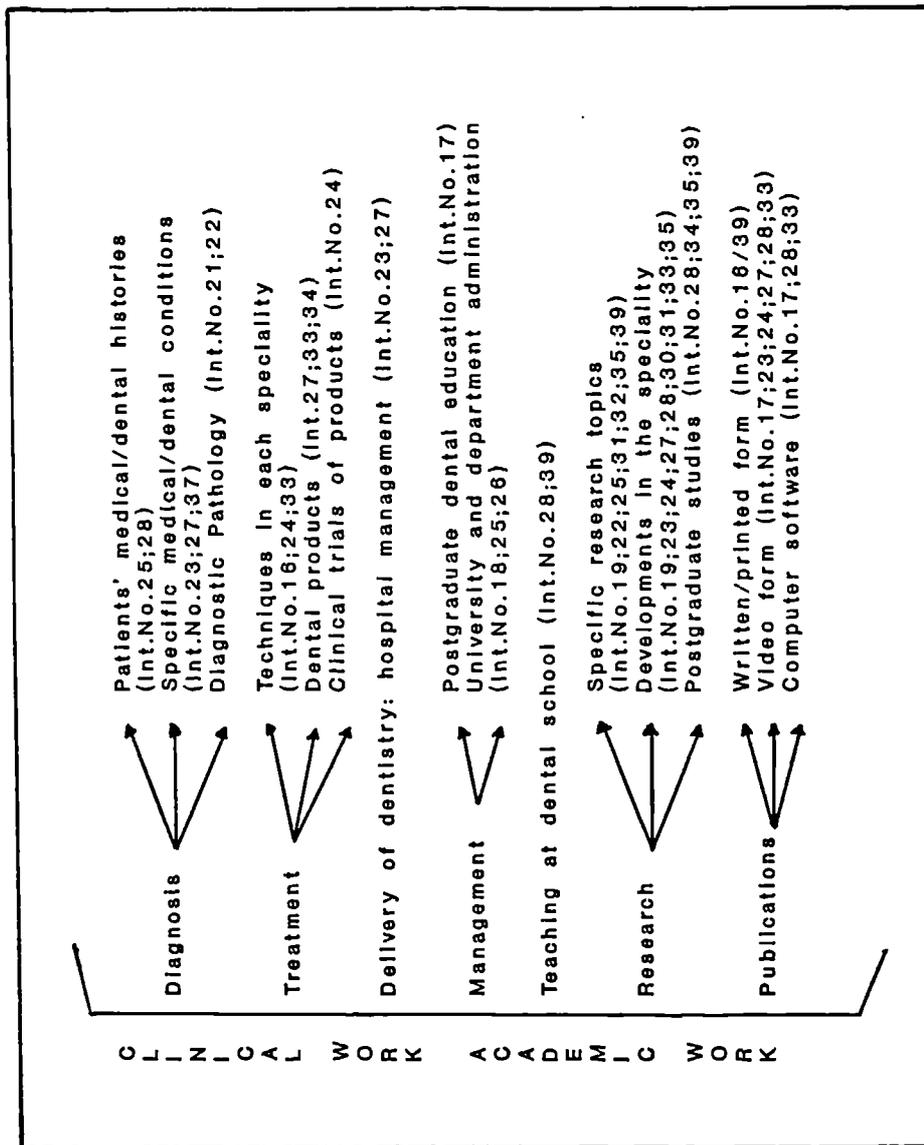
Figure 9.2: Conditions for information needs of academic staff

Their information needs related to academic work are in the areas of *dental education, management, teaching, research* and *publications* (See Figure 9.2).

As academics they need information about the running of the dental school, the organization of postgraduate dental education and dental education politics (Int.Nos.17; 18;25;26/Q.3). But as in the case of hospital staff, academic staff does not perceive management information needs as the most important ones. Whenever they have described conditions in detail, these conditions refer to clinical information or research work.

A similar situation is observed in the case of teaching and lecturing, one of their principal tasks but by no means the most demanding one in terms of information. Only two interviewees have mentioned this condition (Int.Nos.28;39/Q.1;3) and the reason is that they are relatively new lecturers without previous teaching experience. The rest of the staff are experienced lecturers, so what they teach is familiar to them; as one interviewee said:

> *'Because in the teaching most of the information is in my head but research is all new, so I have to look more'* (Int.No.35/Q.4).

Most of their information needs are always related to research work and the preparation of papers:

> *R: Research.*
> *I: Research in any particular area?*
> *R: I am researching in one particular area in Dentistry. Do you want me to tell you about it?*
> *I: Yes.*
> *R: It's porcelain veneers, porcelain veneers restoration I suppose in cosmetic treatment. ... I need information on research that is being done in the States because they are two years ahead of us using these products. They had these products two years before us. So obviously their clinical studies are more advanced. That's the information that I'm looking for.'*
> (Int.No.32/Q.3-4).

> *'Research ... Because we are working in a new field. We need to back up information. We are working in several new fields and need to find what other researchers have done under certain circumstances'*
> (Int.No.19/Q.3-4).

> *'Research or allied to that information on my specialist subject* [name of speciality] *Basically that's my main interest line so that's what I devote most of my time. Secondly because I am the academic who is meant to know about this particular subject, so if they want an authority opinion on* [name of speciality] *in the dental school then I'm the person to be approached'* (Int.No.27/Q.3-4).

> *'The research side [...] because by its very nature one has to seek out information of pre-existing work'* (Int.No.30/Q.3-4).

Research work demands constant up-dating and tracing of other people's results. Information needs are similar in the case of preparing a paper (for example,

Int.Nos.16;18;21;35;39/Q.1) and again in the case of postgraduate studies (for example, Int.Nos.28;34;35;39/Q.68): identifying references and finding papers related to previous work in whichever speciality they are researching.

Academic staff have identified products, techniques, syndromes, statistics, research findings and administration as the areas where information may be difficult to find.

Commercial products for dental care, dental materials, medication and drugs, all appear on the market supported by as much or as little literature information as the manufacturers decide to release:

> *'It would depend upon circumstances; the most difficult kind are commercial things such as what's in a product, usually dealing with products or medication or drugs. Equipment is easier because they have to comply with Health & Safety regulations, so they have to tell us; when it comes to my own subject again there is a whole wealth of information, not any real problem in finding anything'* [The problem with information about products is to obtain independent opinion, or tests on these products apart from the information supplied by the manufacturers] (Int.No.27/Q.5).

> *'Information about new products. Because we often get materials from the manufacturers without any scientific evidence that it's been tested. We can't find a paper'* (Int.No.34/Q.5).

The lack of printed literature or the difficulty of retrieving it when they perform a literature search is another problem related to clinical techniques, rare syndromes, product information and research:

> *'The most difficult form of information to find in Dentistry is information on clinical techniques. Principally, because they aren't often written up and it has to be acquired via colleagues and information acquired from colleagues it is very often ambiguous'* (Int.No.24/Q.5).

> *'Some of the rare syndromes are not actually in textbooks, not even in the most comprehensive ones'* (Int.No.37/Q.5).

> *'Up-to-date research findings that have not yet been published ... Because they are not published. Researchers will not let you know their results before they have published them'* (Int.No.19/Q.5).

> *'Specific things such as information about a specific material. For example the biocompatibility of a specific material. It is a problem how the publication is indexed. It is necessary to find and to fit one's search in the way the information was indexed in order to extract that information out'* (Int.No.28/Q.5).

> *'That's which is non-specific'* [Looking for one topic, such as a material is very easy, but looking for a widely based topic such as the research project mentioned in question 1 (quantity of clinical work carried out by undergraduates in relation to final examinations) is very difficult. It cuts across many fields] (Int.No.31/Q.5).

*'Research information on specific problems because the fields that I might
be interested on, may well be ... not just be Dentistry and then it's a bit
difficult because you don't know the area concepts well'* (Int.No.35/Q.5).

Physical access to old journal issues, foreign journals, journals not taken by the
University Medical and Dental Library and books out of print has been mentioned as
an occasional problem (Int.Nos.18;33/Q.5).

The common element in all these situations is access to printed literature. The
information-seeking behaviour of academic staff seem to function on the assumption
that information equals printed literature. However, some of them have related in-
formation problems to other factors, for example lack of training as statisticians or
administrators:

*'Because I don't understand the language of Statistics. It's like entering
a whole foreign language, I have to be guided through it. The problem is
that the guides don't speak the dental language'* (Int.No.30/Q.5).

*'It is particularly on the administrative side. I'm not by training an ad-
ministrator. Sources [of information] are more difficult than on the clinical
side'* (Int.No.23/Q.5).

Finally dental education statistics and financial information related to the organi-
zation and running of the dental school are not easy to find; the former because they
are *'very rarely done'* (Int.No.17/Q.5); the latter because of organizational problems
such as who issues the information, who has access to it (Int.Nos.18;25/Q.5).

The main difference between this group and all the previous ones is not so much
the scope of the conditions for their information needs but the fact that the emphasis
is laid on academic activities. The dominance of the latter has influenced the way in
which academic staff perceive information and their information needs. Information
is usually identified with printed literature and information needs are needs satisfied
by using that information source. However, academic staff do implement all the
six strategies used by the other groups; but as we shall see in the next section their
perception of information influences their pattern of information-seeking and therefore
the strategies associated with the use of printed literature, i.e. **Reading** and **Using
the library** are the predominant ones.

9.3   The information-seeking behaviour of academic staff

9.3.1   Basic strategies

Reading

Academic staff implement this strategy to find information related to their aca-
demic tasks: *teaching, research work, postgraduate studies*, and *preparing publications*.
Reading is also a means of keeping up-to-date in their speciality and it is used in the
context of clinical tasks to find information about medical and dental conditions (See
Figure 9.3).
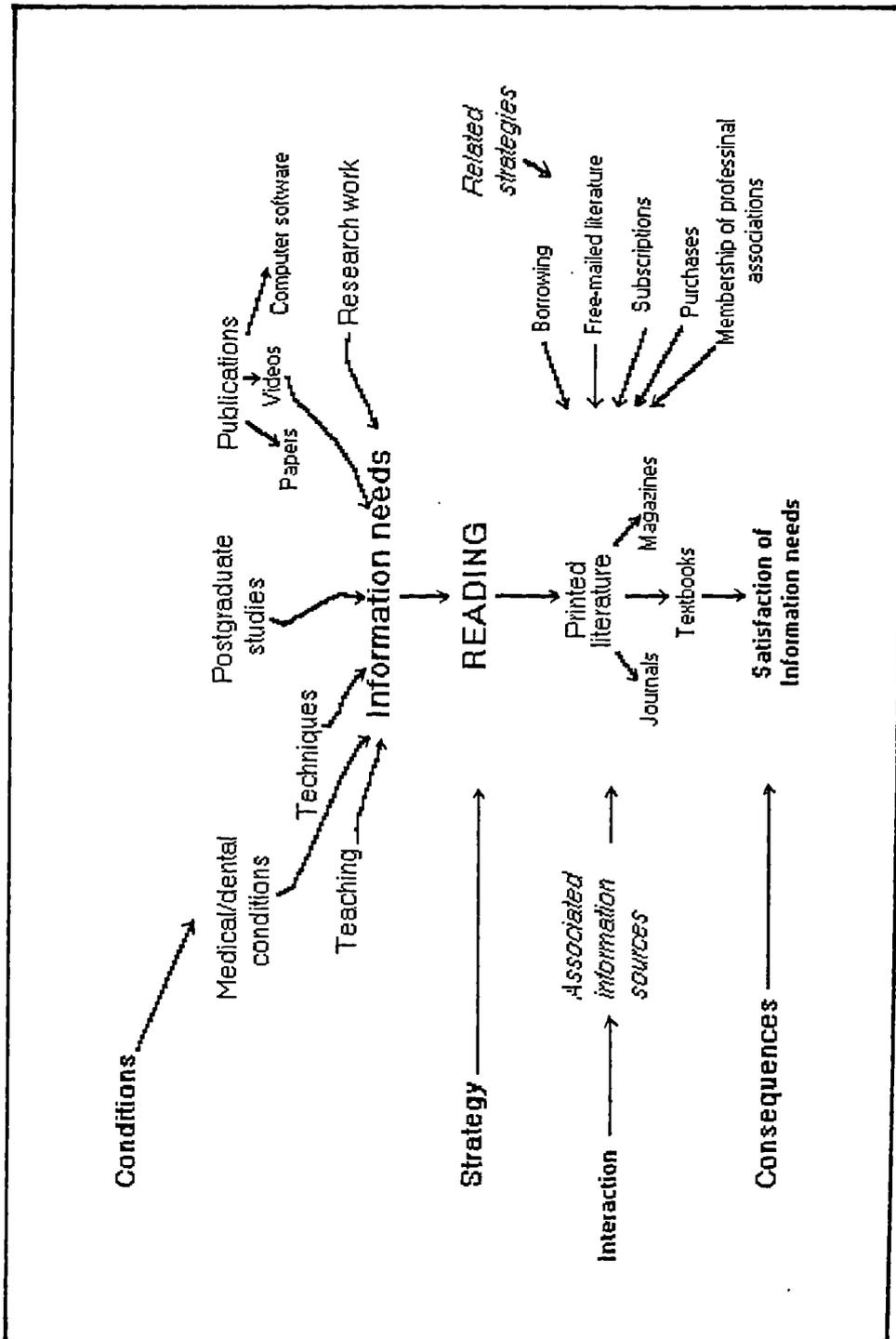
Figure 9.3: Reading as a basic strategy for academic staff

Table 9.6: **Reading by type of document**

Type of document[a]	AS	
	%	()[b]
Journals	100.0	(20)
Textbooks	80.0	(16)
Magazines	30.0	(6)
Other	30.0	(6)

[a]Data from Q.14;22 and 23.
[b]Values in () indicate frequencies.

Table 9.7: **Origin of the literature**

Origin[a]	AS	
	%	()[b]
Membership	100.0	(20)
Borrowing	95.0	(19)
Free-mailed	50.0	(10)
Subscription	30.0	(6)
Purchase	25.0	(5)

[a]Data from Q.14 and 26.
[b]Values in () indicate frequencies.

All of them read journals regularly; most of them (80%) consult textbooks for reference purposes; few of them (30%) read dental magazines or other kinds of documents such as committee reports or manufacturers' literature (See Table 9.6).

Academic staff read primarily the journals they receive with the membership of professional associations, for example *British Dental Journal*, or *British Journal of Orthodontics*. Almost all of them (95%) borrow books and journals from the library, their department at the dental school or another colleague. Again **Reading** becomes closely associated with **Using the library**. Free-mailed literature is less important than for general dental practitioners or community service dentists, only 50% of the academic staff read this kind of literature. As all of them are members of at least one professional association[4] and also all of them are active users of the University Medical and Dental Library[5], personal subscriptions are less necessary and only 30% of them pays subscriptions to journals; for the same reasons only 25% of them buys books (See Table 9.7).

They read regularly journals of their respective specialities: Orthodontics, Oral Pathology, Oral & Maxillo-Facial Surgery, etc. General dental journals like *Dental*

[4]See Table 9.11.
[5]See **Using the library** page 252.

Practice or *Dental Update* are less likely to contain relevant information regarding their specialities or research work. The exception is the *British Dental Journal*, taken by 90% of them. This journal combines general information about the profession and developments in any dental speciality (See Table 9.8).

The usual pattern is reading a general dental journal, i.e. the *British Dental Journal* and at least one journal in their main speciality:

> [The respondent reads the 'British Dental Journal' and the 'British Journal of Orthodontics']: *'to keep up-to-date with research, to get information about techniques, advertisements for courses in the "British Dental Journal" and for information for teaching as well'* (Int.No.35/Q.14.3).

> [They] *provide a lot of information both scientific and up-dating information about clinical practice. They also give information about forthcoming meetings and courses and about items of general interest; jobs as well* [The respondent reads the 'British Dental Journal' and the special issues (research abstracts) of the 'Journal of Dental Research'] (Int.No.33/Q.14.3).

This combination of a general dental journal and a specialized one provides good coverage of new developments in the particular speciality as well as in the rest of the profession; it is a means of keeping in contact with current research and finally it is a valuable source for finding information about courses and jobs (Int.Nos.24-28;30-35;39/Q.14.3).

Reading is implemented by scanning through a journal regularly received:

> *'I wouldn't say I read everything. I certainly look through the titles of all the articles, and read the abstracts of the ones that I think I might be interested in and if I find that I'm more interested I read the article'* (Int.No.18/Q.14.3);

checking a textbook to find information about a particular condition:

> *'... Initially to what I would call bench pathology books: books, textbooks and specialized pathology books that we have in the department as the first source...'* (Int.No.21/Q.1);

or browsing materials sent by post without actually looking for any specific information:

> *'Because they* ["British Dental Journal", "Annals of the Royal College of Surgeons of England" and "British Journal of Oral and Maxillo-Facial Surgery"] *are sent to me and they have interesting information in them'* (Int.No.23/Q.14.3).

As **Reading** is constantly used for keeping up-to-date in their respective specialities, it is the initial strategy whenever they need information related to them:

> [Regarding research work:] *'The information would dictate where I went for the source. For example, something to do with an experimental animal I would go to a standard reference textbook, concepts or ideas down the line of previous publications on the same subject...* [because] *You haven't*

> *got a colleague you can ask because problably the colleague you would ask is yourself because you know more about that particular area, if you don't know what the answer is someone around you probably doesn't either so you tend to go for factual information'* (Int.No.19/Q.9-11).

> [Regarding his speciality:] *'Most up-dated information is published in journals ... I know where to go for it; I know the route, I know which journal I know how to find out where a particular topic is in a particular journal so that's clear to me'* (Int.No.27/Q.11).

Familiarity with printed literature makes **Reading** a preferred initial strategy, but because all academic staff keep personal collections of books, journals and photocopies and have access to departmental bench collections, easiness and speed of access are other factors in making **Reading** an initial strategy (Int.Nos.28;37/Q.9-11).

In some cases **Reading** has been identified as the initial strategy by checking the index of their personal collections:

> *'The first source I would usually prefer would be my own card index file, or simple being able to remember an article or ask a colleague if I couldn't remember about an article. It may vary with the type of information, but I use them regularly in the above order of precedence.* [He prefers his own card index because] *it's the quickest and reasonably reliable; I don't have to go anywhere to use or to consult it'* (Int.No.18/Q.9-11).

> *"Do I have anything on it already?"* [That is his first question] *'If I'd been efficient over the years, I would hope to have at least some information on any subject that might be of interest'* [He keeps an indexed collection of papers that goes back to the beginning of his career 20 years ago] (Int.No.21/Q.9-11).

This variation of **Reading** is possible when personal collections are organized and used in the same way as library collections. Academic staff are the only group where this variation is found because it is the only group where personal collections are fully indexed in some cases.

They all keep personal collections of books, journals, reprints, photocopies and audiovisual materials with levels of organization going from a not very reliable subject file to computer based bibliographic data-bases.

Basic organization is always by type of document: books, journals, papers (articles torn out from journals, reprints, photocopies), slides. Journals are kept in date order, papers are filed by subject following a self-devised classification, while slides are filed by subject or patients' names.

Some interviewees seem confident that they can retrieve whatever they look for just by going through the subject subdivisions or relying on their personal memory without having an index (Int.Nos.17;19;23;30;32;37;39/Q.29.1):

> *R: I keep them* [journals] *in number form, volume, number form.*
> *I: By date.*
> *R: Thank you.*
> *I: Do you have any other kind of materials, like textbooks or photocopies*

of articles?
R: *Yes.*
I: *And do you organize them...?*
R: *Books are just on the shelves, they are not in any particular order because they are more easily identifiable. Papers, any papers or reprints are divided into ... postgraduate teaching, undergraduate teaching, my own research* [She points out to different piles on the desk] *which might be subdivided into porcelain, psychology...*
I: *So a classification of your own.*
R: *It is purely my own piles, at the moment...*
I: *Subject piles?*
R: *Yes, subject piles. I don't keep a card index, which I've always thought I should have done but I don't which is naughty of me I think. But I'm glad to have a very good memory for some strange reason, which helps.*
(Int.No.32/Q.29.1).

Some others acknowledge that certain materials like photocopies are not very well organized (Int.Nos.26;27;28;31;34/Q.29.1):

[The respondent only keeps materials he thinks he is going to refer to in the future. He keeps the journals and regarding the photocopies he comments that they are kept *'in a very disorganized sort of way'*].
(Int.No.26/Q.29.1);

[The respondent keeps journals for about two or three years because of space. After that period he tears out the articles still interesting and throws away the rest. He keeps videos and slides and books, but he replaces books when a new edition appears. Slides are indexed in subject order or by patient's name or patient's number with cross-references and journals are in date order.
But he comments *'everything else is in a mess'*] (Int.28/Q.29.1);

however, they seem unable to improve the situation.
Finally a third subgroup keeps fully indexed collections with manual or computer-based indexes (Int.Nos.16;18;21;22;33;35/Q.29.1):

[The respondent compiles a personal index of the journals that he receives, the current awareness sheets from the University Medical and Dental Library and from a similar service specialized in cancer information. It is a card index, and each card contains: title, author and full details of the journal. It is in subject order using his own subject subdivisions and it goes back to 1980. Prior to that he had a slightly different system that went back to 1962. He used to file the references in numerical order of accession, with separate author and subject indexes; around 1980 he changed to the present system, largely because he could not keep it up-to-date. Both systems are manual ones] (Int.No.18/Q.29.1).

[The respondent keeps journals and books on the shelves]. *'I would go through it and anything that is relevant then I put in the computer, so*

> *I do abstract information to put in my personal computer'* [He puts the bibliographic references in his computer] *'The journals are in chronological order. They aren't, actually you've got to take the whole lot out, but they should be'* (Int.No.35/Q.29.1).

In this group **Reading** may start with a literature search within the personal collection which is extended to the library if more information is necessary. **Reading** and **Using the library** are not only closely related but also they are implemented in similar ways, a seeking behaviour typical of academic staff only.

Each department at the dental school has its own reference collection. Some of them are limited to basic texbooks in the speciality, whilst others include regular subscriptions to several journals. Small collections (less than 20 books) are not indexed; larger collections have subject and author card indexes, kept intermittently. One department has started a data-base making a file of bibliographic references but the interviewee did not give any other details (Int.No.17/Q.30.1). Some departments have an internal lending system to check who has got a particular book or journal issue; others do not allow borrowing, users can only make photocopies. However, the departments tend to lose items. Nobody is in fact in charge of these collections, and none of the collections is large enough to justify a librarian. If some lecturer is asked to organize them and update the catalogues, these tasks are not carried out regularly and consistently because other tasks have higher priorities. However, despite the fact that the size and level of organization varies from department to department, these collections are reasonable accessible to lecturers and professors alike; at least no member of the staff ignores their existence as in the case of hospital staff [6].

Academic staff use **Reading** routinely for seeking information required by their academic tasks. Although this strategy is associated with the use of personal collections of books, journals and photocopies, it is very much linked to **Using the library** not only because the latter may be its complement but also because both of them have the same variation: formal bibliograhic searches using the personal index of their collection or the library catalogues.

Talking

This strategy is implemented by academic staff to seek clinical information about patients, new developments in each speciality, the day to day running of the dental school and closely related to the latter, government policies affecting the future of the NHS and of dental education in the United Kingdom (See Figure 9.4).

When academic staff talk about particular cases with other colleagues, they do it mainly at work and they discuss either the diagnosis, the treatment plan or the overall management of the patients:

> *'The frequent example is cases that we have in the department for diagnosis either good examples, or rare examples or difficult diagnosis to make'* (Int.No.18/Q.17.1).

> *'Clinical cases, treatment... most difficult treatments'* (Int.No.26/Q.17.1).

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[6]See Table 7.10 and page 130.

Table 9.8: Journals and magazines read by academic staff (AS)

Journals and Magazines[a]	AS	
	%	()[b]
American Journal of Orthodontics...	10.0	(2)
The Angle Orthodontics	5.0	(1)
Annals R. College of Surgeons of England	20.0	(4)
BDA News	5.0	(1)
Biomaterials	5.0	(1)
British Dental Journal	90.0	(18)
Br.J. of Oral & Maxillo-Facial Surgery	10.0	(2)
British Journal of Orthodontics	20.0	(4)
British Medical Journal	5.0	(1)
British Society of Dentistry for the Handicapped [Annual report]	5.0	(1)
Community Dental Health	10.0	(2)
Dental Materials	5.0	(1)
Dental Practice	20.0	(4)
Dental Update	25.0	(5)
The Dentist	5.0	(1)
European Journal of Forensic Dentistry	5.0	(1)
European Journal of Orthodontics	15.0	(3)
Histopathology	5.0	(1)
International Endodontic Journal	10.0	(2)
Int. J. of Oral and Maxillo-Facial Implants	10.0	(2)
Int. J. of Oral and Maxillo Facial Surgery	5.0	(1)
Journal of Clinical Orthodontics	10.0	(2)
Journal of Clinical Pathology	10.0	(2)
Journal of Clinical Periodontology	15.0	(3)
Journal of Dental Research	20.0	(4)
Journal of Dentistry	5.0	(1)
Journal of Oral and Maxillo-Facial Surgery	5.0	(1)
Journal of Oral Pathology & Medicine	5.0	(1)
Journal of Oral Rehabilitation	5.0	(1)
Journal of Paediatric Dentistry	15.0	(3)
Journal of Pathology	10.0	(2)
Journal of Prosthetic Dentistry	10.0	(2)
Journal of the American Dental Association	5.0	(1)
Journal of the Royal Society of Medicine	10.0	(2)
The Lancet	5.0	(1)
Newsletter Consultant Orthodontists Group	5.0	(1)
Newsletter International Soc. of Stereology	5.0	(1)
Newsletter Royal College of Pathologists	5.0	(1)
Operative Dentistry	5.0	(1)
Oral Surgery, Oral Medicine, Oral Pathology	5.0	(1)
The Probe	15.0	(3)
Restorative Dentistry	20.0	(4)
Transactions of the Br. Soc. of Radiology	5.0	(1)

[a]Data from Q.14;22 and 23.
[b]Values in () indicate frequencies.
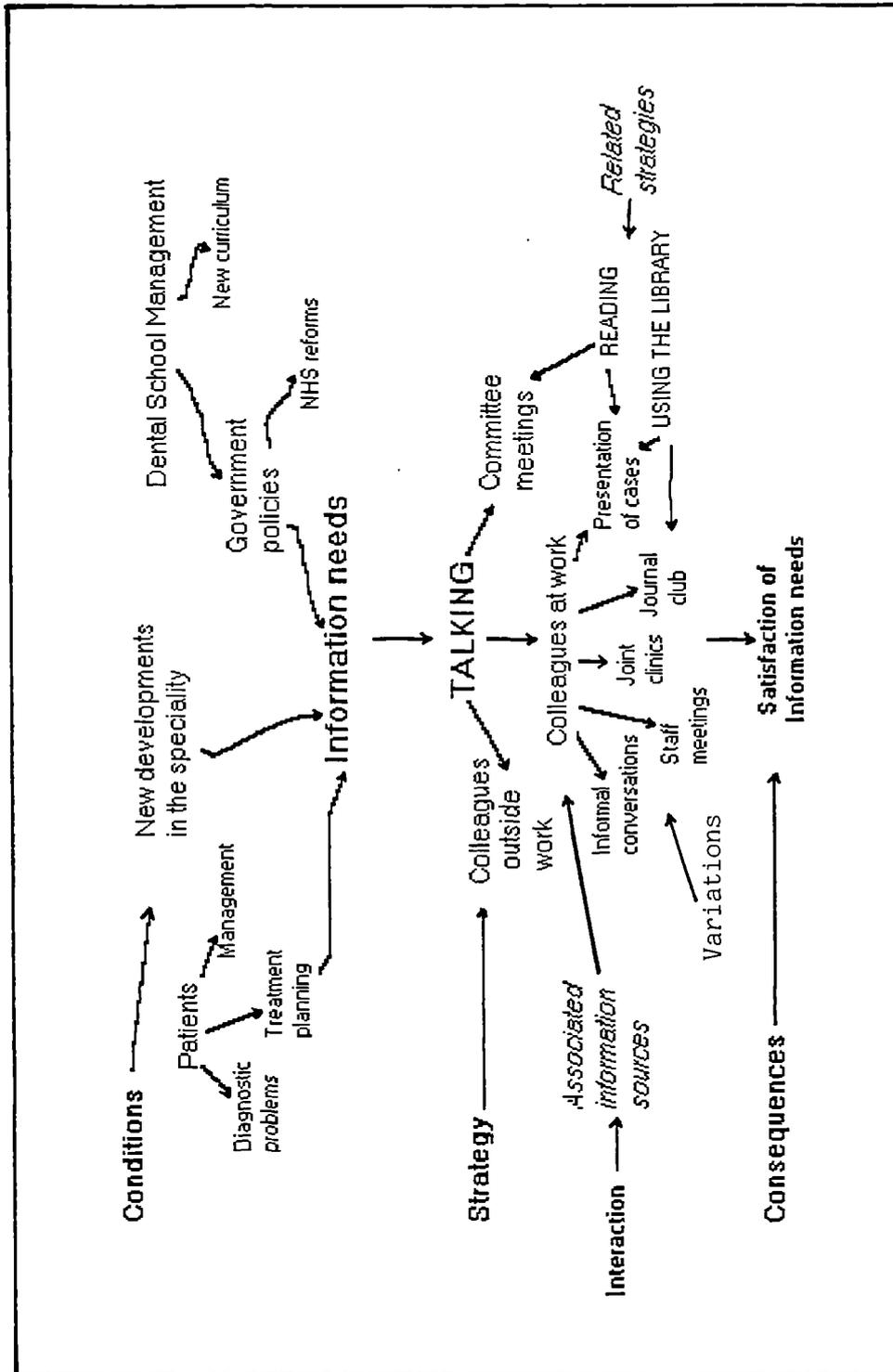
Figure 9.4: Talking as a basic strategy for academic staff

> *'If there was some doubts about the management of the patient then I would get advice, a second opinion. Also if it was something particularly interesting I would often tell my colleagues, something unusual'* (Int.No.27/Q.17.1).

> *'Asking advice about treatment, use of materials, patient management, techniques used, possible referrals'* (Int.No.31/Q.17.1).

It is part of their daily routine to talk about new developments in their specialities as well as in other fields (Int.Nos.16-39/Q.18.1). As in the case of patient-related information, they are seeking advice and opinion from another colleague.

Talking appears again in the context of school and hospital administrative matters, for example, at the time of the interviews, the new dental curriculum[7] was their main topic of conversation, along with remuneration, manpower requirements and government reforms of the NHS (Int.Nos.16-39/Q.19.1).

There are formal and informal patterns of interaction for the three instances in which **Talking** is used: patients, new developments, administration and policies affecting the dental school. These patterns are similar to those of hospital staff since both groups interact together in most cases.

The informal patterns of interaction are unplanned, spontaneous conversations that may happen during the clinic, at coffee break or lunch time:

> *'Usually informal over coffee or in the clinic with your own patient or a student patient'* (Int.No.31/Q.17.3).

> *'It's an on-going thing really, when we tend to meet, we tend to talk ... It's continually'* (Int.No.39/Q.18.2).

> *'By sharing the same office with a colleague. Whenever it comes up in conversation in the common room'* (Int.No.33/Q.18.3).

Regarding dental school administration and dental politics, the replies describe several informal patterns. The conversations are i) informal as in the examples above, i.e. with colleagues at work (Int.Nos.16;17;18;19;21;24;25;26;28;30;34;37;39/Q.19.1); ii) informal at conferences and social meetings, i.e. with colleagues outside work (Int.Nos.28;30;31;33/Q.19.1); iii) infrequent because the interviewee does not like to get involved in this sort of issues (Int.No.35/Q.19.1).

The formal patterns of interaction are joint clinics, case presentations, staff meetings, journal clubs and committee meetings. Joint clinics seem to be less formal and less frequent than in the case of hospital staff[8] and community service dentists:

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[7] As a consequence of the recommendations by the Dental Review Working Party to the University Grants Committee in 1988, the dental course was extended to 5 years, which meant an increase of 2 terms in the pre-clinical studies; because of that and other recommendations regarding the contents of the dental course especially at the pre-clinical level, in 1989 the dental schools were reviewing the overall structure of the dental curriculum (UNIVERSITY GRANTS COMMITTEE. DENTAL REVIEW WORKING PARTY, 1988).

[8] Three members of the staff who refused to take part in the study were oral surgeons; oral surgery is one of the predominant specialities within hospital staff and one that uses this form of interaction routinely. In addition academic staff have less clinical commitments than their colleagues at the hospital.

'Informally. No formal structure. Sometimes I deliberately organize a patient to attend and having another colleague to look at the same time. A joint appointment' (Int.No.37/Q.17.3).

Presentation of cases are important for teaching postgraduate students and there are several events of this sort run by different departments in the dental school. In some cases it is a 'case study day' organized by one department for its staff and postgraduate students when everybody presents cases and they are discussed by the group (Int.Nos.26;35/Q.17).

They may have clinical meetings to discuss the selection of patients and treatment progress as in the 'Implant clinic'; these meetings are for staff only both from the school and the hospital (Int.Nos.16;23/Q.17.1).

There are joint events by two different departments including academic staff, postgraduate students and hospital staff. For example, the *clinical pathological conference* where oral pathologists and oral surgeons from the dental school discuss cases with the clinicians from the dental hospital; this conference is held every week during term time and it is part of the formal training of postgraduate students in the departments of Oral Pathology and Oral and Maxillo-Facial Surgery (Int.Nos.18;21;22;23/Q.17).

Another variation is inter-school meetings. The Department of Oral Patholgy holds meetings with its fellow departments from the dental schools in Leeds, Manchester and Liverpool once a term as part of their own continuing education. These meetings are again for staff and postgraduate students (Int.No.21/Q.17.3). Also some associations include in the programme of their annual conferences case study sessions, for example the British Society for Oral Pathology has a session during its annual conference dedicated to diagnostic cases; it is a national forum that gathers experts from all over the country (Int.No.21/Q.17.3) and its main objective is to discuss cases that may contribute to make better diagnosis.

Staff meetings are held to discuss new developments in the profession (Int.Nos.16; 21;24;26;32;33;34;35/Q.18):

'We have every term, for instance, what is called "Staff Development Programme" in the department, it is either new developments or matters related to teaching' (Int.No.26/Q.18.2).

'Formal meetings for new developments and other professional issues. We have in our department, we have postgraduate... loosely called the postgraduate training session and that works as continuing training for ourselves within the department on Wednesday afternoon, we have a couple a term and these sort of things might well come up in that training session' (Int.No.32/Q.18.3).

'Usually informally ... unless someone who has been on a course, then we organize a formal day, just to talk about it' (Int.No.35/Q.18.3).

Every department has a different pattern of meetings: formal staff meetings, regular weekly sessions, ad-hoc meetings; but unlike clinical discussions, these meetings are not well established events in the daily routine of academic staff, only eight interviewees have mentioned them and the rest (12) have only mentioned informal conversations to find out about new developments.

Journal clubs are another formal pattern of interaction. They are used to find information about new developments. This variation of **Talking** is not as important for academic staff as it is for hospital staff and postgraduate students; only two interviewees mentioned the journal clubs of their respective departments (Int.Nos.23;25/Q. 18.3).

Committee meetings are the formal pattern of interaction to discuss administrative and political issues. Lecturers and professors alike sit on several committees at school, hospital, faculty and university levels (Int.Nos.16-39/Q.19.3). In these instances **Talking** is related to **Reading** because the information sought, exchanged and produced at these meetings becomes part of a written document (a report, the minutes, etc.) which becomes in turn an information source for the next meeting.

Talking is selected as an initial strategy in the context of clinical information about patients or in situations when academic staff cannot identify an adequate document source (Int.Nos.17;19;23;25;26;27;30;33/Q.9-11):

> 'Because I deal in a whole series of disciplines, because we teach students here to do dental practice. There are two areas: first, work in which I am personally involved for research. I keep myself up-dated with the literature, the searches and so on. The second: it is work in which I am not specifically involved so my first approach is to the specialist in that area' (Int.No.17/Q.11).

> [Talking to a colleague regarding patients treatment is perceived as:] 'It's quicker and if the colleague knows it he has probably tried it and if the has tried from his own knowledge that is the best information of all' (Int.No.19/Q.11).

> 'Well it would depend on the subject area, it would be divided between asking colleagues or using the library. Asking colleagues when it is something that is non-clinical ... because I possibly wouldn't know how to find out the information that I want' [Using the library would be the initial strategy for clinical information] (Int.No.26/Q.9-11).

> [Regarding patient care the first source would always be colleagues:] 'it is mainly because there is no systematic information base except what's in the experience and knowledge of colleagues. There isn't a library where I can go that tells me how to treat a patient, how to manage a patient' (Int.No.27/Q.9-11).

Academic staff select **Talking** whenever **Reading** and **Using the library** cannot provide the answer to their information needs, either because that answer is not in document form, for example the opinion of a colleague about a particular case or because they do not know how to find the information in the literature, for example, when they need information outside their speciality.

Enquiring

Academic staff implement this strategy to satisfy information needs originated by clinical, administrative, research and teaching tasks. In each case they deal with different groups of individuals from other occupations or professions.

Academic staff enquire of medical doctors and other health professionals, information to complete clinical histories, to decide diagnosis of specific cases, or to make treatment decisions. Drug information may be part of the latter. They contact general practitioners, hospital doctors, dermatologists, pathologists, oncologists, paediatritians, dietitians or physiotherapists. If they have to deal with child abuse cases, accidents, insurance claims or criminal cases, they may seek information from police officers, forensic pathologists, organizations such as the *National Society for the Prevention of Cruelty to Children* and social workers. The latter are also able to provide information about the social and family background of patients in general but more frequently about children, elderly and handicapped patients (See Figure 9.5).

Regarding hospital and dental school management, academic staff need information on hospital and school administration, building maintenance (the new building for the dental school as well), purchase and maintenance of equipment, dental products, finances and budget information. This is all requested from NHS administrators, other academics and university staff, architects, equipment engineers and manufacturers, dental manufacturers and accountants (See Figure 9.6).

Enquiring is also implemented to obtain research-related information. Research projects may require information on topics from other disciplines: Materials' Science, Statistics, Information Technology, Mechanical Engineering, Anatomy or Psychology. Product, grants, funding and equipment information may also be needed. Academic staff seek that information from experts in other disciplines and organizations such as the dental industries, the Medical Research Council, the University Funding Council or the British Standards Institution.

Even teaching and preparing publications rely on this strategy. For example enquiries to school teachers about the organization of visits as part of training undergraduate dental students in Children's Dentistry (Int.No.37/Q.20) or enquiries to media and computers experts in relation to video production and software development (Int.Nos.16;17;23;24;33/Q.79;81) (See Figure 9.7).

All these enquiries are made over the telephone, by letter, in person or combining two ways, for example a meeting previously arranged on the telephone or by letter. No variation is more preferred than others (Int.Nos.16-39/Q.20.3); enquiries are made in whatever way seems to be more efficient for each particular instance:

> 'Every way you could imagine, formal meetings, informal meetings [in person; over the telephone], writing. Whichever method is most appropriate at the time (Int.No.25/Q.20.3).

Academic staff, like other groups of dental professionals, prefer individuals as their main information source for Enquiring: *the patient's doctor, a university colleague,* etc.; all the academic staff acquire information in that way. However, 40% of them addresses some of their enquiries to organizations outside the field of Dentistry (See Figure 9.8). This percentage is much higher than for any other group in the study (See Figures 6.7, 7.7, 8.7 and 10.7). The main reason for this difference is that academic staff extend the use of Enquiring to research activities, whilst the others tend to use it only for clinical or administrative information, because they need mainly to identify the individual who is dealing with the medical side of a patient or the expert that can solve a particular problem with treatment, equipment or services. Contacts with individuals is faster and suit clinicians' patterns of work. Research projects need time to get organized and carried out, in that context approaching organizations is

not only necessary but compatible with the schedule of research programmes that are supposed to last months if not years. Clinicians need to make decisions here and now; researchers can wait for an answer.

Again academic staff make more use of dental related information services than the other groups of dental professionals (See Figures 9.9, 6.8, 7.8, 8.8 and 10.8). However, that use is not high in real terms, only 15% have contacted the Federation Dentaire Internationale, 60% the Local Health Authority, 35% the District Drug Information Centre and 10% the Regional Drug Information Centre, at least once.

Enquiring has never been associated with patients as an information source. In all the previous groups this strategy is implemented in two stages for details of clinical histories[9], first as a dialogue with the patient or parents and then, if it is necessary, further enquiries are made from other professionals. Academic staff have never mentioned the first stage. Once again their perception of information in terms of printed literature is related to that. Their information-seeking behaviour is so dependent on **Reading** and **Using the library** that they find very difficult to describe other instances of information-seeking and actually to perceive these instances as information-seeking events.

Attending/organizing continuing education events

Academic staff attend as well as organize and conduct continuing education events such as postgraduate courses and conferences. Because they are involved with those three aspects of continuing education, they have found difficult to distinguish between attending, organizing and conducting. Sometimes they are only attendees, sometimes they organize the events but some other times they take part both as a lecturer and as an attendee.

Regardless of their role in continuing education events, this strategy is always implemented by academic staff in the context of keeping up-to-date in their respective specialities (See Figure 9.10). **Attending/organizing...** has never been mentioned in relationship with any other conditions.

The majority of the academic staff attends courses at least twice a year and all of them attend conferences regularly (See Table 9.9). The reasons for not attending courses are cost:

'They [courses] are generally too expensive' (Int.No.34/Q.15.4);

lack of courses related to their subject interests:

'There aren't any that relates specifically to what I want, too busy doing courses for other people' (Int.No.37/Q.15.4);

or because other strategies such as **Talking** and **Reading** are preferred:

'Not any more, I used to when I was in practice. I am keeping up-to-date all the time ... with staff interaction, staff meetings and teaching' (Int.No.39/Q.15.4).

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[9]See Figures 6.5, 7.5 and 8.5.
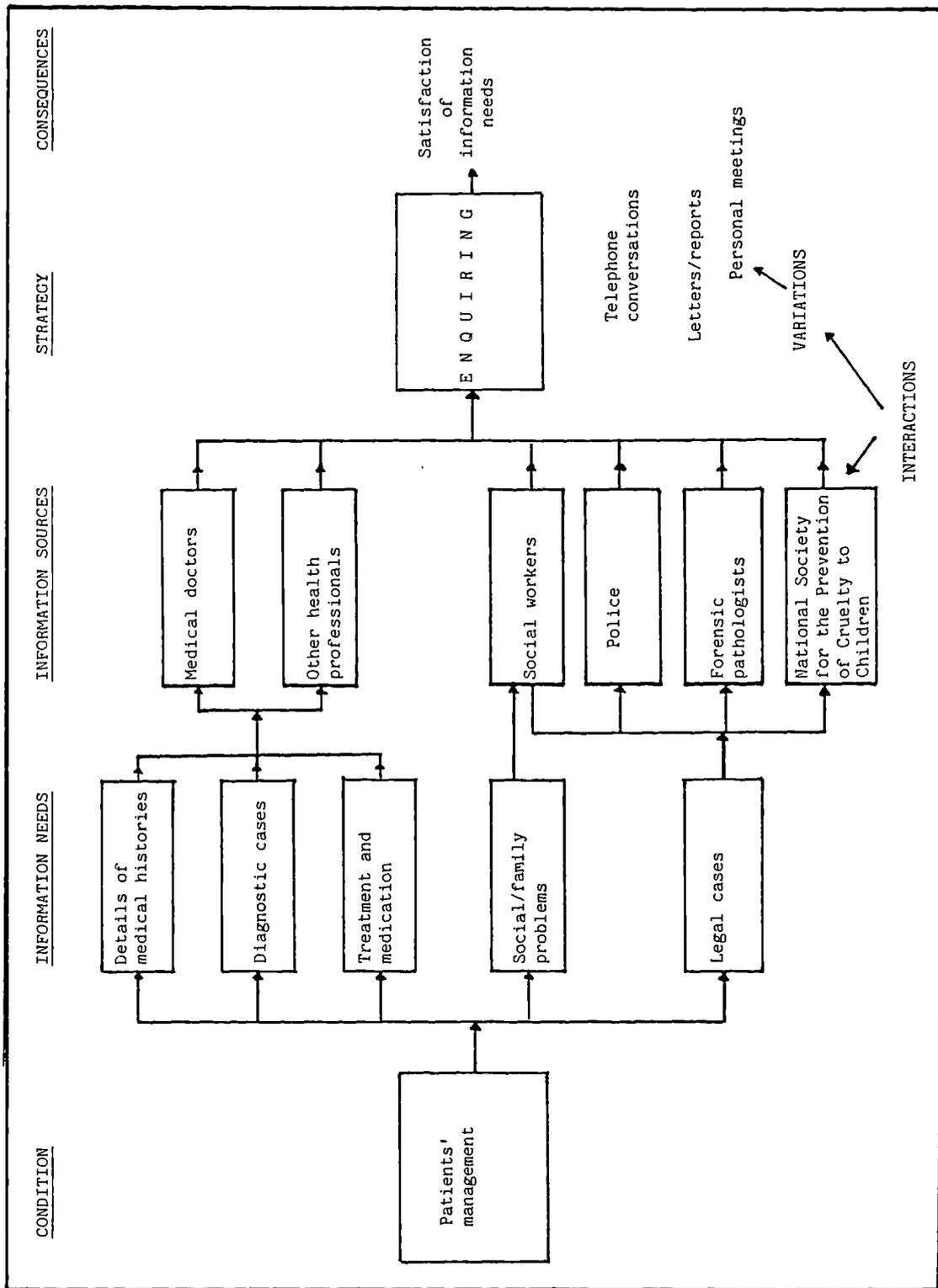
Figure 9.5: **Enquiring as a basic strategy to seek patients' information -** Academic staff
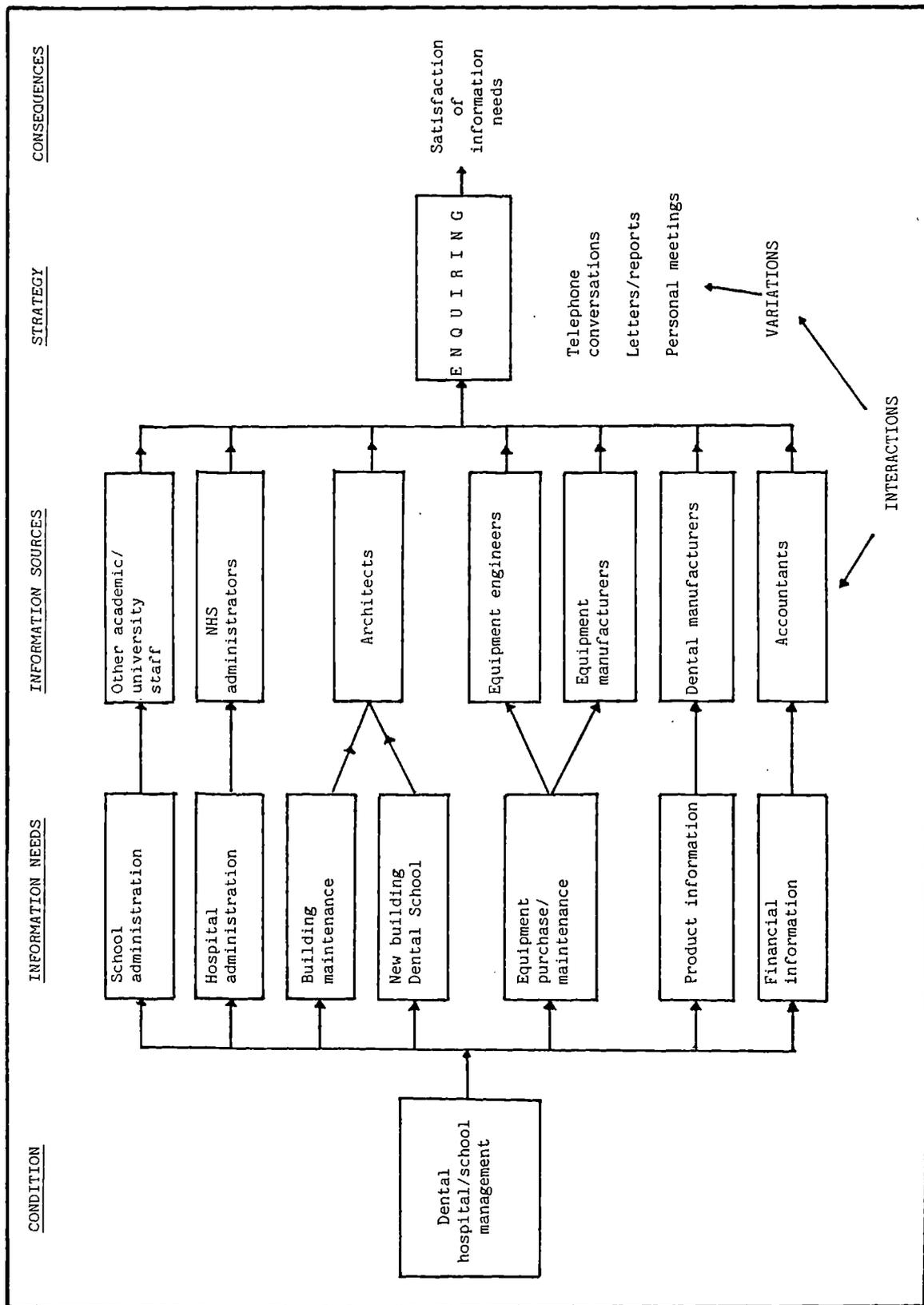
Figure 9.6: Enquiring as a basic strategy to seek management information - Academic staff
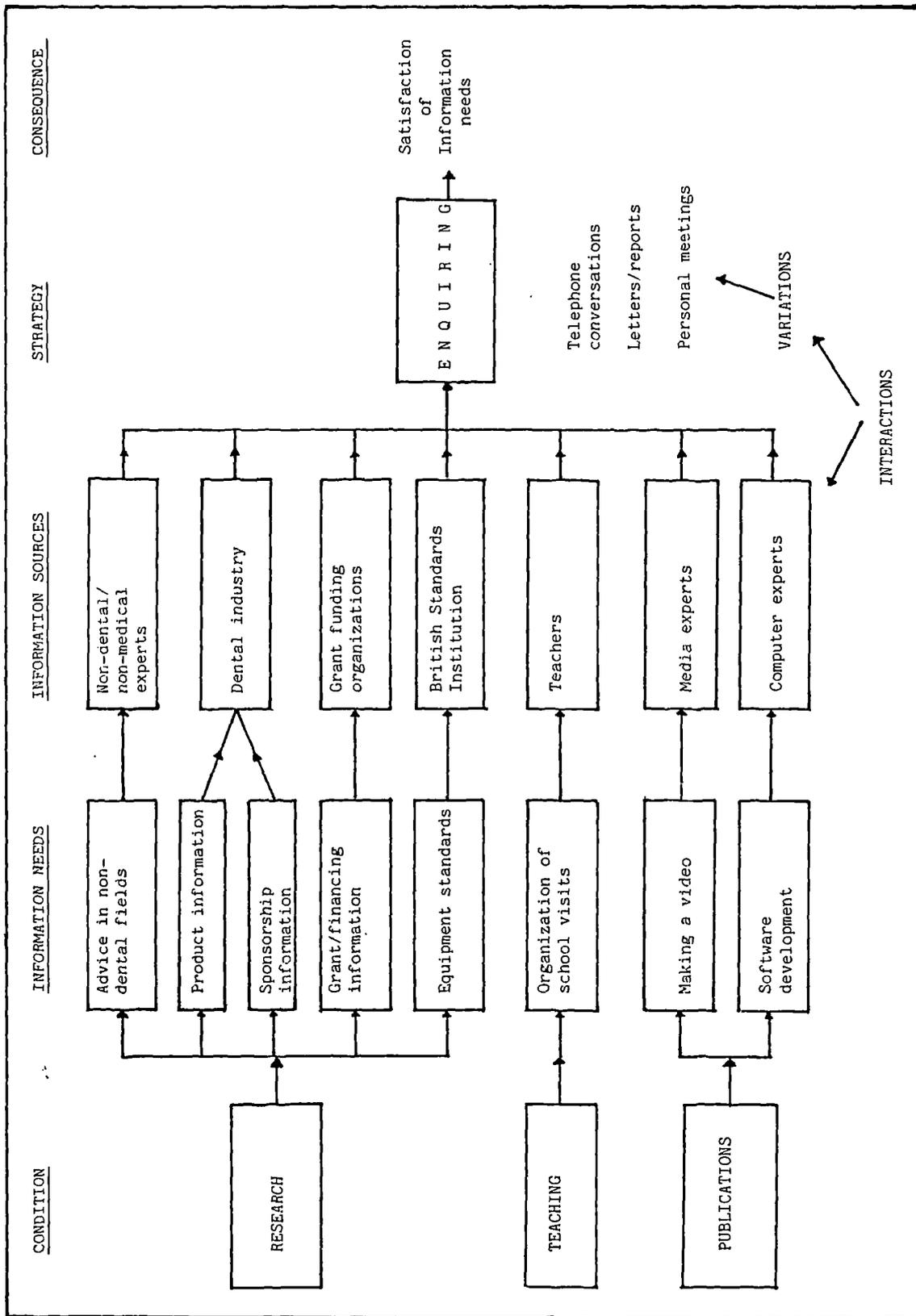
Figure 9.7: **Enquiring as a basic strategy to seek information related to** **academic tasks - Academic staff**
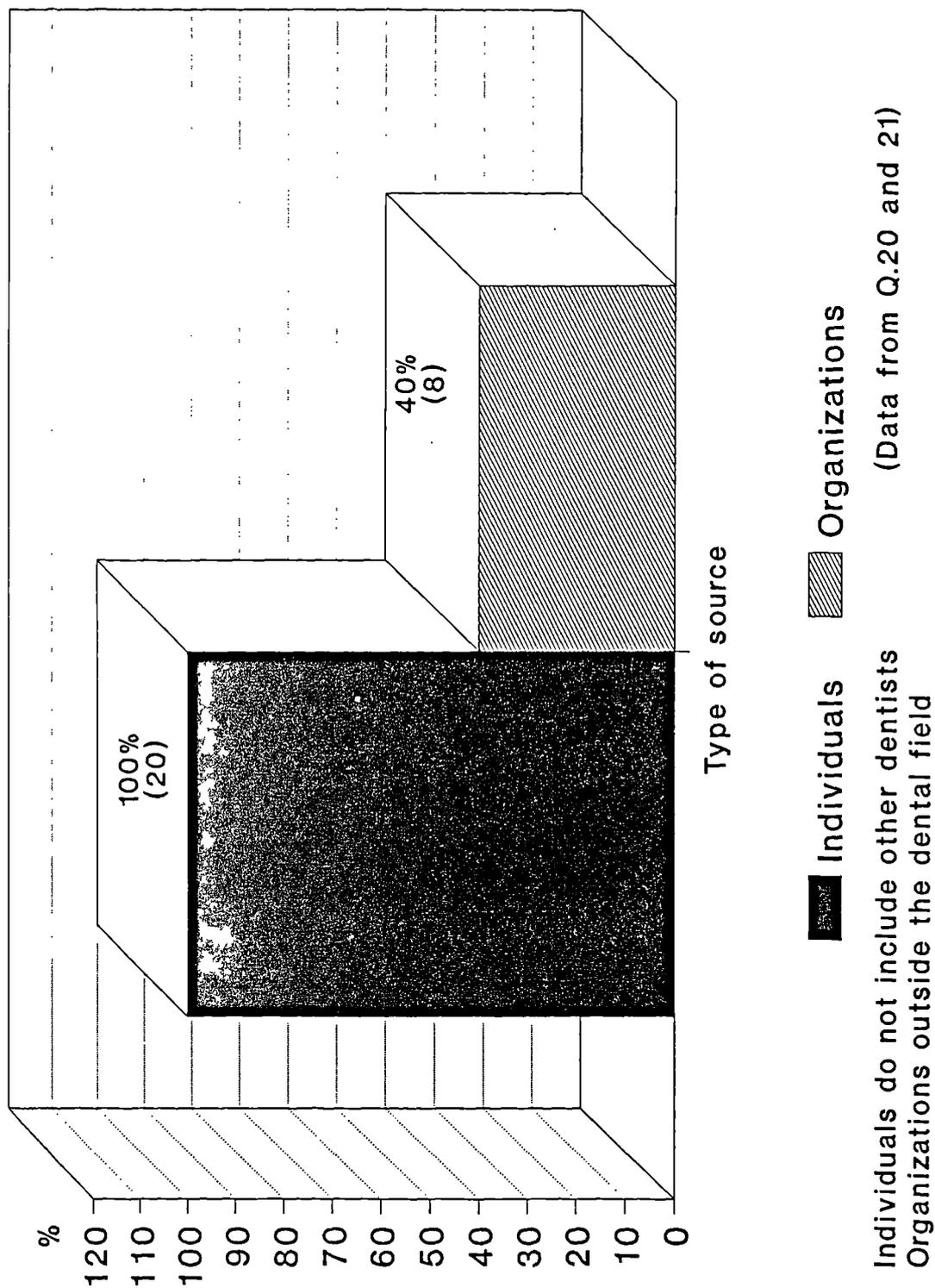
Figure 9.8: Information sources for Enquiring - Academic staff
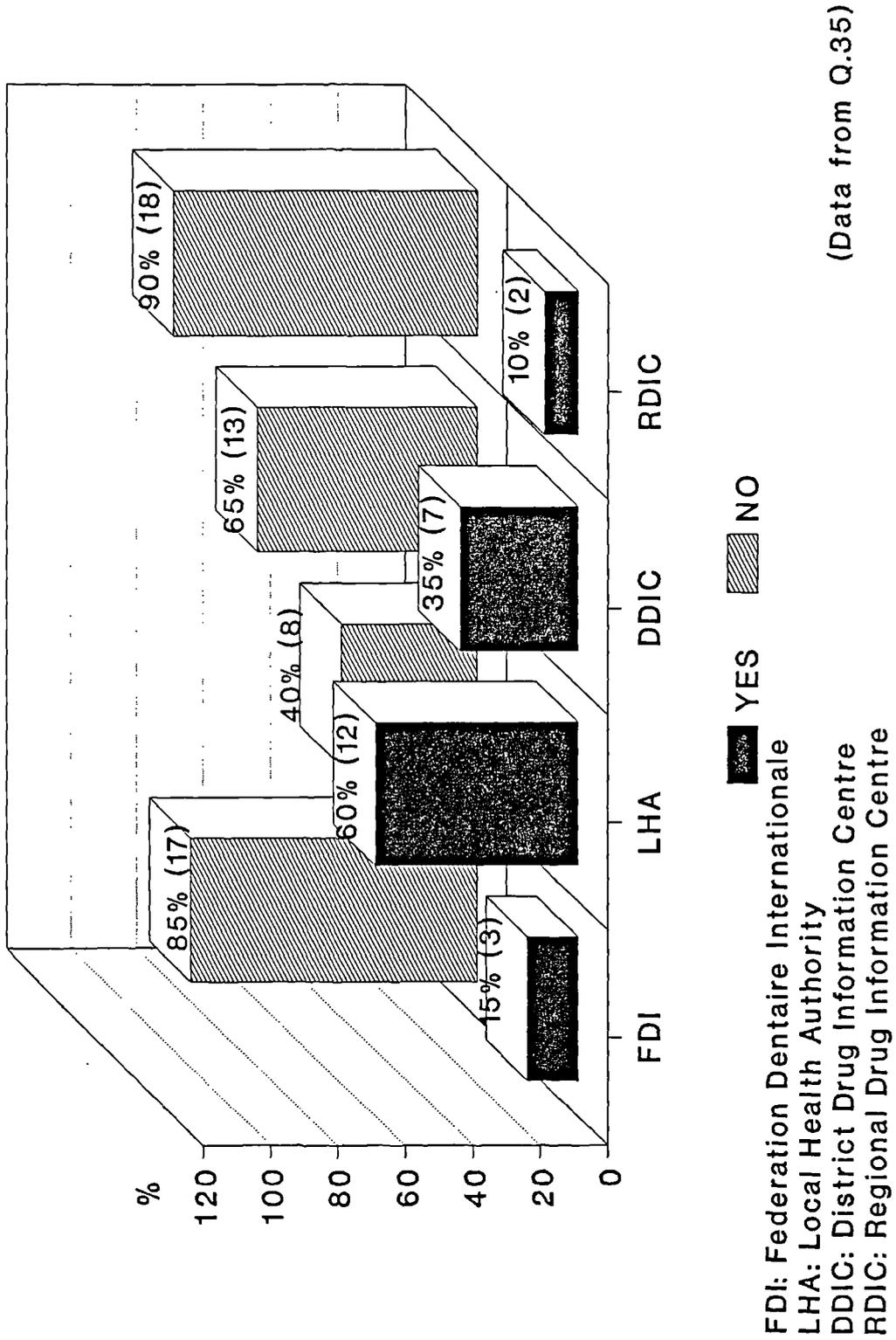
Figure 9.9: Use of information services by academic staff
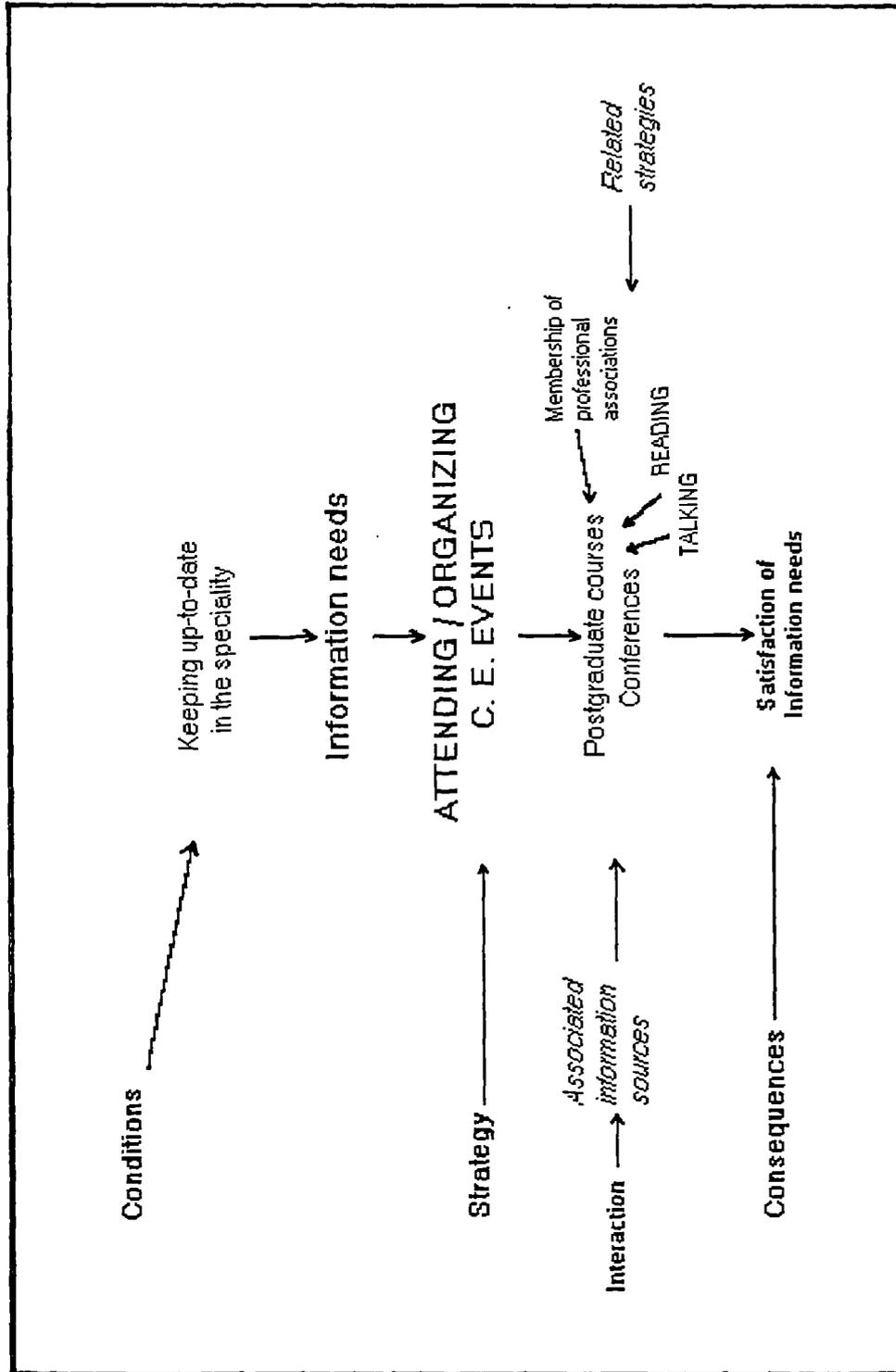
Figure 9.10: Attending/organizing continuing education events as a basic strategy for academic staff

Table 9.9: **Frequency of attendance at continuing education events**

Event[a]	Non-attendance		Irregular attendance[b]		Regular attendance[c]		Intensive attendance[d]	
	%	()[e]	%	()	%	()	%	()
Courses	15.0	(3)	10.0	(2)	45.0	(9)	30.0	(6)
Conferences	0.0	(0)	5.0	(1)	20.0	(4)	75.0	(15)

[a]Data from Q.15 and 16.
[b]No specific frequency or less than once a year.
[c]At least once or twice a year.
[d]More than twice a year.
[e]Values in () indicate frequencies.

Table 9.10: **Willingness of academic staff to travel**

Event[a]	Sheffield[b]		Region[c]		U.K.[d]	
	%	()[e]	%	()	%	()
Courses	5.9	(1)	5.9	(1)	88.2	(15)
Conferences	0.0	(0)	0.0	(0)	100.0	(20)

[a]Data from Q.15.2 and 16.2.
[b]Attendance at local events only.
[c]Attendance at events in the Trent Region and the North of England,
including Glasgow and Edinburgh.
[d]Attendance at events anywhere in the United Kingdom.
[e]Values in () indicate frequencies.

On the other hand the only reason for irregular attendance at conferences is job commitments that would not allow an absence of several days (Int.No.23/Q.16.1).

Despite all these reasons: costs, lack of suitable courses, preference for other strategies or time, academic staff do not have serious obstacles to implement this strategy and they attend courses and conferences more frequently than their colleagues in general practice, dental hospital or community dental service (See Table 6.11, Table 7.11 and Table 8.13).

The majority of those who attend courses and conferences do so anywhere in the United Kingdom and academic staff do not prefer local or regional venues exclusively (See Table 9.10).

Attending/organizing... is related to membership of professional associations and to **Talking and Reading** (See Figure 9.10). As in the case of their colleagues at the dental hospital, the majority of the academic staff has joined the *British Dental Assocation* and all of them are members of at least one association in their particular speciality. As a result the range of special associations represents the whole spectrum of specialities in the dental school, each one having a small number of associates which is related to the number of specialists in each area[10]. The only other associations that

[10]See Table 9.5.

cover all subject interests but from the research point of view are the *British Society for Dental Research* and its international counterpart the *International Association for Dental Research*; because of that they are the two associations that follow the *British Dental Association* in number of associates among the academic staff (See Table 9.11).

The main reasons for joining all these associations are subscribing to their journals and attending their meetings (Int.Nos.16-39/Q.13):

> '*Apart from their regular publications which are useful obviously for keeping up-to-date I don't generally avail myself of anything else. I don't use their libraries. I enjoy their conferences*' [The respondent is a member of the 'British Dental Association', 'British Society of Restorative Dentistry', 'British Society for the Study of Prosthetic Dentistry' and 'British Endodontics Society'] (Int.No.39/Q.13).

Academic staff find out about meetings and conferences in the journals that these associations publish, in that way **Attending/organizing ...** is related to another basic strategy: **Reading.**

Conferences, meetings, evening lectures, all these events provide an opportunity to meet other colleagues working in the same field (Int.Nos.24;26;32/Q.13):

> '*The services that they provide is giving conferences, and the information you get from colleagues there*' [The respondent is referring to the 'British Society for Dental Research', and when he refers to the 'British Society for the Study of Prosthetic Dentistry' he adds:] '*the conferences are sometimes interesting, again it is really the information you get from colleagues*' (Int.No.24/Q.13).

Attending/organizing... is perceived as a complement to **Talking**; they obviously obtain information from the events themselves, i.e. the formal presentations but apart from that they seek information about developments in the speciality by talking informally to other colleagues attending the same event.

Attending/organizing... has never been identified as an initial strategy. Moreover when academic staff described their patterns of information-seeking, this strategy was mentioned neither alone –which is understandable because it can only satisfy long-term information needs– nor in combination with other basic strategies. **Attending/organizing...** is a background strategy for academic staff, in the actual day-to-day information-seeking **Reading, Talking** and **Using the library** are the main strategies.

Watching

This strategy is associated with the use of audiovisual materials, but academic staff have defined them in a wider sense than other groups in the study. While general dental practitioners, hospital staff and community service dentists perceive audiovisual materials as videos and slides, academic staff have defined a wider range that goes from the use of traditional blackboard and chalk to a museum collection[11], and includes personal demonstrations of techniques.

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[11]The Department of Oral Pathology has a collection of specimens for teaching purposes.

Table 9.11: Membership of professional associations

Associations[a]	AS	
	%	()[b]
Association of Clinical Pathologists	10.0	(2)
British Association for the Study of Community Dentistry	10.0	(2)
British Association of Oral and Maxillo-Facial Surgeons	10.0	(2)
British Association of Orthodontists	5.0	(1)
British Dental Association	90.0	(18)
British Endodontic Society	10.0	(2)
British Paedodontic Society	25.0	(5)
British Society for Dental Research	40.0	(8)
British Society for Dental Research-Implantology Group	5.0	(1)
British Society for Restorative Dentistry	20.0	(4)
British Society for the Study of Orthodontics	20.0	(4)
British Society of Dentistry for the Handicapped	5.0	(1)
British Society of Periodontology	15.0	(3)
British Society of Radiology	5.0	(1)
Consultant Orthodontists Group	5.0	(1)
Consultants in Restorative Dentistry	10.0	(2)
European Orthodontic Society	5.0	(1)
European Society for Forensic Dentistry	5.0	(1)
Fluoridation Society Limited	5.0	(1)
International Academy of Pathology-British Division	5.0	(1)
Int. Association for Dental Research	30.0	(6)
Int. Association of Oral Pathologists	10.0	(2)
International Society of Stereology	5.0	(1)
Pathological Society of Great Britain and Ireland	15.0	(3)
Royal Society of Medicine	10.0	(2)
Sheffield Orthodontic Study Circle	15.0	(3)
South Yorkshire Paedodontic Society	5.0	(1)

[a]Data from Q.12.
[b]Values in () indicate frequencies.

There is a 100% use of audiovisual materials by academic staff; almost all of them use (95%) slides, 75% use videos and 60% use overhead projections (See Figure 9.11). Despite a high use of videos, academic staff prefer slides, which are used to support oral presentations or in tape-slide sequences as self-teaching aids. Some of the reasons for this preference are that a video needs to be watched throughout, it cannot be altered, adapted or updated unless a new one is produced; while slides are easily changed, reorganized in different sequences and the projection can be stopped at any point for adding comments (Int.Nos.25;31/Q.27).

On the whole academic staff make their own slides and self-produce most of the other audiovisual materials, including videos since the dental school is actively involved in the production of dental videos with the co-operation of Sheffield University Television (Int.Nos.16-39/Q.27.2).

But do academic staff perceive **Watching** as a strategy for seeking information? The answer to that question is certainly not. The 100% use of audiovisual materials refers to teaching. Academic staff produce and transfer information in audiovisual form but they do not seem to actually seek information by using these types of information sources. As they associate the use of audiovisual materials with teaching, they find difficult to distinguish other instances of their use. Only two interviewees have done so; one interviewee has mentioned videos as a means of keeping up-to-date (Int.No.30/Q.27.1) and another one has indicated the use of videos both for teaching and learning (Int.No.28/Q.27.1). Apart from them, the rest of the interviewees has consistently refer to audiovisual materials in the context of teaching.

They obvioulsy seek information by means of **Watching** when they select the slides for a lecture or when they examine x-rays of a patient, but these instances have not been identified as information-seeking activities by academic staff. The only exception has been one interviewee who works part-time in a general dental practice and he has mentioned watching videos as one way of seeking information (Int.No.33/Q.1). General dental practices receive videos on new techniques, which are produced to keep dentists up-to-date, while dental schools are more involved in the production of videos for teaching purposes. Academic staff have not described Watching as an active and conscious information-seeking strategy.

Using the library

This strategy stands at the centre of the information-seeking behaviour of academic staff. This group of dental professionals shows a 100% use of libraries. All the interviewees are 'active members' of the University Medical and Dental Library[12], 95% use the British Dental Association Library, 55% use the Main University Library and other library branches at Sheffield University and 25% use other libraries like for example the Royal Society of Medicine Library, Sheffield City Libraries, etc. (See Figure 9.12). The overall use of libraries by academic staff is higher than that of general dental practitioners, hospital staff and community service dentists (See Figures 6.12 and 6.13; Figures 7.12 and 7.13; Figures 8.12 and 8.13).

Academic staff may use the library to carry out formal literature searches for a research project or a paper:

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[12]'Active members' are those with a currently valid library ticket.
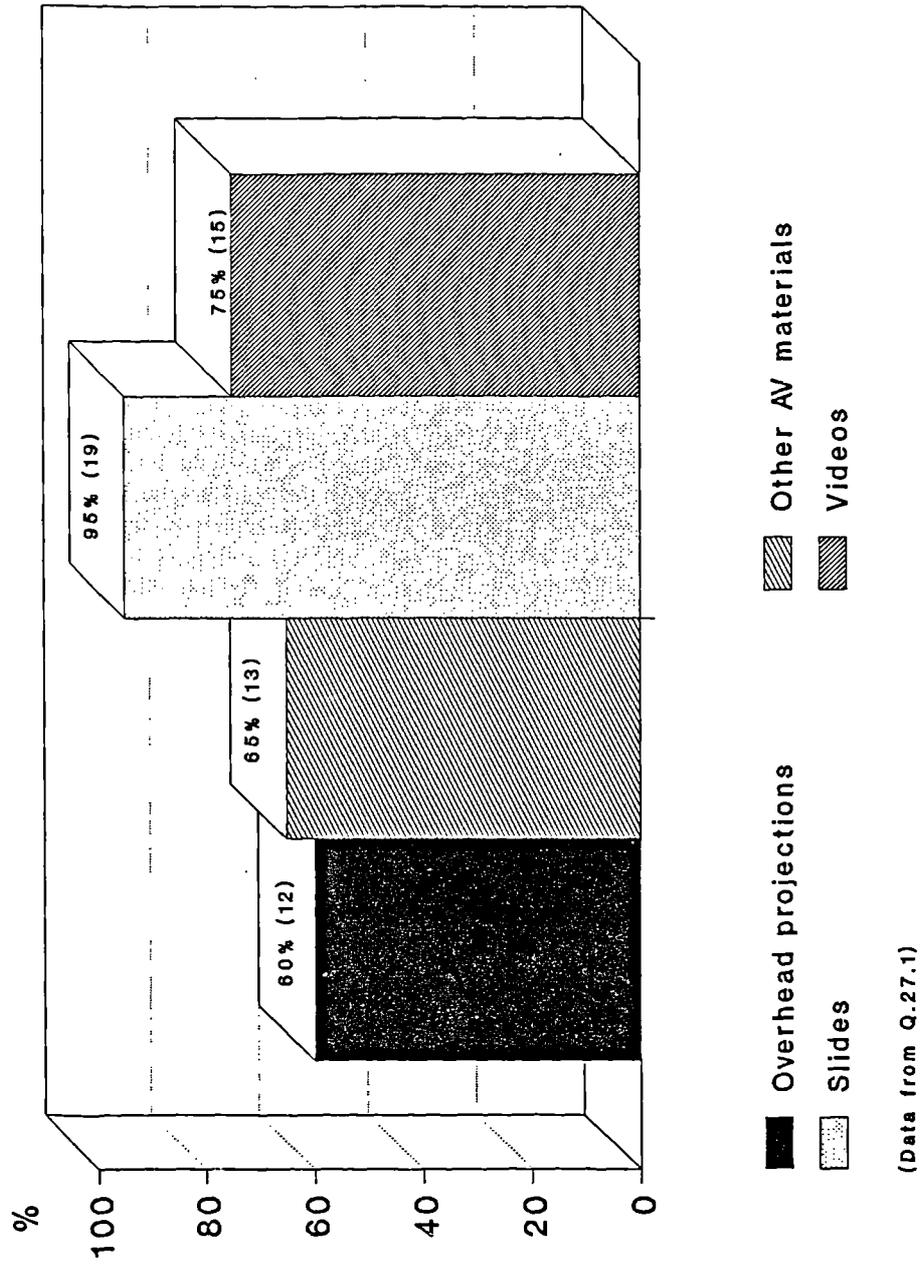
Figure 9.11: **Types of audiovisual materials used by academic staff**
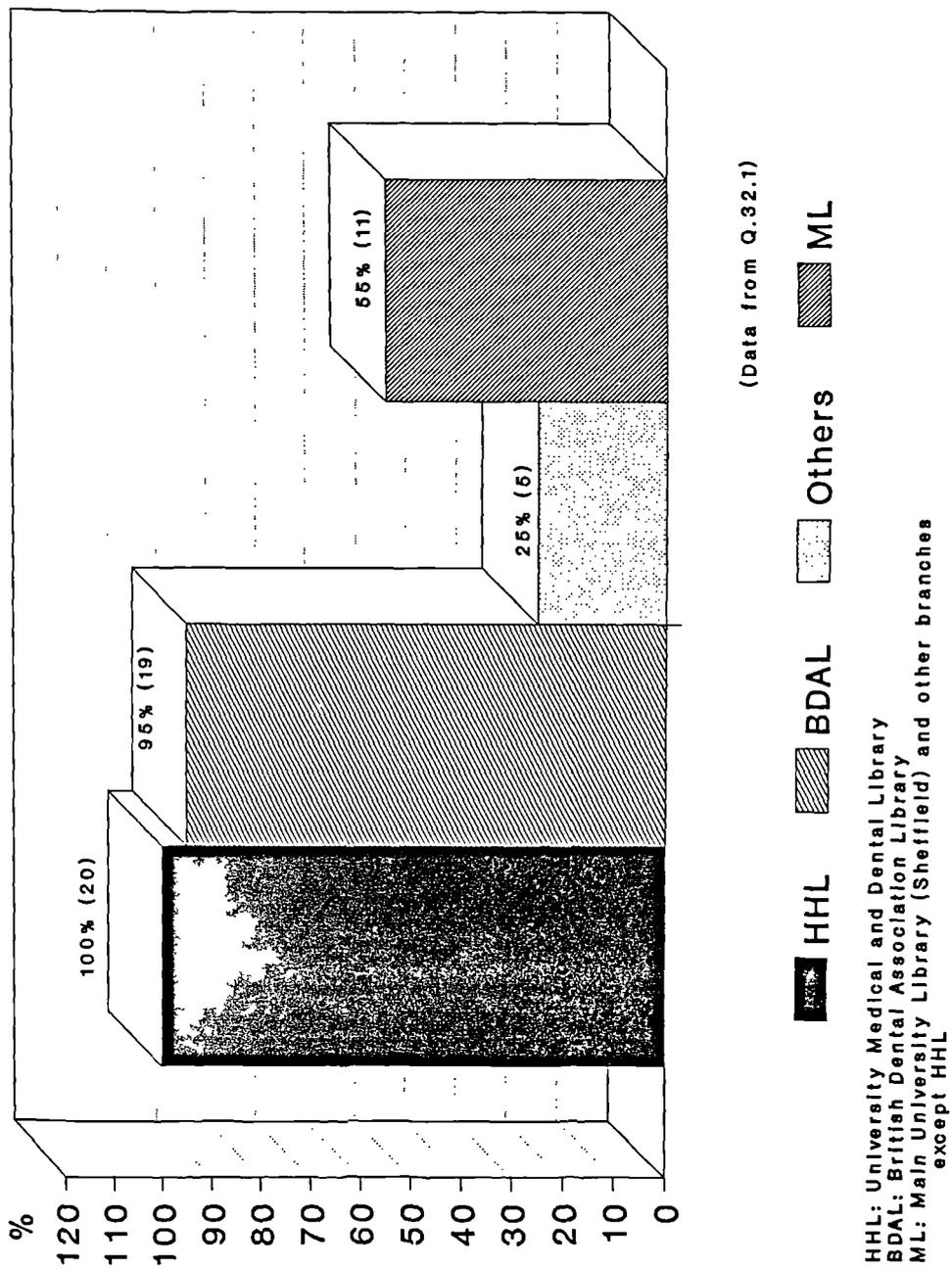
Figure 9.12: **Libraries used by academic staff**

> R: Going to get some information for research during the last month.
> I: What subject?
> R: Quantity of clinical work carried out in relation to final examinations by students [undergraduates].
> I: How did you look for this information?
> R: First of all in the "Index Medicus".
> I: "Index Medicus" or "Index to Dental Literature"?
> R: Dental. Then I went to ask the librarian for help, if she could do a search for me, an information search.
> I: So you requested an on-line search?
> R: Yes.
> I: And the search is still going-on?
> R: Yes, I'm still looking for information, I've got a print-out from her, [the librarian] she tried three different areas, it's a very vague and spread out subject so it's very difficult to get decent results.
> (Int.No.31/Q.33);

> R: Recently when I was looking for the information on temperature[13].
> I: What did you do?
> R: I looked in the "Index to Dental Literature", then through the journals and then the librarian did a literature search for me, an on-line search.
> (Int.No.39/Q.33);

to check references when they are preparing a paper:

> 'Just before you came here I was in the library checking references for an article that I wrote. I checked most of them by direct access to the journals themselves. I was just checking the accuracy of the references'
> (Int.No.18/Q.33);

> R: I may have a journal here with a paper in it that is something new, that is to say it's usually from an American thing and as a result of that I would probably go to the library to look up a specific, one or two specific references that they quoted from American journals that are kept there or if they weren't there I would request a copy of that journal from the library.
> I: Do you use any other service of the library?
> R: Yes, the Medline search.
> (Int.No.32/Q.33);

or to scan regularly new books and journals:

> R: I walk in there and I go out to the shelves to find the journal, the bound volume of the journal that I need and I take it down and read it. That's the most frequent situation.
> I: Do you read it in-situ?
> R: About fifty-fifty I read it there, about fifty-fifty I take a photocopy.
> (Int.No.19/Q.33);

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[13]The respondent is doing research on 'temperature changes in the oral cavity' (Int.No.39/Q.1).

'I look at new books regularly' [The respondent goes once a week to check both new books and journals.] (Int.No.37/Q.33)

Using the library is a strategy implemented by academic staff for satisfying clinical information needs, i.e. finding out about a particular medical condition; but above all it is selected for solving information needs arising from academic commitments: teaching, product trials, research projects, publications and postgraduate studies (See Figure 9.13).

Academic staff may perform: i) random subject searches; ii) document searches or iii) formal literature searches, as we can see from the replies transcribed above. These are the same three variations which have already been seen in previous groups. Whilst in the case of hospital staff and community service dentists it seems that they either prefer one variation or the other, in the case of the academic staff, it is clear that they use all three variations, according with specific situations:

R: Up-date prior to lectures.
I: How do you do this?
R: If it is a lecture, I know the subject, I know the journals which will be the best. If I am really stuck out, I will use the Index ["Index to Dental Literature"].
(Int.No.17/Q.33);

'I go to read journals, to look for new books, ask the librarian for help in a search, to check references, for photocopies and interlibrary loans.'
(Int.No.23/Q.33);

R: I use it for journals. So if I was writing a research paper, I would go and check the journals over there.
I: How do you select the journals that you check?
R: From journals which I have got myself, from their references, from the "Index Medicus" and the "Index to Dental Literature" as well.
I: Then?
R: I photocopy the articles that I don't have.
(Int.No.35/Q.33).

They check references when they are preparing a paper, they carry out formal literature searches when they begin a research project, and they look for articles and books which they do not possess, as an extension of **Reading**.

Formal literature searches are widely used by academic staff and they use them more than any other group in the study. Almost all of them (95%) use the *Index to Dental Literature* (See Table 9.12). However, they may prefer the *Index Medicus*, if the topic is closer to Medicine than to Dentistry (Int.Nos.19;21/Q.39). Manual searches are usually by subject but academic staff may also carry out author searches:

R: "Sugar in Medicines" in 1987. [She was preparing a paper on that subject].
I: Was it a subject or an author search?
R: Both. We knew the person who had done most work, so we looked by author-title and also by subject.
(Int.No.30/Q.39);
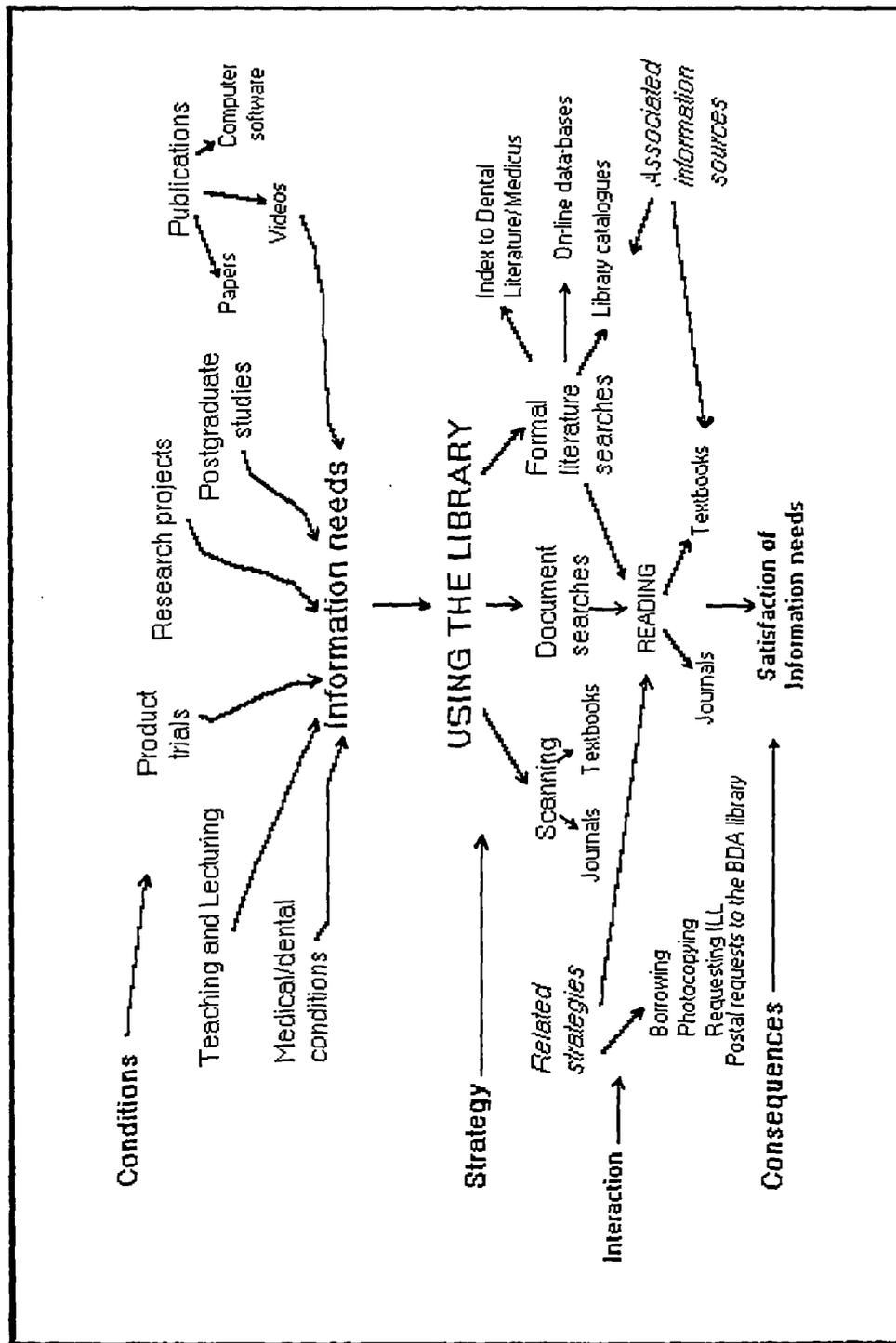
Figure 9.13: Using the library as a basic strategy for academic staff

'The typical situation is when someone says "have you read so's and so's articles" on whatever it is and you are given the name only of the author so you have to consult the "Index to Dental Literature" in the author index in order to find the article that has been written. That's probably the commonest situation of using it' (Int.No.24/Q.39).

Academic staff make author searches as a complement to subject searches or because they are after the papers by a particular colleague. This last instance is usually related to references passed on during informal conversations as in the example above or because they need to identify other people's publications for personnel selection purposes (Int.Nos.16;17/Q.39).

Table 9.12: **Formal literature searches**

Source[a]	YES		NO	
	%	()[b]	%	()
Index to Dental Literature	95	(19)[c]	5	(1)
On-line databases	90	(18)[d]	10	(2)

[a]Data from Q.38 and 41.
[b]Values in () indicate frequencies.
[c]Interviewees have used the "Index to Dental Literature" at least once during the last five years.
[d]Interviewees have requested at least one on-line search during the last 10 years.

In general, academic staff are not very critical of the *Index to Dental Literature* because in their opinion it is easy to use (Int.Nos.16;17;18;21;22;24;27;31-35;39/Q.40.1). As some of the interviewees have explained, familiarity is the main reason for that (Int.Nos.18;21;24/Q.40.1):

'Because it's reasonably well organized and I suppose because I'm used to it' (Int.No.18/Q.40.1).

Ease of access is hindered by the tediousness of the manual search itself (Int.Nos. 23;31;33;35/Q.40.1):

'Once you know the subjects [the subject headings] *you just look them up, it is just very tedious, that's all. Easy but time-consuming'* (Int.No.35/Q.40.1);

'I find it a bit of a bore, a bit tedious. It's time consuming' (Int.No.23/Q.40.1);

'It's very sensibly laid out. As long as you work out the headings that you want to look up there. It's very cross indexed at the beginning anyway to give you alternatives... The only difficulty, I suppose it's the fact that is only in years so you have to go through a lot of books' (Int.No.39/Q.40.1).

However, the *Index to Dental Literature* may present more serious problems. The main one is related to the indexing language:

'It's easy if you are looking for diseases; it is not easy if you are looking for operative procedures. But it wasn't designed to be like that, was it?' (Int.No.17/Q.40.1);

'The main obstacle is terminology, in fact to remember that the "headings" [subject headings] *are based on American terminology. Because of that it is necessary to check the alphabetic list, instead of going directly to the main body of the index'* (Int.No.26/Q.40.1).

As one interviewee said: *'You need to have the right words to retrieve from the system.'* (Int.No.28/Q.40.1). The identification of the adequate subject headings may be difficult because of vocabulary, the *Index to Dental Literature* is produced in the U.S.A. and it follows American terminology; or because the indexing language is not detailed enough, for example in Orthodontics[14].

The printed format has other limitations that also affects the easiness of access. For example, i) there are no abstracts, and the titles alone do not always give an accurate description of the work's contents (Int.No.30/Q.40.1); ii) articles by several authors are cited in full only under the first cited author (Int.No.37/Q.40.1); iii) it is not possible to retrieve by year of publication (Int.No.27/Q.40.1); and iv) there is a considerable time delay between publication and indexing even in the case of supposedly current awareness services (Int.No.37/Q.40.1).

All these shortcomings are partially overcome with a computer literature search in *Medline*. Almost all the interviewees, 90%, have requested a literature search from a library (See Table 9.12); this percentage is the highest for any group in the study[15]. They request on-line literature searches either as a complement to a manual one or to save the time a manual search would demand and always because they need extensive literature reviews for research projects, publications or a doctoral thesis.

Medline is the only data-base used (Int.Nos.16-39/Q.41); it is also the only one that covers Dentistry. On-line literature searches are usually requested from the University Medical and Dental Library (Int.Nos.16-39/Q.44); only two interviewees requested them from the libraries at their previous positions before coming to Sheffield, and one interviewee passed the request to the Department of Information Studies at Sheffield University that carries out literature searches for teaching on-line searches to its students.

Their main praise of the results for these requests is the thoroughness of the search (Int.Nos.16;19;23;25;27;32;33;34;37/Q.45.1):

'Because I found from the print-out that they covered things from a variety of angles and they had as much information as I could have got and more in many cases' (Int.No.34/Q.45.1);

less often they have mentioned speed (Int.Nos.25;28/Q.45.1) and the fact that the service at the University Medical and Dental Library is free of charge (Int.No.28/Q.45.1).

Disappointment with the results of on-line searches is usually related to one shortcoming that *Medline* has inherited from its precursors in printed form (*Index to Dental Literature* and *Index Medicus*): the indexing language. This becomes apparent in the way MESH is constructed and applied. If the topic is not adequately defined with

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[14]Examples of MESH limitations are given on page 209.

[15]See Table 6.14, Table 7.14, Table 8.16, and Table 10.11.

MESH terms, results are less satisfactory because of lack or excess of references. Sometimes the topic has been vaguely defined or it is too broad and the user needs to evaluate results and re-define the search (Int.Nos.31;39/Q.41-45); sometimes it is quite the contrary, there is *surplus information* (Int.No.24/Q.45.1). Certain topics are likely to obtain better results than others because of the way indexers use the terms, for example the qualifier PATHOLOGY is used in a very loose sense for describing disease; or most references on 'temporo mandibular joint diseases' refer in fact to clinical studies and not to hystopathological aspects and the user discovers all that when he actually reads the papers (Int.No.21/Q.45.1). The problems with the use of MESH are also related to the fact that users are not always experienced enough with this indexing language, and they need to rely on library staff who, despite their experience, are not experts in the dental field.

On-line searches by end-users may well increase both the users' skills to retrieve information and the quality of the results, but unfortunately at the time of the interviews[16] the CD-ROM version of *Medline* had only been operating for a month at the University Medical and Dental Library, as a consequence that service was not covered by this study since the majority of the interviewees would not have had time to know about it.

Using the library may be selected as an initial strategy, because academic staff –unlike other groups in the study– feel confident of success in doing so:

> *'It covers most of the journals relevant to the field that I am working in'* (Int.No.24/Q.11);

> *'Because it's at hand, it's very convenient. We've got a very good library. A good selection of journals. And if I need to I can refer to it again'* (Int.No.31/Q.11);

> *'The information that I usually need is held in the library or they can get it for me very quickly'* (Int.No.33/Q.11);

> *'Whenever I want information I would go to the library first. I think that everything that I want is in there'* (Int.No.39/Q.10-11).

Time, speed and access do not seem to represent any obstacles for selecting this strategy. In fact **Using the library** matches their perception of information, which in turn is determined by the nature of their information needs: previously reported study cases, state of research in a particular area, published clinical results on techniques... It is always information in printed form that can satisfy these information needs, and if their personal collections cannot provide the information, then the only alternative is **Using the library**.

9.3.2 Patterns of information-seeking behaviour

Academic staff satisfy most of their information needs by using printed literature sources to the extent of almost equating information with printed literature. Therefore **Reading** and **Using the library** are their key strategies for seeking information.

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[16]The interviews took place in June/July 1989.

Whenever another strategy is used it is because the information cannot be found in a literature source or they do not know which literature source may have it. **Reading** and **Using the library** appear in simple, combined and complex patterns but these strategies also appear complementing each other, which is again a particular characteristic of the information-seeking behaviour of this group.

Simple patterns are likely to appear in the context of any clinical or academic task (See Figure 9.14). Situations in the clinic regarding the diagnosis of an oral condition or the clinical history of a patient are solved by checking a reference book, i.e. **Reading** (Int.No.23/Q.1) or contacting the general dental practitioner, i.e. **Talking** (Int.No.25/Q.1). However, most examples given refer to research work and the preparation of publications. **Using the library** is the main strategy in both situations and the main variation is formal literature searches (Int.Nos.16;19;22;23;31;34;39/Q.1):

> *R:* [The respondent is doing] *research into tooth movement in an experimental animal.*
> *I: How did you get the information?*
> *R: I did a computer search in the library and found the journals.*
> (Int.No.19/Q.1);

> '*I needed information for the work you've just seen me doing with the day sheet, an update of the students work, I am trying to relate that to their final exams. So I wanted information about what would have been done in the past for that. So I went to the library and asked them for ... to go through past work and see what would have been done on that; and they threw out a print-out, and I've worked with that*' [She requested an on-line literature search from the University Medical and Dental Library] (Int.No.31/Q.1);

> [The respondent was preparing a case report on male breast cancer with metastasis to the jaw. He wanted to find out previously reported cases on similar conditions. He made an on-line search in "Medline" using the newly installed CD-ROM version; then he followed up references from the papers identified in the initial search and finally he requested an on-line search from the University Medical and Dental Library to cover the period prior to 1986 which is not available in CD-ROM.] (Int.No.22/Q.1).

A research project, a case study, a thesis, an article, all these situations require extensive literature searches to assess previous research, but the preparation of non-printed publications poses different information needs. For example how to organize the script for a video, what can be done and what cannot be done; the strategy in this case is **Enquiring** from Sheffield University Television (Int.Nos.23;24/Q.79). Another example is learning to use photograhic equipment for taking slides; the selected strategy is **Talking** to a colleague at work who knows how to use that equipment (Int.No.32/Q.79). The development of a special software for research into temporo-mandibular joint and electromyography requires the expertise of computer people to write the programme and the strategy is again **Enquiring** in this case from Computer Services at the University of Sheffield (Int.No.17/Q.81).
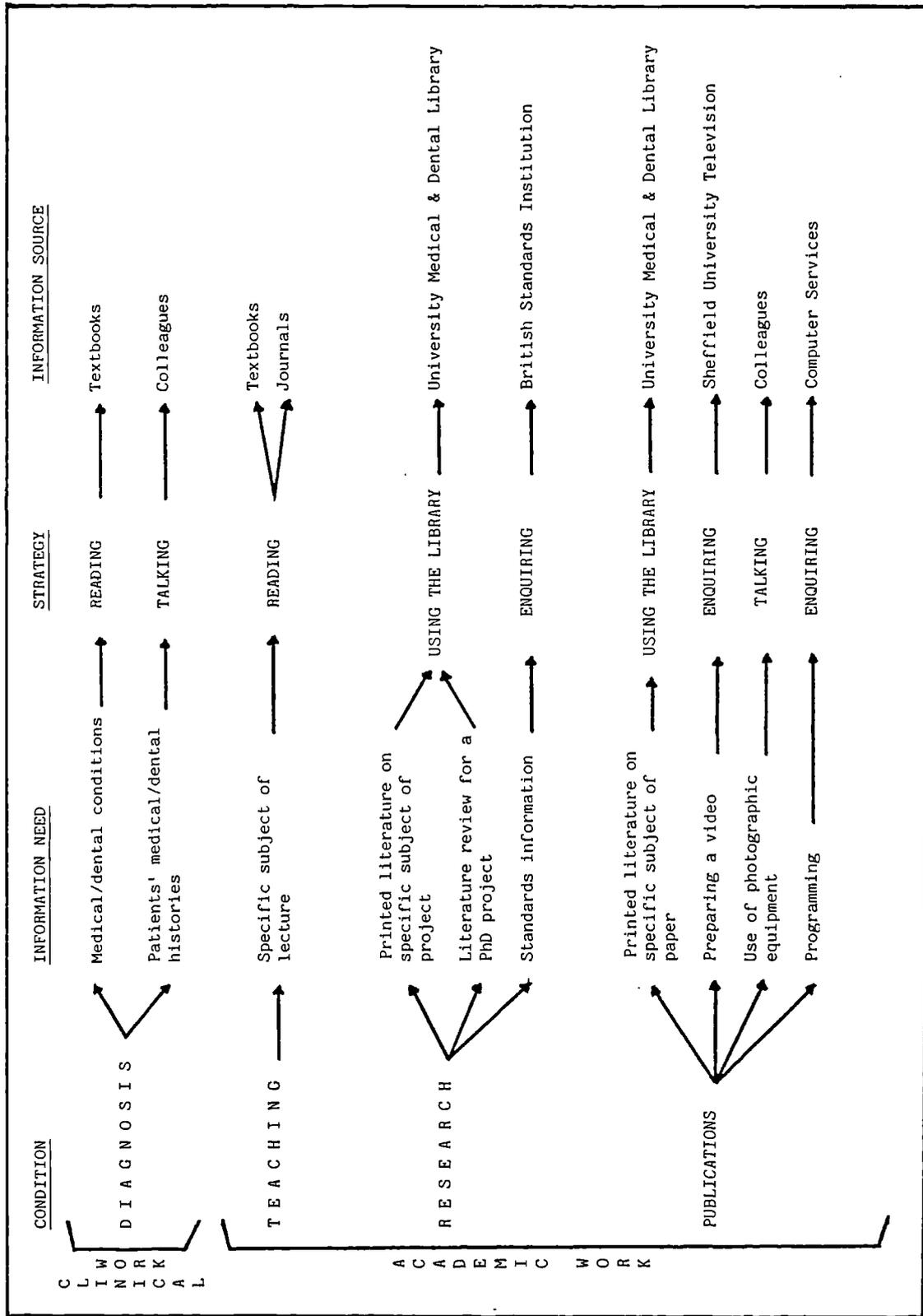
Figure 9.14: Simple Patterns - Academic staff

Simple patterns indicate a trend that pervades the information-seeking behaviour of academic staff: if the information can be found in a literature source then that source is selected and as a consequence the possible strategies are **Reading** or **Using the library**.

The common characteristic of combined patterns is that the initial strategy is either **Using the library** or **Reading** and they are complemented by either **Talking** or **Enquiring**. The second strategy is an extension of the first one, i.e. asking a colleague about articles on a specific topic or it provides non-literature information (See Figure 9.15):

> *R: I've been asked to do a clinical trial of a mouth spray and I was checking to see if one of the ingredients was in the list of allowed additives to food in order to write for ethical approval.*
> *I: How did you look for the information?*
> *R: I knew there was a book of allowed additives so I rung up the library to find if they had it and then I went there and collected it. Here it is* [He looks for the book in his brief-case and shows it to me].
> *I: Do you propose to seek information in any other way?*
> *R: On this particular material or for the study as a whole?*
> *I: For the study as a whole.*
> *R: For the study as a whole I will be writing a protocol for the ethical committee and I will be consulting the recent literature for that [...] apart from the book on additives I also may enquiry with colleagues for critical references on the recent literature of that particular product that I'm investigating. And I have some references, I've collected some references already, and the book and I should think that I will be able to write the protocol with the information that I have already.*
> (Int.No.24/Q.1);

> *R: Do you mean a clinical situation?*
> *I: Any situation related to your job.*
> *R: I haven't for a clinical situation, but then giving that my job is lecturing including research then I have needed information to produce a paper.*
> *I: What kind of information did you need?*
> *R: Well a literature review to start off with a literature search.*
> *I: How did you do it?*
> *R: I contacted the library for a Medline search and I had to contact them again to get various papers.* [The respondent contacted the library to get papers identified by the on-line search and further references identified by reading these papers.] *Sometimes also it has involved having to talk to a statistician to get information on the best test to use on the data.*
> (Int.No.30/Q.1);

the non-literature information may be advice about analysing data (Int.No.30/Q.1), enquiries about computer equipment used for a research project (Int.No.33/Q.81) or enquiries from publishers about the rules for submitting papers (Int.No.31/Q.75).

A pattern frequently described is **Reading** and **Using the library** complementing each other (Int.Nos.17;18;25;26;33;35;39/Q.1;75-76;79):
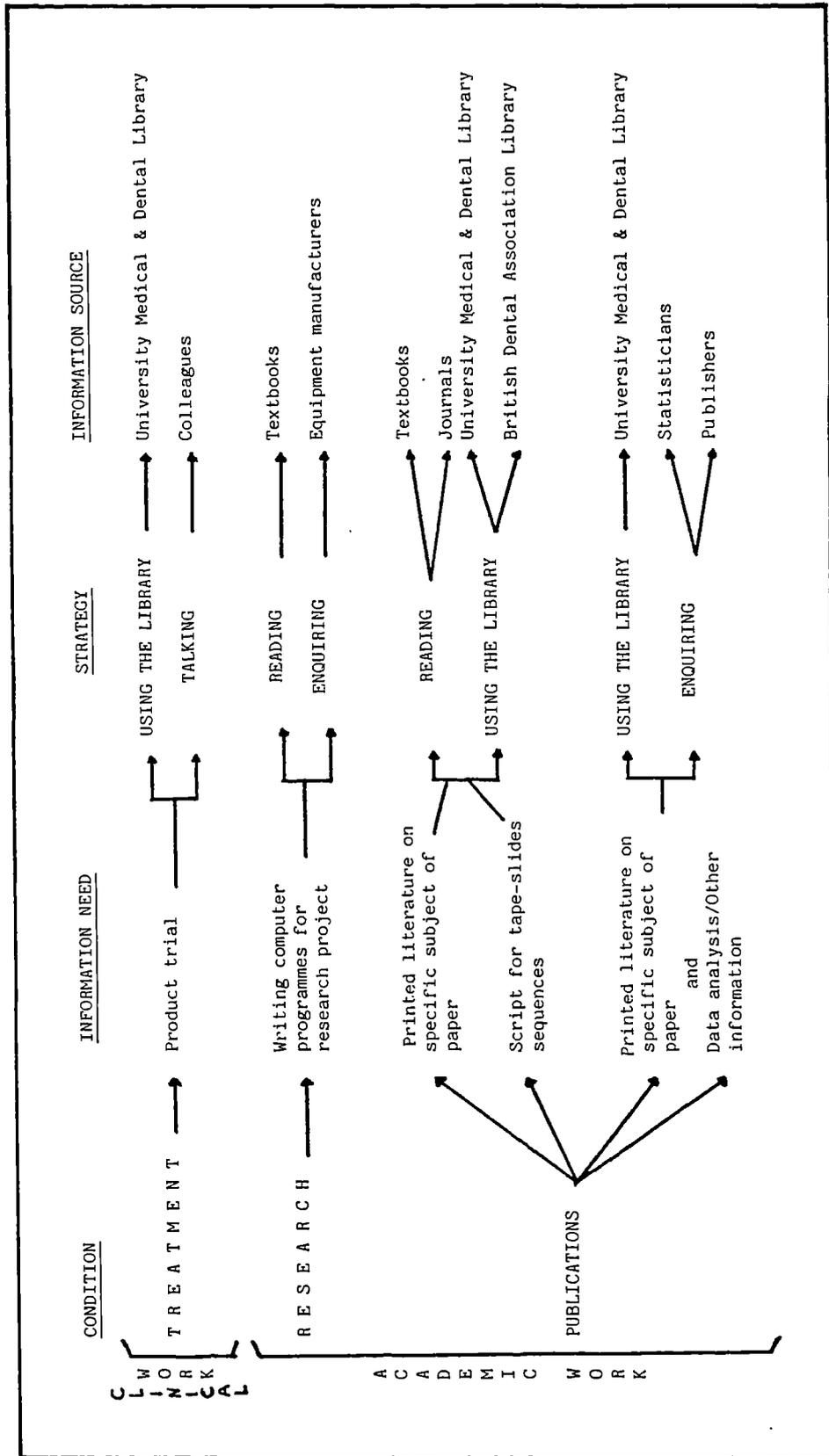
Figure 9.15: Combined patterns - Academic staff

R: References for a paper.
I: How do you get these references?
R: From other articles, from the library, from my own source of literature recording data [the index to his personal collection].
I: When you say that you get references from the library, in which way do you get them?
R: I would use either the "Index Medicus" or "Index to Dental Literature" or have a Medline search.
(Int.No.18/Q.1);

R: I'm looking some information for a research paper.
I: How do you look for this information?
R: First of all I've looked in journals and textbooks. First of all I go to the textbooks and then to the journals that I've got. I'm going to write to the BDA library, [British Dental Association Library] *they produce ... packages ... that can give a broad ... general background then after that I will go to the "Index Medicus".*
I: "Index Medicus" or "Index to Dental Literature"?
R: I use both actually, it depends on the subject. After this morning I might be using the CD-ROM. [The respondent is going to a training session at the University Medical and Dental Library after the interview to use the CD-ROM version of Medline] *I also have got my own computer with a reference data-base on it.*
(Int.No.35/Q.1).

This combination of **Reading** and **Using the library** has been described by other groups in the study (hospital staff and community service dentists)[17] but in the case of academic staff both **Reading** and **Using the library** show the same variation: formal literature searches. Academic staff carry out a systematic literature search, starting with their own collections and continuing with the library collection and data-bases. This is possible when personal collections are organized like library ones, a case only found among academic staff[18].

Complex patterns described by academic staff show less variety than those described by other groups in the study. The initial strategy is always **Reading**, extended by **Using the library** and then complemented by **Talking, Enquiring** or even **Watching** (See Figure 9.16):

'... Also I need information on various diseases so I would go and look up things in the library or even from my own books or ask colleagues ... '
(Int.No.27/Q.1);

R: I wanted to find an index, a disease index.
I: How did you set about to find this disease index?
R: I read a paper which I knew had a particular index on it, which was the last one I could remember, which was 1970's. Then I looked in "Index to Dental Literature", to find if there was another one. We also contacted

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[17]See Figures 7.17 and 8.7.
[18]See Reading page 233.

someone in Birmingham who we knew might be involved in the same kind of thing.
I: Did you find it?
R: Yes.
(Int.No.37/Q.1);

R: I often read periodicals and journals for backing up work that we are doing in order to relate what we are doing to other people's work.
I: How do you find this information?
R: Through the library, the university and medical library. [The Main University Library and the University Medical and Dental Library; occasionally the respondent uses external libraries such as the British Dental Association Library or the Royal College of Surgeons of Edingburgh library. The respondent gets information from other media: video tapes, to a certain extent from literature mainly leaflets received by post, also from journals such as "British Dental Journal" received at home].
(Int.No.33/Q.1);

R: The situation is paper that I am writing ... Do you want more information?
I: Yes.
R: A paper that arises out of a specimen, a case that we have which is unusual, relatively rare, therefore is worth producing a case report. Part of the stimulus for doing that is that the clinician concerned, the surgeon, also wanted to write a paper about it. In fact he was the instigator ...
I: How did you look for information then?
R: Initially to what I would called bench pathology books: books, textbooks and specialized pathology books that we have in the department as the first source. My own reference system as a second source because I've kept over 20 years my own reference file. Having exhausted both of those, I then went to the library, the Medical and Dental Library, I looked up selected journals based in what I've already had from my own references and the books in our department. I also organized a Medline search. Having got that I then went to the Department of General Pathology and looked up their bench collection and consulted colleagues in that department.
I: Anything else?
R: I also spoke to someone who I knew, who is a specialist in that particular area in Nottingham, a personal communication.
(Int.No.21/Q.1).

Reading and **Using the library** dominate the information-seeking behaviour of academic staff. Combined and complex patterns are consistently based on these two strategies. As a consequence the information-seeking behaviour of academic staff is more homogeneous than that of other groups in the study, for example similar complex patterns are used to deal with different conditions (See Figure 9.16). Other strategies like **Talking** and **Enquiring** have a secondary role. **Watching** is very seldom perceived as a strategy for seeking information. **Attending/organizing continuing education events** is a background strategy, and it is not actively integrated in their patterns of information-seeking. The homogeneity of their information-seeking

behaviour is related to their patterns of job tasks and more specifically to the information needs that these tasks provoke. Since academic staff are mainly involved with research and teaching, their information needs can be reduced to a single one: latest published developments in each speciality. This is not, in fact, their only information need, but it is the one that they feel as the most important. The very nature of their information needs makes literature sources the most important information sources. The final consequence is that their information-seeking behaviour relies necessarily on **Reading** and **Using the library** to an extent that it does in no other group in the study.
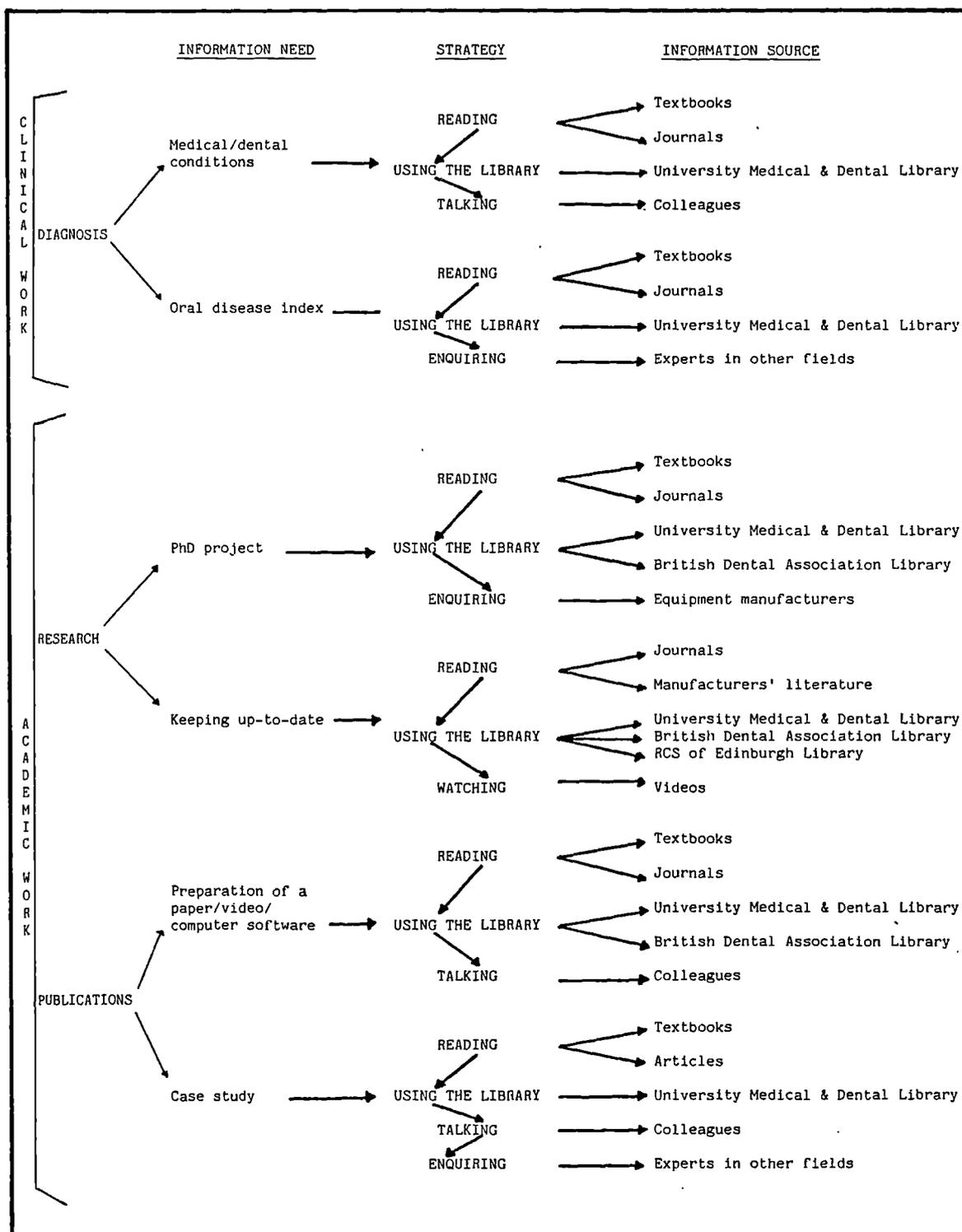
Figure 9.16: Complex patterns - Academic staff

Chapter 10

The Use of Information by Postgraduate Students

10.1 The dental professionals in full-time postgraduate education

This was the smallest group in the study because it included only full-time students, who were not actively practising, except for the clinical part of their studies.

In May 1989 there were 12 dentists registered as full-time postgraduate students reading for a masters or a doctoral degree at the School of Clinical Dentistry of Sheffield University. I interviewed 11 (91.7%) of them; only one postgraduate student refused to take part in the study (See Figure 10.1).

The 11 postgraduate students, who agreed to be interviewed, qualified between 1972 and 1986; they were neither newly qualified nor nearing retirement (See Table 10.1). The main difference compared to all the other groups in the study was that the majority of them (81.8%) graduated from foreign universities (See Table 10.2). Since they were actually doing postgraduate studies, most of them did not have any previous postgraduate qualifications; only one interviewee had passed the primary examinations for the Fellowship in Dental Surgery (Royal College of Surgeons of Edinburgh) and two had a master degree (See Table 10.3).

They were based at the departments of Oral Pathology, Restorative Dentistry, Child Dental Health and Oral Surgery; eight were reading for a Master of Medical Science and three for a PhD. Master courses irrespectively of the speciality were taught courses, between one and two years long. The courses involved attending lectures, coursework such as essays, literature reviews, oral presentations, clinical work under supervision and a small research project for a dissertation that was submitted at the end of the course, after the exams.

The set activities of the master course or their own research projects in the case of the PhD students, had been their sole activities for at least one academic year when I interviewed them. They were a group of dentists with study and research commitments only and represented quite an exceptional situation in the dental profession, because not even academic staff were full-time researchers. As a consequence the conditions for their information needs were exclusively defined by their particular projects.
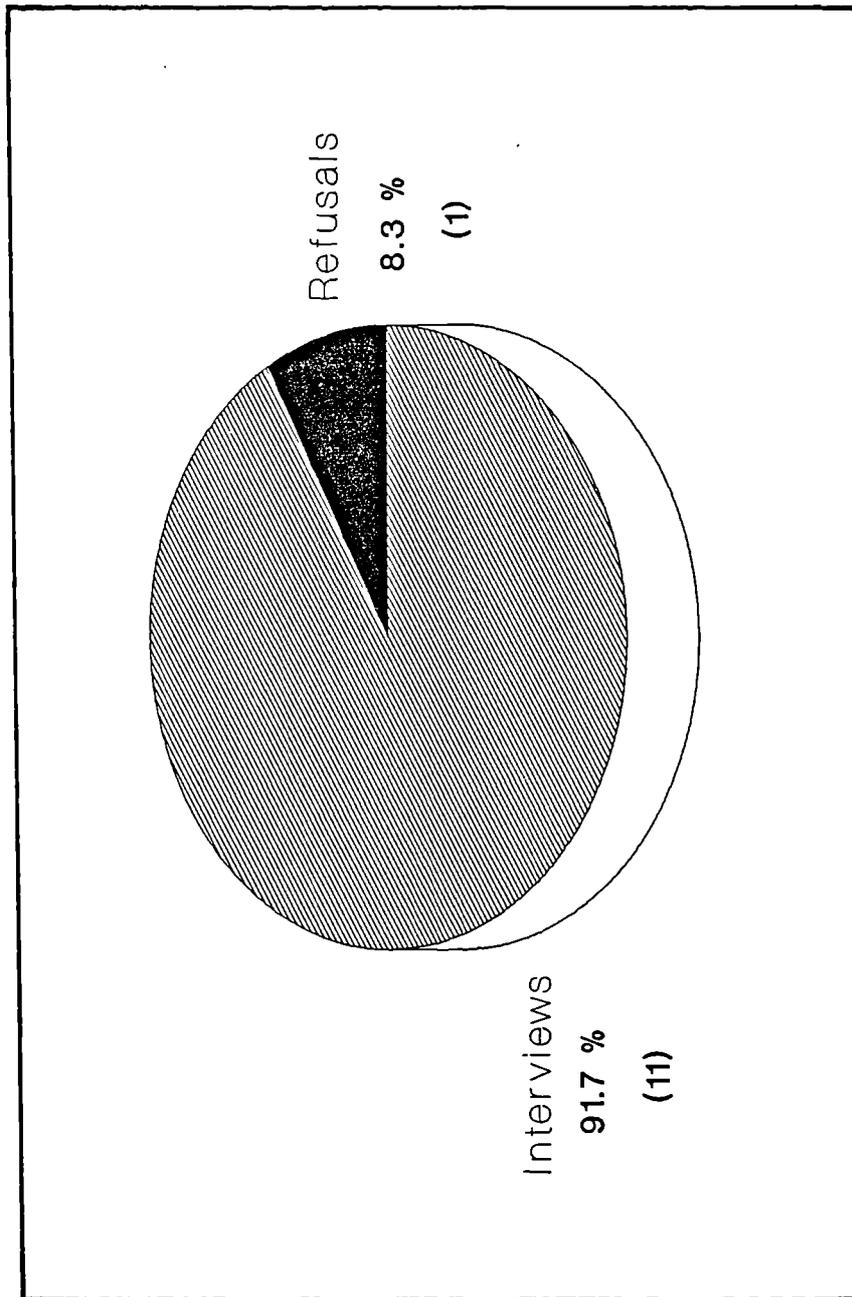
Figure 10.1: Response rate of postgraduate students

Table 10.1: Interviewees by year of graduation

Year[a]	Graduates	%
1972	.1	9.1
1979	1	9.1
1982	2	18.2
1983	2	18.2
1984	3	27.3
1985	1	9.1
1986	1	9.1
TOTAL	11	100.0

[a]Data from Q.48.

Table 10.2: Undergraduate training by dental school

University[a]	Graduates	%
London	2	18.2
Abroad	9	81.8
TOTAL	11	100.0

[a]Data from Q.49.

Table 10.3: Postgraduate training

Level of training[a]	YES		NO	
	%	()[b]	%	()
Professional qualifications[c]	9.0	(1)	91.0	(10)
Postgraduate degrees	18.2	(2)	81.8	(9)
Current postgraduate studies	100.0	(11)	0.0	(0)

[a]Data from Q.50 and 51.
[b]Values in () indicate frequencies.
[c]Membership and Fellowship of the Royal Colleges of Surgeons.

Table 10.4: **Speciality**

Speciality[a]	Interviewees	%
Restorative Dentistry[b]	1	9.1
Oral Pathology	4	36.4
Oral & Maxillo-Facial Surgery	1	9.1
Orthodontics	5	45.4
TOTAL	11	100.0

[a]Data from Q.59.
[b]It includes Periodontology, Conservative and Prosthetic Dentistry.

10.2   The conditions for their information needs

The postgraduate students described situations associated either with specific activities of their taught courses, their research projects or their clinical training. The scope for the conditions of their information needs narrowed down to postgraduate studies and the preparation of publications (See Figure 10.2).

They need information to carry out regular activities for the course:

'I needed information for my reviews of the literature, for my project and my dissertation' (Int.No.2/Q.1);

R: I am doing a MSc at the moment so I continually need information.
I: Could you choose one example?
R: We have a weekly journal club and I have to look up references for that.
(Int.No.3/Q.1).

All of them need information in the form of printed literature for defining their research proposal and writing the literature review:

R: I want to see what other people have been doing or what appliances have been done in Orthodontics. I have the general idea of what I want to do but I do not [want] to do the same so I am looking information because I want to do a different appliance, some small modification or variation of their appliance.
I: How do you seek information about this?
R: Mainly from the journals. Everything that has been used before, it has been published also...
(Int.No.8/Q.1).

A research project may demand to collect data from patients:

R: When you want to review patients after operations.
I: Exactly what kind of information do you need?

> *R: What is bothering them regarding their dental problems, their oral sur-*
> *gical problems.* [The respondent is doing research on the use of a plate
> system to repair jaw fractures, part of the research is finding out how
> patients respond to the treatment]. (Int.No.11/Q.1;3).

Master courses in Oral Pathology, Orthodontics and Restorative Dentistry include
clinical training and students may need information to actually carry out some specific
clinical tasks, for example students in the Department of Oral Pathology examine
specimens of oral tissue and make diagnose; they may need information to decide
about the diagnoses or to support them (Int.No.1/Q.1;3).

Clinical training implies interaction with patients, and that interaction demands
information as well:

> *R: All sorts of journals, books, textbooks. We've got to take courses, lec-*
> *tures.*
> *I: Why do you look for information?*
> *R: Because you've got to know what you are doing. Because you've got to*
> *explain to the patients what you are doing as well.*
> *I: Could you describe a specific situation, or any particular situation in*
> *which you had to look for information?*
> *R: Like the one I am doing now is all brackets and putting wires on. There*
> *are many different techniques of doing it, so I have to look for it, to see*
> *which is the best technique that I should apply to match a particular treat-*
> *ment.*
> (Int.No.4/Q.1).

The preparation of papers for publications also requires information. That infor-
mation is usually printed literature, i.e. previously published papers for the literature
review (Int.Nos.1;2;5;8;11/Q.75). But papers are the result of research work and the
research work itself demands information as well, for example epidemiological data, if
it is an epidemiological survey (Int.No.8/Q.75); opinion from experts in other fields:
'the clinical engineering point of view' in the case of research on a plate system for
jaw fractures (Int.No.11/Q.75).

The focus of their information needs is the specific subject of their course, i.e.
Oral Pathology, Orthodontics, Restorative Dentistry, etc. and within that the specific
topic of their research, i.e. *tooth movement, bonding of orthodontic attachments,*
amelogenesis imperfecta, etc. Almost always the information that they need is in
printed literature, so they identified problems in terms of access to that literature via
the library system:

> *'Information concerning articles in several foreign languages. These jour-*
> *nals are journals from the national dental associations from many, many*
> *countries. So there are not many* [places] *where I can read them, so I have*
> *to find these articles through other libraries'* (Int.No.2/Q.5);

> *'In general the less recent information. The library doesn't carry anything*
> *before 1966. It is possible to get this information but it's more complicated'*
> (Int.No.3/Q.5);
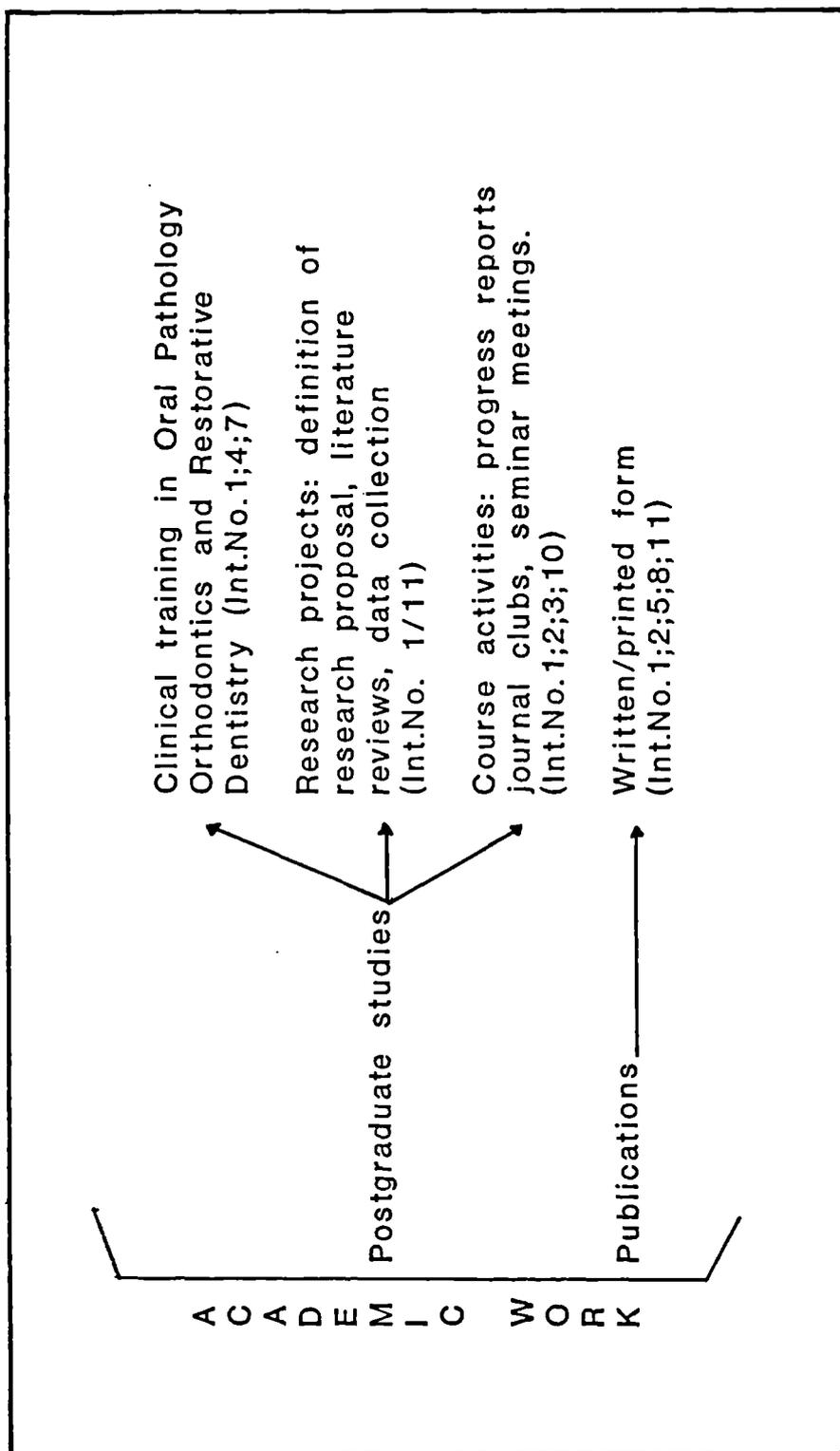
Figure 10.2: Conditions for information needs of postgraduate students

> 'It is not so difficult because there is quite a lot in the library. But the most difficult thing that I have found in our library is that you can't get the dates of some journals because they are limited to the mid 1970's. It's quite limited. You have to go to the big library [Main University Library] when you ask for some references' (Int.No.4/Q.5);

> R: Small, not very important journals, so they don't keep them in the library; they are not British journals [...]. Because they do not have them here [University Medical and Dental Library] so I have to order them.
> I: Do you order them through interlibrary loan?
> R: Yes.
> (Int.No.6/Q.5).

Other possible problems are:
i) lack of published information on new findings (Int.No.5;7/Q.5):

> '... for example in Dentistry you are working with certain materials, sometimes ... there are different manufacturers and every manufacturer will say that this one material would do so and so. If you ask for scientific data for example in my study now I am working with very recent materials, we don't have any information which tells you whether these materials will survive or not, will satisfy the patient or not. [...] We should wait and watch the clinical performance of such materials to judge whether it is good or not; and there are problems sometimes when you have patients, you would be hesitating to take [to make a] decision whether to use this material or not, because if the patient embarrasses you with a question, how it would survive, you can't tell' (Int.No.7/Q.5);

ii) information on patients' responses to treatment because the patients are not able to describe any particular symptom, so they have to monitor patients through X-ray examination only (Int.No.11/Q.5);
iii) use of a second language for their studies:

> 'Two problems, one is language because some new words I don't know so I am totally lost when I read the article. The other one I don't know the meaning' (Int.No.10/Q.5.1).

Command of English, the language of the postgradaduate course, was obviously a problem for several interviewees whose first language was not English, although only one admitted that.

The established activities of their postgraduate studies generate an homogeneous set of conditions for information needs, that moves around the use of printed literature. The pre-eminence of printed literature as an almost exclusive information source influences the patterns of information-seeking that are always based on **Using the library**. However, the other basic strategies are also implemented, as we shall see in the next section.

10.3 The information-seeking behaviour of post-graduate students

10.3.1 Basic strategies

Reading

This strategy is used by postgraduate students for keeping up-to-date, for preparing a paper or slides and above all for their postgraduate studies (See Figure 10.3).

Reading always refers to printed literature as the associated information source, especially journals; textbooks are in second place and dental magazines are much less used (See Table 10.5). The printed literature that they read is mainly borrowed from the library or from departments at the dental school, only one interviewee also borrows from a member of her family who is a medical doctor (Int.No.1/Q.22.1). Membership of professional associations provides access to journals and 63.6% of the interviewees obtained journals in that way. Personal subscription is the third and least used means of obtaining printed literature. Postgraduate students have not indicated purchasing books or receiving free mailed literature; the former because they rely on library services to obtain them, and the latter because they are temporarily out of practice and away from their professional address (See Table 10.6).

Postgraduate students read at least one specialized journal relevant to their speciality, for example *British Journal of Orthodontics*, *British Journal of Oral & Maxillo-Facial Surgery* or *Journal of Oral Pathology & Medicine*:

> *'Because it has got authors who are very prominent people and you have to know what they are thinking, what are their ideas related to what I am doing and also for my examinations as well'* [The respondent refers to the 'British Journal of Orthodontics'] (Int.No.4/Q.14.3);

the specialized journals provide basic background information for their courses.

They also read general dental journals to keep in touch with developments in the profession:

> *'It contains relevant information regarding short-courses, individual case reports on certain operating procedures, social meetings and academic meetings; who's doing what today in Dentistry; news about what happens to the NHS concerning Dentistry and international news'* [The respondent refers to the 'British Dental Journal'] (Int.No.11/Q.14.3);

however, the *British Dental Journal* is read by only 45.45% of the interviewees; the majority of them are foreign dentists who are temporarily in the U.K. and quite naturally they are less interested in British dental issues. This is also the reason for the appearance of some foreign titles, for example *The Angle Orthodontics* or *Stomatologia*, when in all the other groups of the study, the journals read on regular basis are almost always published in the U.K.[1]. Finally the medical journals, like *British Medical Journal*, *Cancer*, *The Lancet* and even a general scientific journal like *Nature* are read regularly by students in the Department of Oral Pathology because

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[1]See Table 6.7, Table 7.8, Table 8.11 and Table 9.8.

Table 10.5: **Reading by type of document**

Type of document[a]	PS	
	%	()[b]
Journals	100.0	(11)
Textbooks	72.7	(8)
Magazines	27.3	(3)

[a]Data from Q.14;22 and 23.
[b]Values in () indicate frequencies.

Table 10.6: **Origin of the literature**

Origin[a]	PS	
	%	()[b]
Borrowing	100.0	(11)
Membership	63.6	(7)
Subscription	45.4	(5)

[a]Data from Q.14 and 26.
[b]Values in () indicate frequencies.

they need information about cancer research in general as well (Int.Nos.1;2;5/Q.23) (See Table 10.7).

Reading journals has been identified as an initial strategy only by two interviewees and in both cases the reason is that journals provide up-to-date information (Int.Nos.2;8/Q.9-11):

'They [the journals] *tell you about new research, new results periodically. They are up-dated*' (Int.No.8/Q.9-11);

in fact, they have expressed a preference for a kind of information source rather than for **Reading**, and journals are both received at home and borrowed from the library.

As academic staff, all postgraduate students keep personal collections of books and journals, and they all have access to departmental collections in the dental school. They keep journals, photocopies and course notes. Most of them keep these materials filed by subject, following a personal subject subdivision system (Int.Nos.1;2;4;7;9;10/Q.29.1). One interviewee keeps photocopies of articles in alphabetical order by title (Int.No.5/Q.29.1). Another interviewee keeps articles in alphabetic order by author and by year of publication (Int.No.8/Q.29.1) and others simply keep them in no specific order (Int.Nos.3;11/Q.29.1). Only one interviewee files photocopies by year of publication and keeps an alphabetic author index in card form (Int.No.6/Q.29.1)
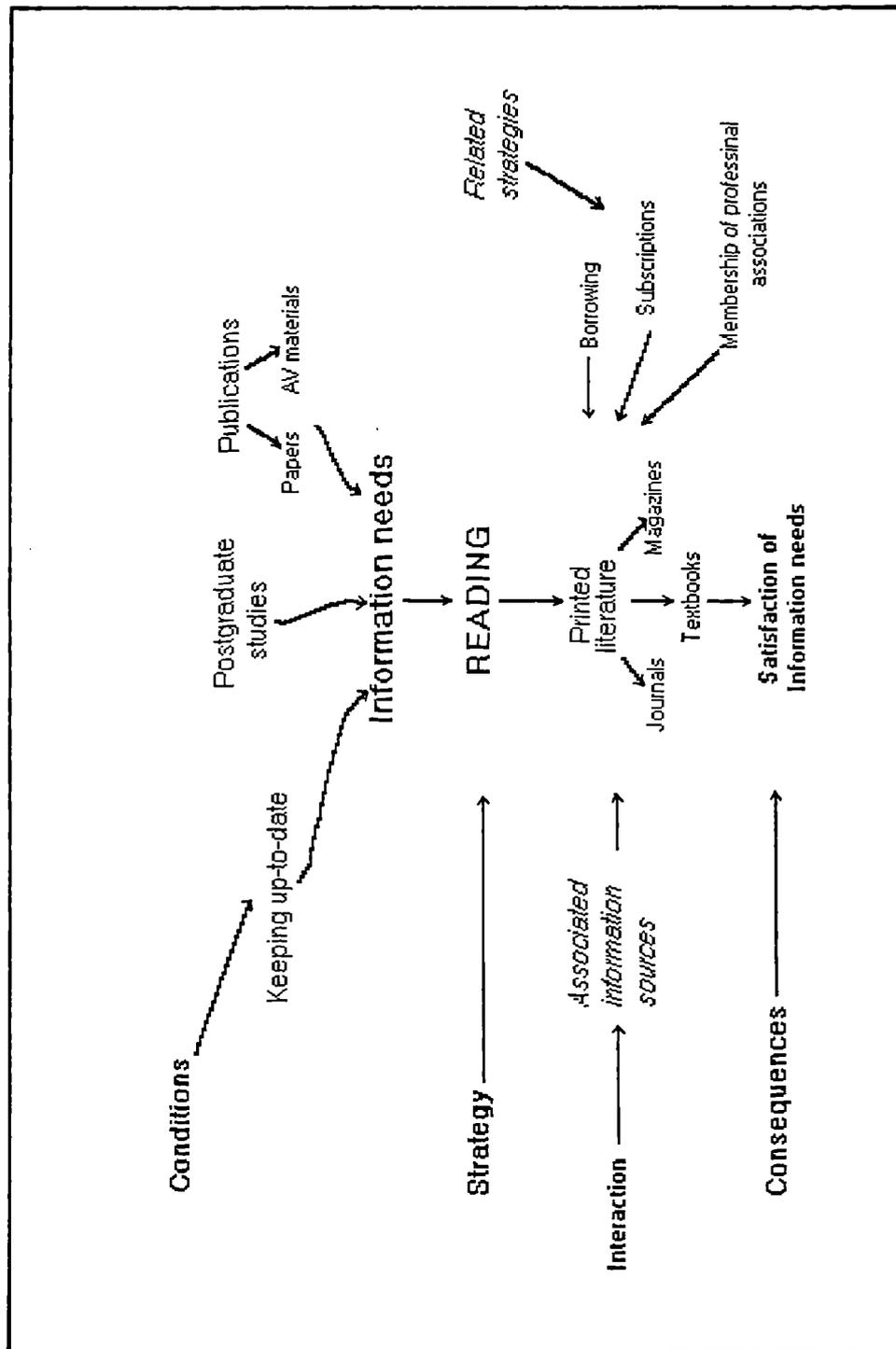
Figure 10.3: Reading as a basic strategy for postgraduate students

Table 10.7: **Journals and magazines read by postgraduate students (PS)**

Journals and Magazines[a]	PS	
	%	()[b]
American Journal of Orthodontics...	27.3	(3)
The Angle Orthodontics	18.2	(2)
British Dental Journal	45.45	(5)
Br.J. of Oral & Maxillo-Facial Surgery	9.1	(1)
British Journal of Orthodontics	45.45	(5)
British Medical Journal	27.3	(3)
Cancer	9.1	(1)
Dental Update	18.2	(2)
European Journal of Orthodontics	27.3	(3)
FDI Newsletter	9.1	(1)
Journal of Clinical Orthodontics	18.2	(2)
Journal of Oral and Maxillo-Facial Surgery (Athens)	9.1	(1)
Journal of Oral and Maxillo-Facial Surgery (Philadelphia, Pa.)	18.2	(2)
Journal of Oral Pathology & Medicine	18.2	(2)
Journal of the American Dental Association	18.2	(2)
Journal of the Jordan Dental Association	9.1	(1)
The Lancet	18.2	(2)
Nature	18.2	(2)
Oral Surgery, Oral Medicine, Oral Pathology	18.2	(2)
Quintessence International	9.1	(1)
Stomatologia (Athens)	9.1	(1)

[a]Data from Q.14;22 and 23.
[b]Values in () indicate frequencies.

They have access –in theory– to the same departmental collections described by the academic staff[2]. But some interviewees did not actually know what was available in those collections (Int.Nos.3;4;6;7;9/Q.30) because most of the time they used the University Medical and Dental Library.

Neither their personal collections, nor the departmental ones seems to have a very important role in the information-seeking behaviour of postgraduate students. Reading in the case of postgraduate students is more a complement to **Using the library** than a strategy on its own.

Talking

This strategy is part of the daily routine of postgraduate students. **Talking** is used either informally or formally to seek information about patients, new developments, their research projects and dental health policies (See Figure 10.4).

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[2]See page 235.
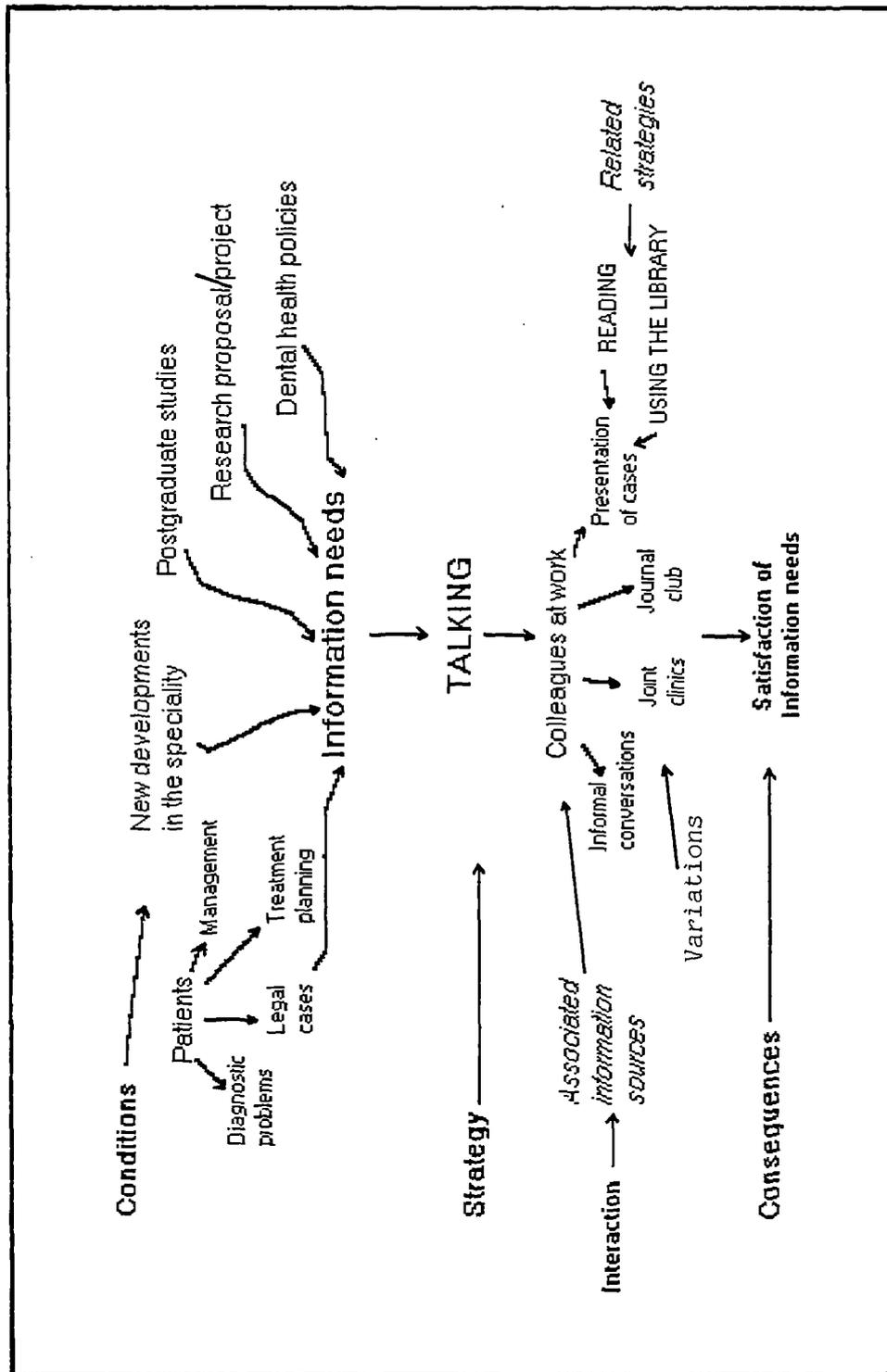
Figure 10.4: Talking as a basic strategy for postgraduate students

In the first place **Talking** is used by postgraduate students to seek information related to the clinical tasks of their training:

> *'Some patients I've done and then something doesn't seem to be quite right or I am not very happy with it. So I just ask some colleagues for suggestions maybe help me out to see if I can get it better. Also sometimes a new patient ... and you want to do a treatment planning for a patient so you want to get ... someone else's opinion'* (Int.No.4/Q.17.1);

> *'Last week a patient who doesn't like removable denture, he likes a bridge where his case is indicated for a removable denture. I had to discuss with my supervisor to examine the patient himself and took advice because a bridge was possible'* (Int.No.7/Q.17.1);

> *'A cancer case that I had [...] about two months ago. Early stages of tongue cancer [...] I discussed with the consultant in a combined clinic'* [The combined clinic was with the consultant in oral surgery, the consultant in radiotherapy and the respondent.] (Int.No.11/Q.17.1).

Postgraduate students discuss regularly about the particular cases they have to deal with as part of their clinical training. They have informal conversations with other postgraduate students, academic and hospital staff, usually in the clinic:

> *'Sometimes in front of the patient, sometimes before I have the patient. If I have a chance and my colleague is free, we discuss it before'*
> (Int.No.7/Q.17.3);

> *'Usually in the clinic; sometimes the patient is there, sometimes only the record of the patient is there'* (Int.No.8/Q.17.3).

Their clinical work is always under the supervision of lecturers or hospital staff, as a consequence these unplanned conversations are an integral part of their training:

> *'Our supervisors are around every clinic. They ask questions from us or we ask them suggestions'* (Int.No.6/Q.17.3).

The formal patterns of interaction are joint clinics and presentations of cases. Joint clinics are arranged ad-hoc by postgraduate students to deal with very serious cases, or cases related to their specific research:

> *'You find a certain case that you believe it's cancer, then you organize a second view with the oral surgery consultant and the radiotherapist consultant'* (Int.No.11/Q.17.3);

> *'... I have to book the patients for these new materials: glass ionomers, composites and veneers along with my supervisor. These patients are booked when my supervisor is on the floor'* (Int.No.7/Q.17.3).

Postgraduate students in the Department of Oral Pathology attend the *clinical pathological conference* once a week during term time, where academic and hospital staff present cases for discussion. The other formal interaction is the inter-school meetings of the departments of Oral Pathology from Sheffield, Leeds, Manchester and Liverpool Universities. Although they never make a presentation themselves, they take part in the discussion (Int.Nos.1;2;5;10/Q.16.3;17.3)[3].

Talking is also a strategy to find out information about new developments in each speciality (Int.Nos.1-11/Q.18.1). The informal interaction is unplanned conversations at work (Int.Nos.4;6;7;9;10;11/Q.18.3). The formal interaction is the journal club. The Departments of Oral Pathology and Children's Dentistry hold weekly meetings of staff and postgraduate students to discuss selected papers on new advances in the respective specialities (Int.Nos.1;3;5;8/Q.18.3). In this case **Talking** is related to **Reading** and **Using the library** because the person who makes the presentation has looked for a suitable paper in the library or in his/her personal collection.

Talking to the supervisor is another variation of this strategy, used by postgraduate students to seek information about their personal research project. The patterns of interaction may be both formal and informal, for example arranged appointments and conversations during coffee break. But unless **Talking** is combined with some other strategy like **Reading, Enquiring** or **Using the library**, it does not fully succeed in this particular instance[4].

Finally information about dental health policies in the U.K. and in each other's countries is also obtained by means of informal conversations at work (Int.Nos.1-11/Q.19).

Face-to-face communication with a more experienced colleague is considered an easy, fast and safe way of seeking information; these are the reasons why **Talking** has been identified as an initial strategy:

> ' [I] *ask somebody if* [s/he] *has heard or read about the topic. If not I go to the library [...] You ask someone who knows more than you, either you ask a lecturer or a professor [...] It's easier [...] because it is direct communication'* (Int.No.5/Q.9-11);

> [The respondent would ask some member of the staff at the dental hospital/school first, if she needed patient-related information.] *'because I trust them ... It's easy and ready ... It's the quickest way'* (Int.No.6/Q.9-11);

> *'To ask someone with more experience because if you just go to the library you would be lost. It is best to take advice from experienced academic staff'* (Int.No.7/Q.9);

as an initial strategy **Talking** has another value as well, it is an alternative to **Using the library**.

Talking as an information-seeking strategy is integrated with the course activities of postgraduate students: work in the clinic, journal club, research project, etc. Formal and informal patterns of interaction are similar to those of other groups in the study, but **Talking** in the case of postgraduate students always refers to colleagues

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[3]See page 239.

[4]See **Patterns...** page 304.

at work, i.e. colleagues in the dental hospital/school; that environment provides ample opportunities for implementing this strategy. On the other hand, postgraduate students do not have much access to colleagues outside work because they are away from their established practices, living temporarily in a new town where they do not have previous professional links.

Enquiring

Postgraduate students use this strategy to seek information required for their clinical training and their research projects.

Their clinical training includes dealing with patients and working in the laboratory. They may need information about the medical history of a patient, a referral, drugs, dental products or laboratory techniques (Int.Nos.1;2;5;8;9/Q.20). They acquire this information from medical doctors, psychologists, speech therapists, pharmaceutical and dental trade representatives and laboratory technicians (See Figure 10.5).

Their specific research projects may require expertise in subject fields outside Dentistry, for example Materials' Science, Mechanical Engineering, Virology, Pathology, Orthopaedics or Medical Physics (Int.Nos.3;7;10;11/Q.20). They use **Enquiring** to obtain information from the relevant experts in each case: material scientists, mechanical engineers, virologists, pathologists, orthopaedic surgeons or medical physicists (See Figure 10.6).

In both situations, postgraduate students address their enquiries to individuals rather than to organizations (See Figure 10.7) and they make very little use, if any at all, of information services related to Dentistry (See Figure 10.8). These enquiries are made by letter, personal meetings or over the telephone (Int.Nos.1-11/Q.20.3).

General dental practitioners, hospital staff and community service dentists implement **Enquiring** in two stages for seeking information about patients' clinical histories. The first stage is a dialogue with the patient or the parents to assess the clinical condition of the patient; depending on the results of this dialogue **Enquiring** maybe implemented again to obtain further information from medical doctors or other health professionals[5]. Postgraduate students, like academic staff, have never mentioned that first stage; the initial interaction with the patient is not perceived as an information-seeking activity. Again, their conception of information is biased by a close association of information with printed literature. However, patients have been identified as information sources in a different situation: data collection. One interviewee (Int.No.11/Q.1;71) was doing a follow-up study to monitor progress of treatment of jaw fractures using the Mennen plate system, and he was also involved with oral cancer epidemiological studies; in both cases he used **Enquiring** by means of questionnaires to collect data (See **Simple patterns** page 299 and Figure 10.14).

Postgraduate students implement **Enquiring** for seeking factual and practical information (drugs taken by a patient, how to use a piece of equipment) that they cannot find in written or printed form.

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[5]See Figures 6.5, 7.5 and 8.5.
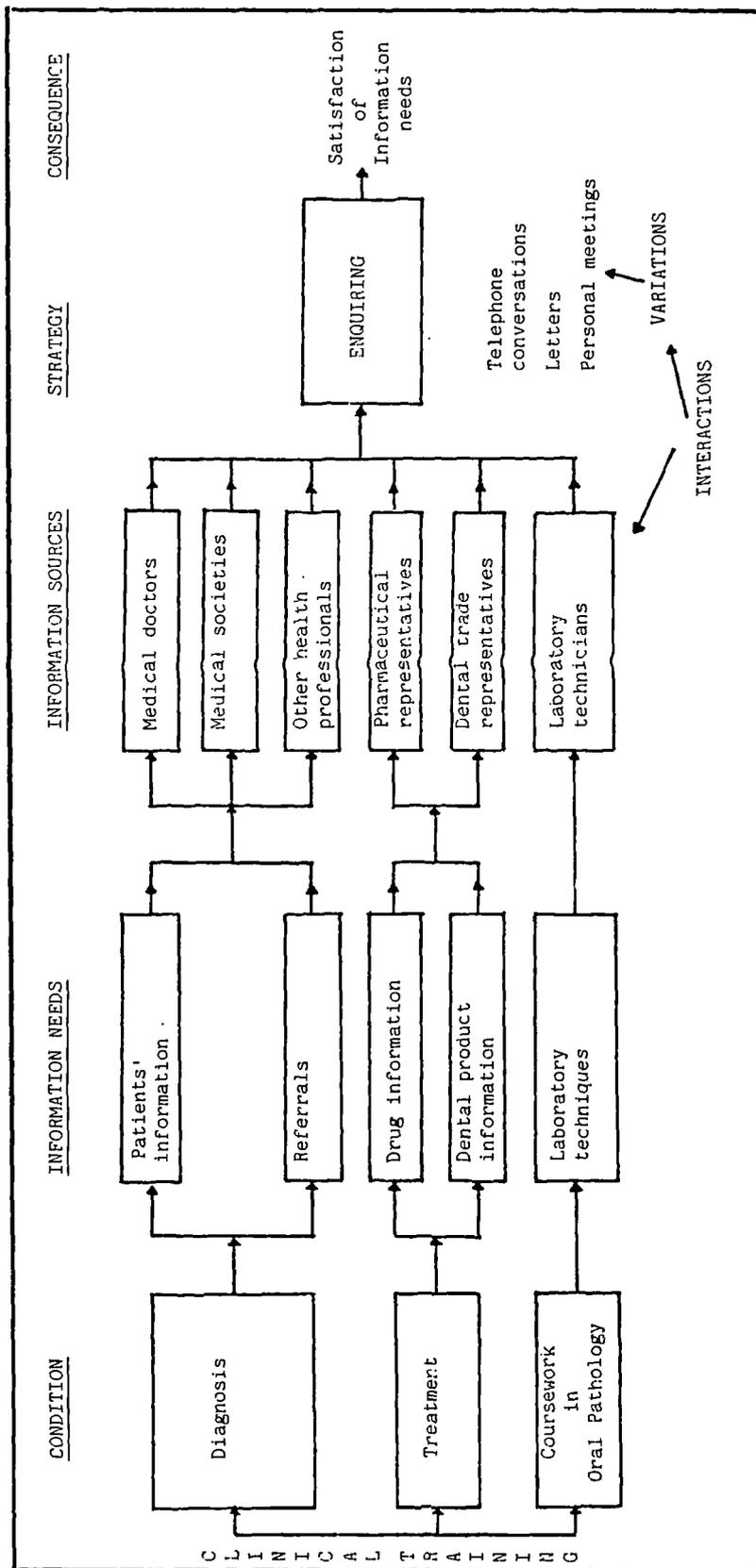
Figure 10.5: Enquiring as a basic strategy to seek information related to clinical tasks - Postgraduate students
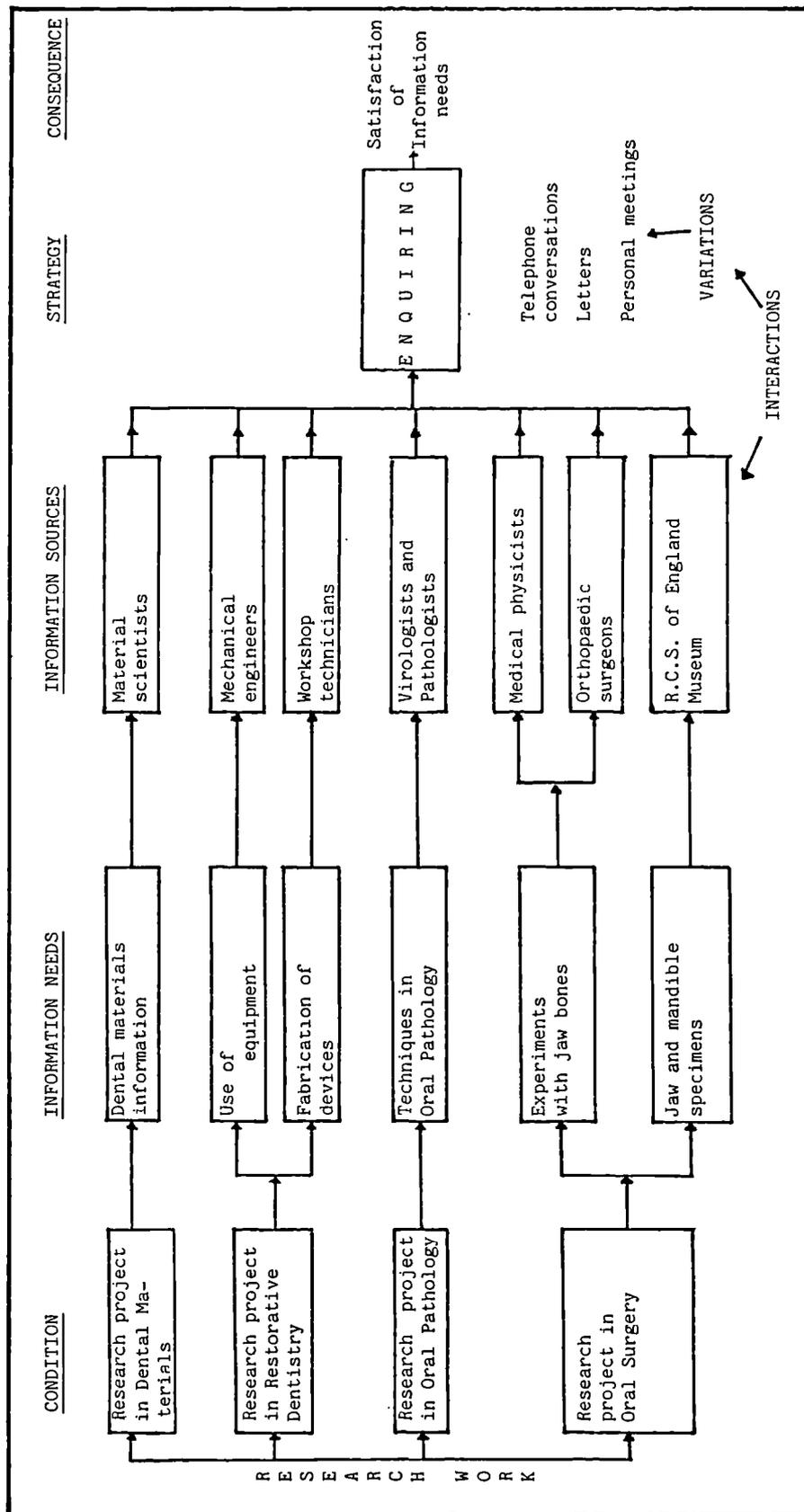
Figure 10.6: Enquiring as a basic strategy to seek information related to research work - Postgraduate students
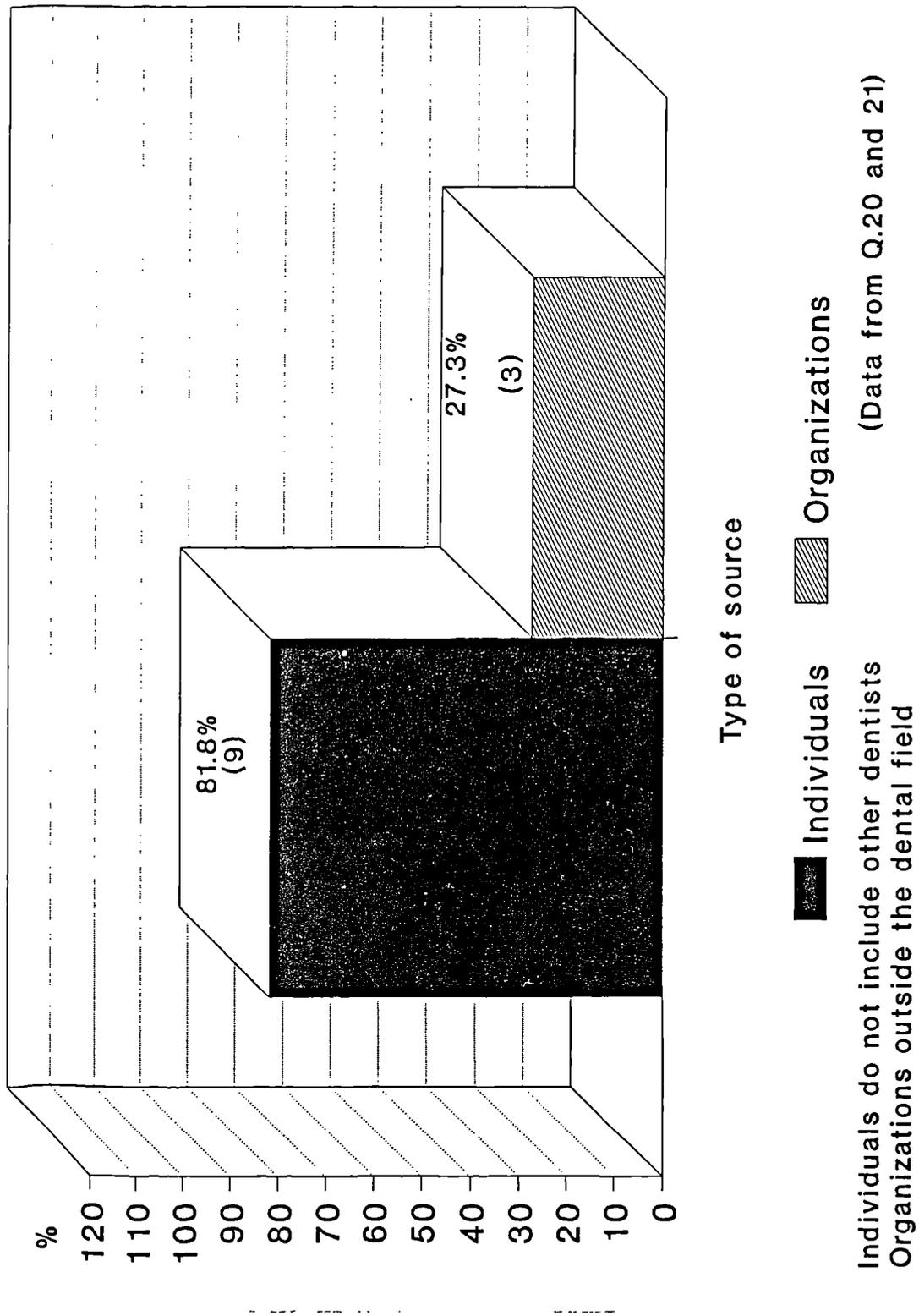
Figure 10.7: Information sources for Enquiring - Postgraduate students
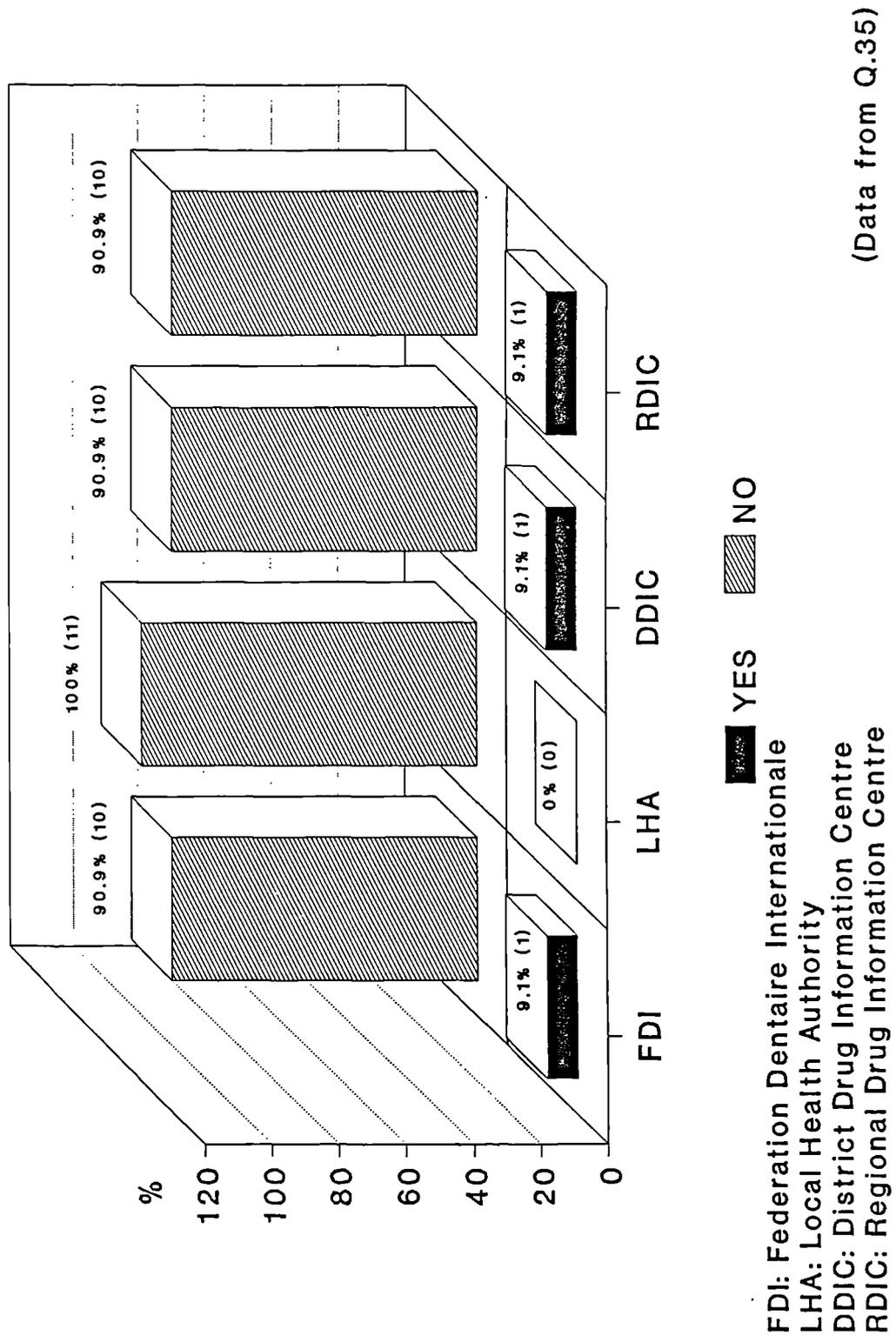
Figure 10.8: Use of information services by postgraduate students

Attending/organizing continuing education events

Postgraduate students only attend continuing education events such as postgraduate courses[6] and they do so either for keeping up-to-date or as a complement to their postgraduate studies (See Figure 10.9).

They attend courses and conferences for keeping up-to-date in any aspect of Dentistry (Int.Nos.2;5;11/Q.15.3 and Int.Nos.2;7;9/Q.16.3) or in their chosen speciality (Int.Nos.1;3;4;6;8;9/Q.15.3;16.3 and Int.Nos.5;10;11/Q.16.3); it depends whether they are already working full-time in one speciality or whether they are still doing general practice. Some continuing education events, for example, the regular meetings of the Oral Pathology Departments from Sheffield, Leeds, Manchester and Liverpool Dental Schools are part of the degree course (Int.Nos.1;6;10/Q.16.3).

The majority of the postgraduate students attends both courses and conferences regularly at least once a year (See Table 10.8). Most of them attend courses anywhere in the U.K. at least during their postgraduate studies. Attendance at conferences is different, almost half of the interviewees (45.4%) would attend conferences anywhere in the U.K. but the other half is divided between those who only attend local meetings and those who only attend these events abroad, either in their own countries or in other countries, but not in the U.K. (See Table 10.9).

Attending... is related to a certain extent with membership of professional associations. As most of the interviewees in this group were overseas students, several of them were members of associations in their own countries, for example *Jordan Dental Association* or *Kenya Dental Association*. On the other hand membership of British associations was very low, for example only four interviewees were members of the *British Dental Association* (See Table 10.10). All these associations are active in organizing courses and conferences and they provide regular information about them to their members. Another way of finding out about these events is by checking the advertisements in the journals of these associations, for example the *British Dental Journal* or *British Journal of Orthodontics* (Int.Nos.1;3;4;5;6;9/Q.13;14.3), so again **Reading** appears related to this strategy. Finally, **Attending...** may be also related to **Enquiring** because many of these events include exhibitions by dental manufacturers and therefore an opportunity to obtain dental product information (Int.No.11/Q.13).

Attending... as in the case of academic staff is a background strategy used mainly for up-dating purposes, but postgraduate students centre their information-seeking behaviour on the use of printed literature and as that is their primary information source, **Reading** and **Using the library** are far more fundamental strategies than **Attending continuing education events**.

Watching

This strategy refers to the use of audiovisual materials. Only 64% of the interviewees use some type of audiovisual aids (See Figure 10.10) and these are mainly slides and videos (See Figure 10.11)

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[6]In this case as in all the other groups in the study, postgraduate courses refer to non-degree courses of any length of time and in any speciality that the interviewees may attend apart from degree courses such as a Master of Dental Surgery or a Ph Degree.
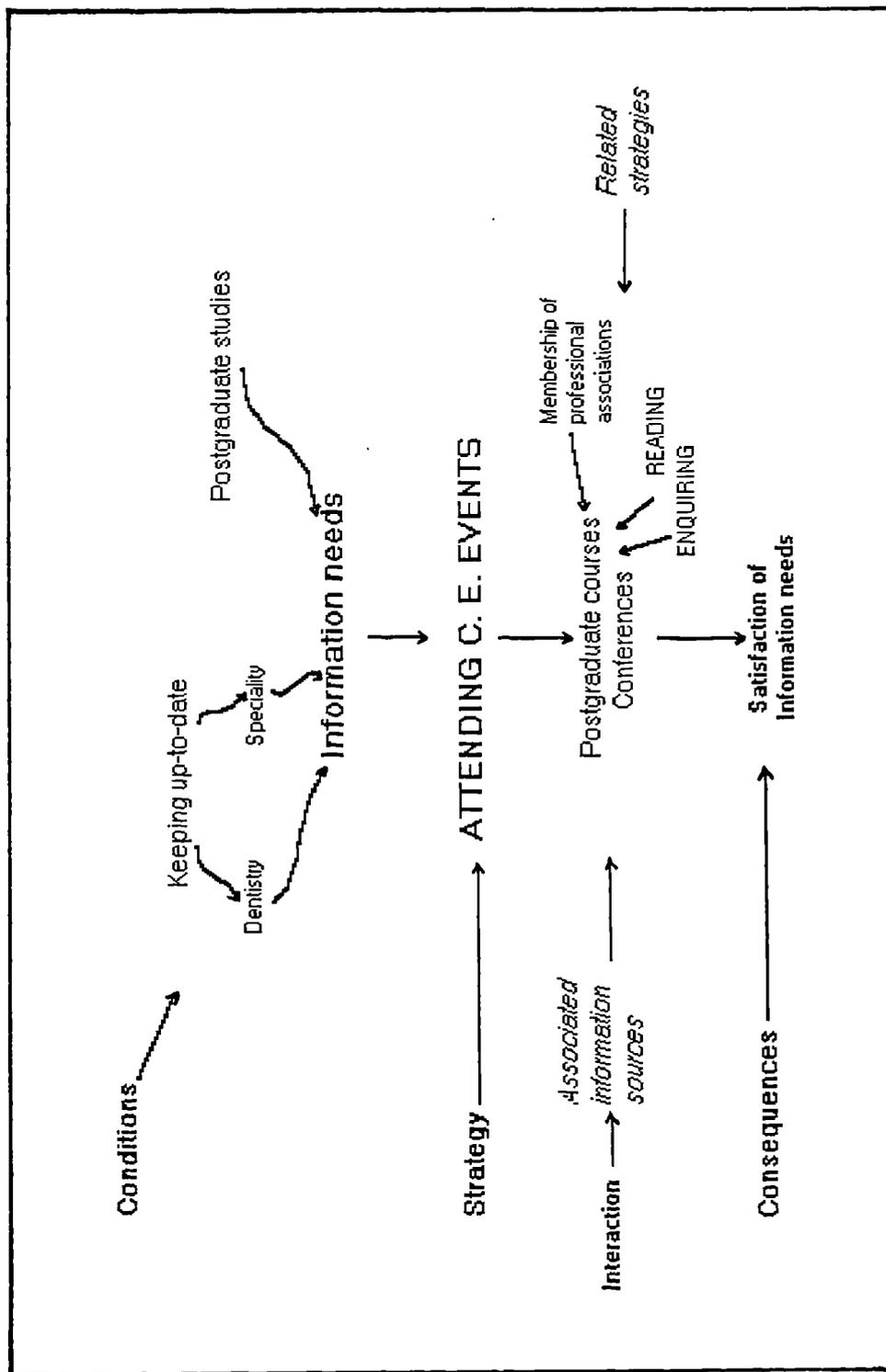
Figure 10.9: **Attending/organizing continuing education events as a basic strategy for postgraduate students**

Table 10.8: **Frequency of attendance at continuing education events**

Event[a]	Non-attendance		Irregular attendance[b]		Regular attendance[c]		Intensive attendance[d]	
	%	()[e]	%	()	%	()	%	()
Courses	9.1	(1)	18.2	(2)	54.5	(6)	18.2	(2)
Conferences	0.0	(0)	18.2	(2)	36.4	(4)	45.4	(5)

[a]Data from Q.15 and 16.
[b]No specific frequency or less than once a year.
[c]At least once or twice a year.
[d]More than twice a year.
[e]Values in () indicate frequencies.

Table 10.9: **Willingness of postgraduate students to travel**

Event[a]	Sheffield[b]		Region[c]		U.K.[d]		Abroad[e]	
	%	()[f]	%	()	%	()	%	()
Courses	10.0	(1)	10.0	(1)	70.0	(7)	10.0	(1)
Conferences	18.2	(2)	9.1	(1)	45.4	(5)	27.3	(3)

[a]Data from Q.15.2 and 16.2.
[b]Attendance at local events only.
[c]Attendance at events in the Trent Region and the North of England, including Glasgow and Edinburgh.
[d]Attendance at events anywhere in the United Kingdom.
[e]Attendance at events abroad only.
[f]Values in () indicate frequencies.

NO 36%

(4)

YES 64%

(7)

(Data from Q.27)
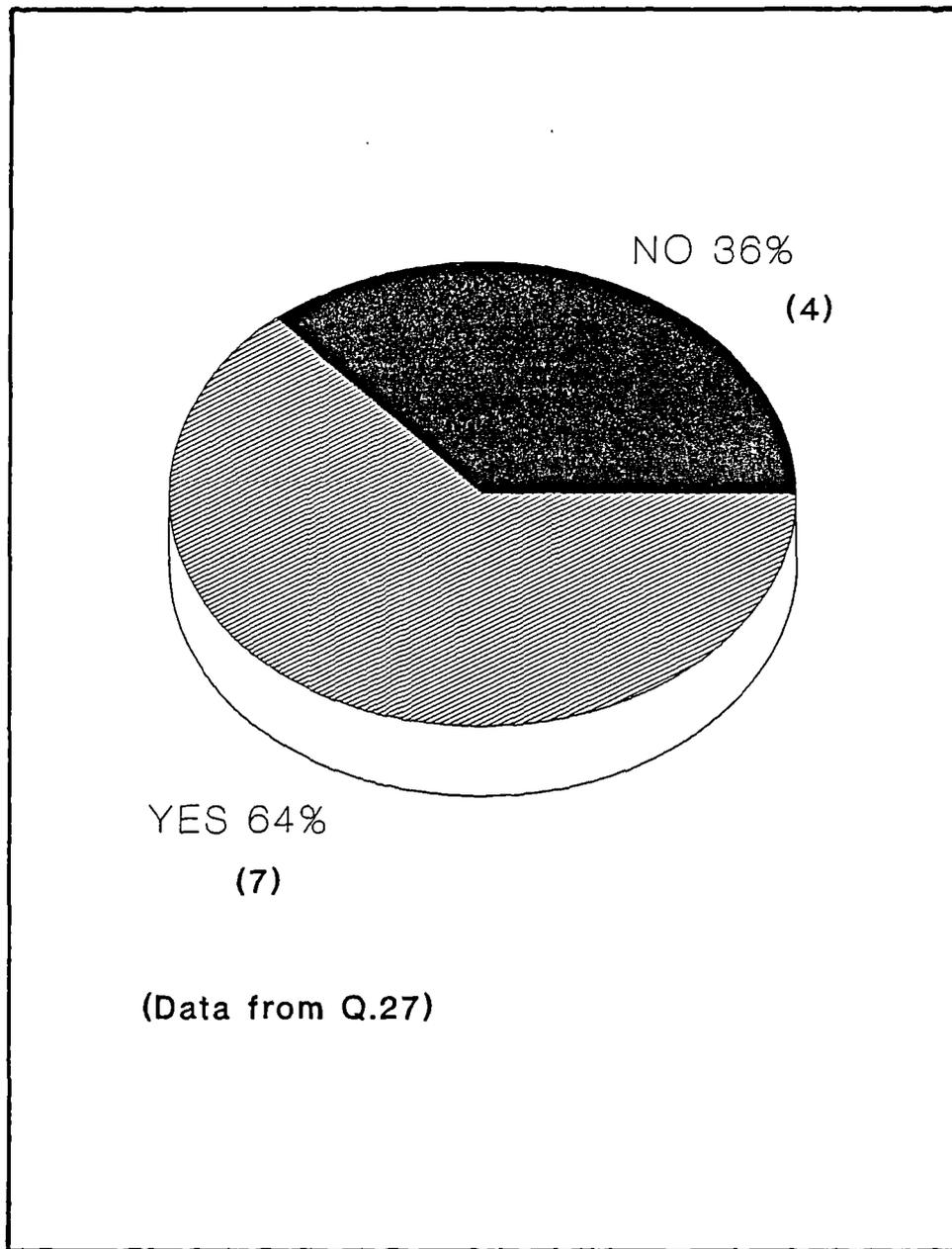
Figure 10.10: Use of audiovisual materials by postgraduate students
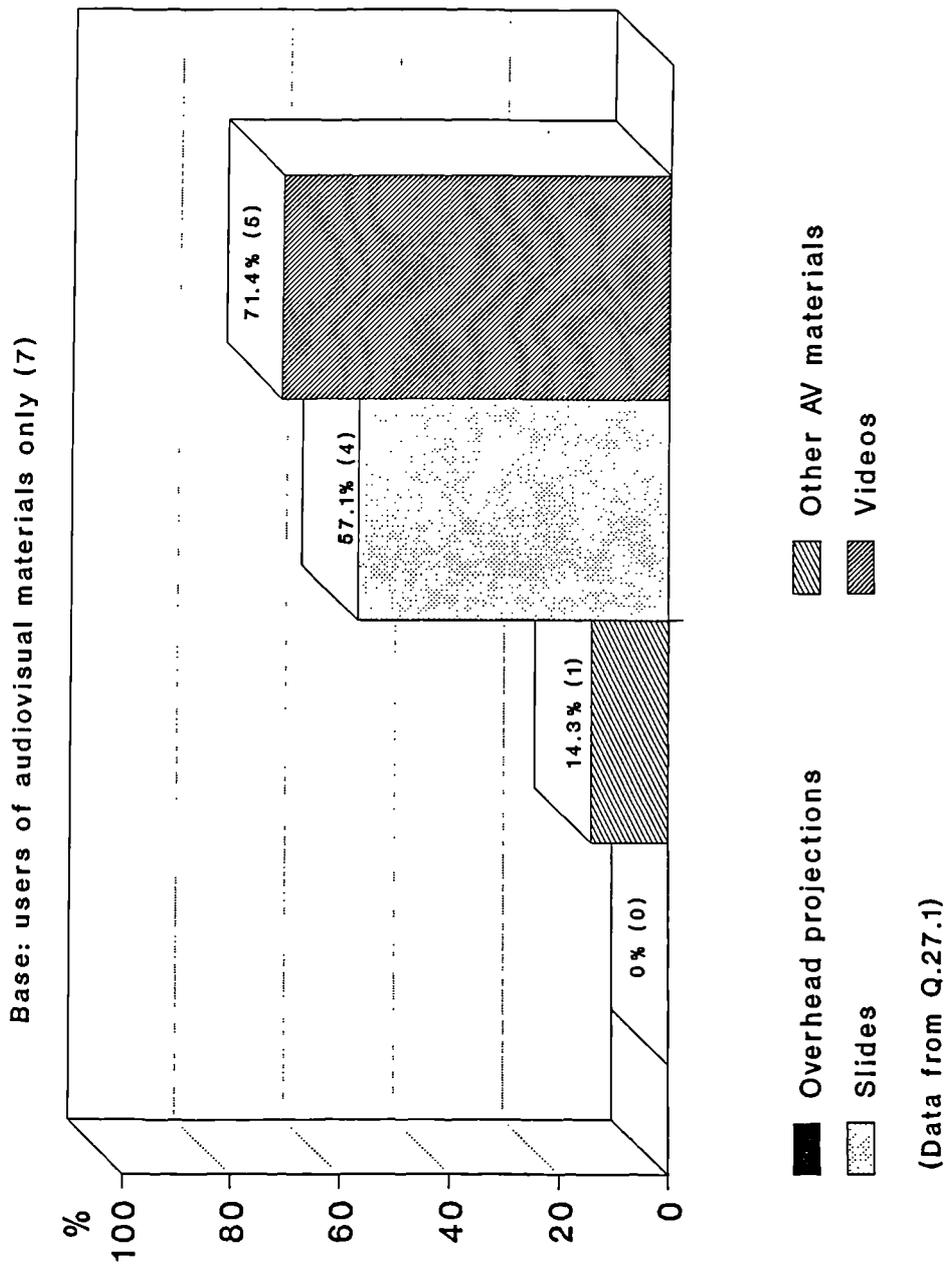
Figure 10.11: Types of audiovisual materials used by postgraduate students

Table 10.10: Membership of professional associations

Associations[a]	PS	
	%	()[b]
American Dental Association	9.1	(1)
British Dental Association	36.4	(4)
British Society for the Study of Orthodontics	36.4	(4)
Dental Association of Athens	9.1	(1)
Federation Dentaire Internationale	9.1	(1)
Greek Dental Association	9.1	(1)
Greek Society of Oral Pathology	9.1	(1)
Jordan Dental Association	9.1	(1)
Kenya Dental Association	9.1	(1)
No membership	18.2	(2)

[a]Data from Q.12.
[b]Values in () indicate frequencies.

Postgraduate students make their own slides, borrow them from the department at the dental school or ask for them to be made by technicians at the dental school. Videos are borrowed from the library or purchased (Int.Nos.2;5-9;11/Q.27.2).

Videos are used for learning techniques in Oral Pathology, Oral Surgery and Orthodontics (Int.Nos.2;5;9;11/Q.27.2). One interviewee was doing research on *Swallowing, Speech and Electropalatography* and she used videos for recording the speech patterns of the patients included in her project (Int.No.6/Q.1;27.1).

Slides are used for collecting examples of interesting cases (Int.Nos.7;8/Q.27.2) or as a complement to lectures (Int.Nos.8;9/Q.78).

Postgraduate students use audiovisual materials to store information and obviously they retrieve information from them at some point. However, they do not perceive **Watching** as a strategy for seeking information; it does not appear in any simple, compound or complex pattern of information-seeking. As in the case of academic staff, **Watching** is not a conscious information-seeking strategy.

Using the library

This strategy constitutes the core of the information-seeking behaviour of postgraduate students. There is a 100% use of libraries in this group and all of them are 'active members' of the University Medical and Dental Library[7]. They seem to use almost exclusively the libraries at Sheffield University, 100% uses the University Medical and Dental Library, and 72.7% uses the Main University Library and other branches like the one at the Northern General Hospital, while only one interviewee has used the library of the British Dental Association (See Figure 10.12). However, this can be considered as a temporary situation while the interviewees were doing their postgraduate studies rather than a constant pattern; most of them left Sheffield at the end of

[7]'Active members' are those with a currently valid library ticket.

their course and some even left the country, therefore they might have started using other libraries.

Postgraduate students may use the library to find information about medical or dental conditions they have to deal with during their clinical training, or about techniques they need to learn. They also use the library for keeping up-to-date, preparing their presentation for the journal club or writing a paper. But above all **Using the library** is a strategy implemented to gather information about their research projects and the literature review that they have to include in their dissertations (Figure 10.13).

This last condition demands a systematic search of bibliography, as a consequence formal literature searches are the variation favoured by postgraduate students:

> *'I look up the "Index to Dental Literature", take the references and find the journal'* [The respondent usually photocopies the articles; he finds most articles at the library; if they are not there, he borrows them from his supervisor.] (Int.No.3/Q.33);

> *R: First time I wanted to find the references of the topic I wanted to write about.*
> *I: What did you do?*
> *R: I went to the library and looked in the index and I collected the material.*
> *I: In which index did you look?*
> *R: The Medical and the Dental.*
> *I: "Index Medicus" and "Index to Dental Literature"?*
> *R: Yes.*
> *I: Then what did you do? ... Did you look into the index by subject or by author?*
> *R: By subject ...*
> *I: And then?*
> *R: I found the references, then I looked for the papers.*
> *I: The articles?*
> *R: Yes.*
> *I: Did you take a photocopy?*
> *R: Yes.*
> *I: Did you find all the articles at the library?*
> *R: Some yes, some not.*
> *I: What did you do?*
> *R: I asked for them.*
> *I: Did you ask an interlibrary loan?*
> *R: Yes.*
> (Int.No.5/Q.33);

> *R: ... Firstly, I normally look some books from the index, if I want to find some articles and I write down* [the references].
> *I: Which index?*
> *R: "Index Medicus". I find the journals. Then I read them if I think they are worth, I make a photocopy. But if I know the article, exactly what journal and what year, I go directly to read it.* (Int.No.10/Q.33);
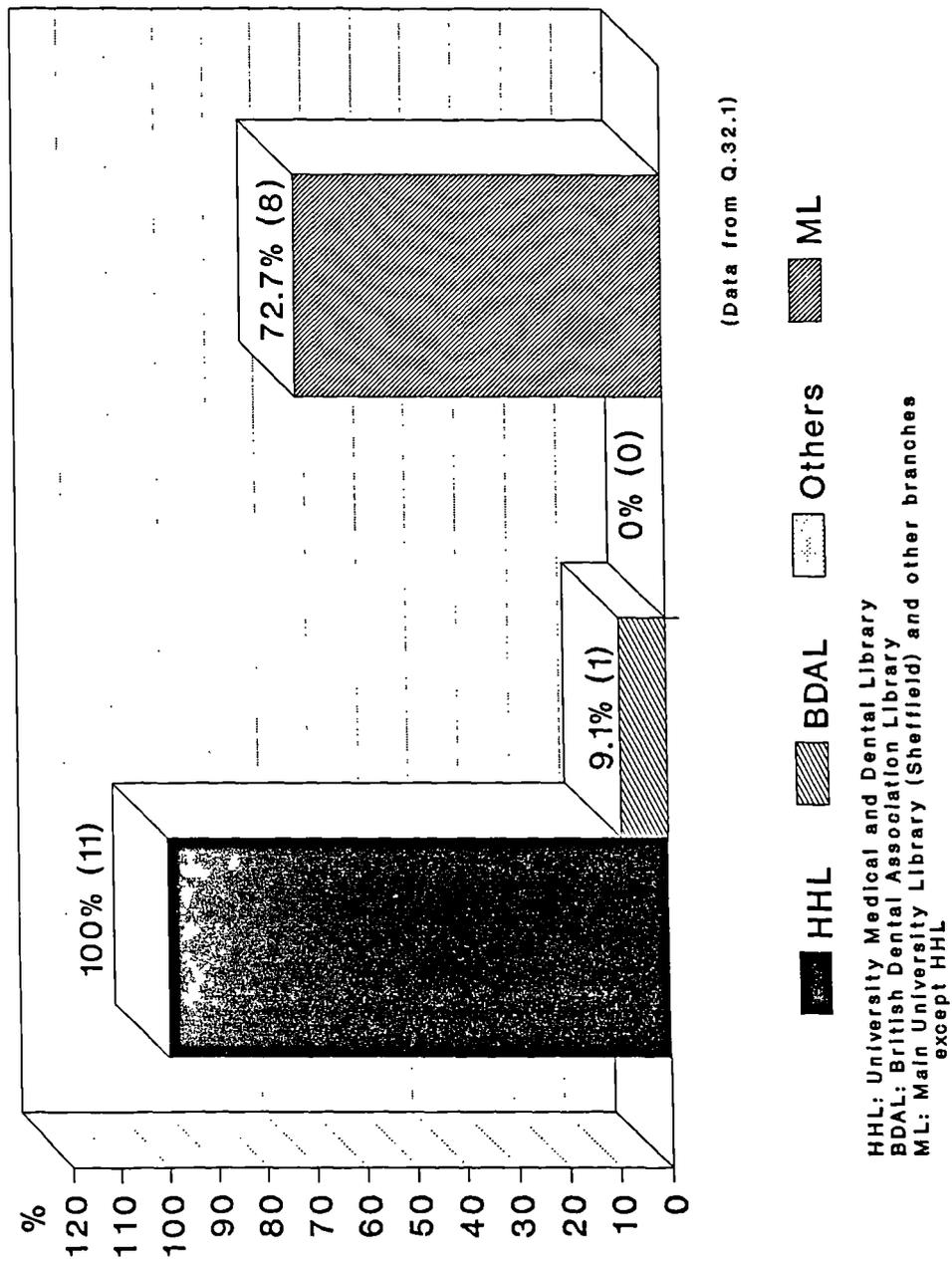
Figure 10.12: Libraries used by postgraduate students
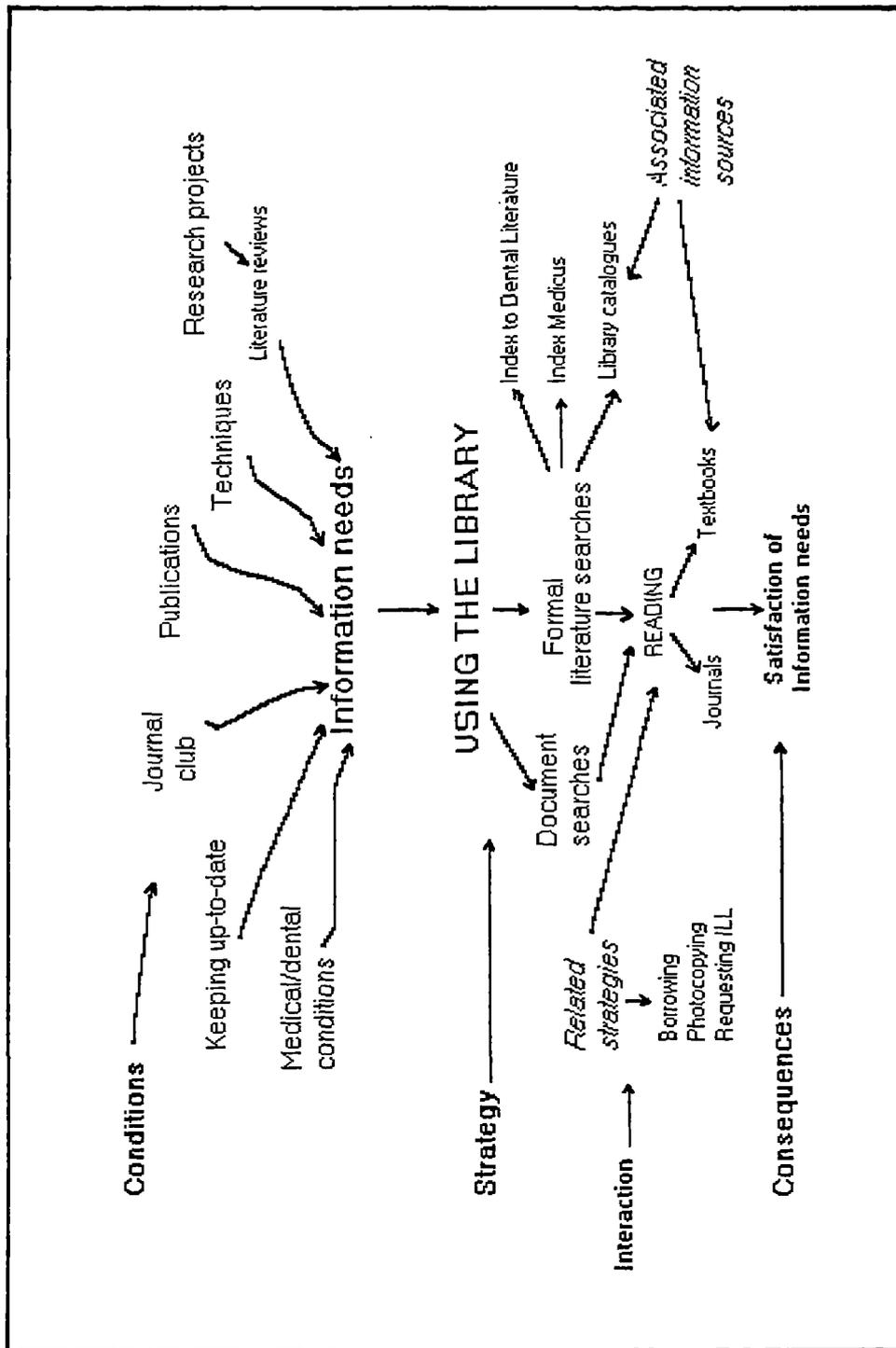
Figure 10.13: Using the library as a basic strategy for postgraduate students

R: When you read about a relevant literature topic, then you need a search.
You look at the microfiche catalogue; if it is not there you ask the librarian
for an interlibrary loan; if it is there you borrow and photocopy.
I: Do you use the subject or the author catalogue?
R: It depends, maybe both.
I: Do you use the library's photocopying service?
R: Yes.
(Int.No.11/Q.33).

These literature searches are always subject searches, done manually in the *Index to Dental Literature*, the *Index Medicus* or the library catalogues in microfiche form. The pattern is always the same, they look under subject headings relevant to their topic, write down the references, check whether the journals are in the library and find the articles. They generally photocopy the papers that they find. Sometimes they may go to the Main University Library to consult journals published before 1975, but most of the time they use the University Medical and Dental Library near the Dental School. If a journal is not kept there, they request interlibrary loans (Int.Nos.1;3;4;5;;8;10;11/Q.33).

Another variation of **Using the library** is document searches:

R: I went [to the University Medical and Dental Library] *I tried to find in the catalogue if they had the journal I was interested in. Then I looked to find it,* [She looked for the journal] *found the article, photocopied the article and I left.*
I: Did you use the photocopying machine of the library?
R: Yes.
(Int.No.2/Q.33);

'I knew what I was going to get and I knew where the books were. A book of journals of the "American Journal of Orthodontics". I took it, went to the desk, filled in the form, and I just took it for one or two hours, photocopied and went back again' (Int.No.6/Q.33);

R: When I go to the library I go for literature... for journals.
I: Do you go straight on to the shelves?
R: Yes, I do because I've already known what I want.
I: And then?
R: Sometimes we go to the microfiches [microfiche catalogue].
I: And then?
R: For me nothing because I haven't used it [the microfiche catalogue].
I: When you find the journal, what do you do?
R: I photocopy everything.
(Int.No.9/Q.33);

in these cases they know the specific document that they are looking for, because the document has been identified by a previous search or by reading another article.

Postgraduate students have very definite topics to look for and they do not browse the literature at random to discover something interesting. They accept the routine of manual searches in the *Index to Dental Literature* or the *Index Medicus* despite the fact

that these searches are time consuming. They find the *Index to Dental Literature* easy to use (Int.Nos.1;2;3;4;6;8;10/Q.40) once they have worked out the relevant subject headings and their only complaint is related to the indexing language:

> *'Sometimes, I have some problems with the classification of the subjects. Sometimes I don't know under which term I must look for the subject I am interested in'* (Int.No.2/Q.40.1).

Only one interviewee, who did not know how to do a literature search (Int.No.7/ Q.39),had requested a Medline search. Another had done so at a hospital where she was working before coming to Sheffield (Int.No.1/Q.44.1). But the interviewees were not aware that the library offered an on-line literature search service that could have saved them the tedious copying of references from the indexes (See Table 10.11).

Using the library is likely to be an initial strategy for seeking any kind of information:

> *'For everything I need. Occasionally I might see one of the consultants for an easy answer or guidance but usually you seek information at the library first, to discuss with the consultant'* (Int.No.1/Q.10);

for keeping up-to-date because:

> *'Everything is in the library, textbooks ... journals'* (Int.No.9/Q.11);

or because of their research work:

> *'Because the library collects books and journals... most of the journals ... I don't think we can find another place instead of the library'* (Int.No.10/Q.11);

the common link is that the library is regarded as the most comprehensive source of information, as a consequence it will provide the information that they are looking for, and that information is always in printed form.

Despite the importance of Using the library as an information-seeking strategy, library use is rather traditional within this group; formal literature searches are always manual, limited to the library catalogue or the two relevant printed current bibliographies: *Index to Dental Literature* and *Index Medicus*. Only one interviewee (Int.No.10/Q.9) mentioned the current awareness service of the University Medical and Dental Library and none of them mentioned other information sources such as the *Science Citation Index* or *Current Contents*. The fact that postgraduate students centre their information-seeking behaviour on this strategy does not necessarily imply that they are skilled library users.

10.3.2   Patterns of information-seeking behaviour

Postgraduate students in full-time education have a set of conditions for information needs pre-established by their course activities. These conditions are limited to academic work: clinical training, course work, research projects, publications. Another characteristic of these conditions is that most of the time they require information in printed form. The predominance of printed literature as information source provokes the predominance of two strategies: Reading and Using the library, where the

Table 10.11: Formal literature searches

Source[a]	YES		NO	
	%	()[b]	%	()
Index to Dental Literature	72.7	(8)[c]	27.3	(3)
On-line databases	18.2	(2)[d]	81.8	(9)

[a]Data from Q.38 and 41.
[b]Values in () indicate frequencies
[c]Interviewees have used the "Index to Dental Literature" at least once during the last five years.
[d]Interviewees have requested at least one on-line search during the last 10 years.

former is the logical continuation of the latter (See Figures 10.14 and 10.15). Post-graduate students usually obtain most of the journals and textbooks that they read from the library; personal collections do not have an important role in the information-seeking behaviour of this group[8].

Most of the interviewees have described simple patterns (Int.No.1/Q.75-76; Int.Nos.2;3;5;6;8;9;11/Q.1):

> R: I needed information for my reviews of the literature, for my project and my dissertation.
> I: What did you do?
> R: I had to find articles from dental journals and to read some books.
> I: How did you find these articles and books?
> R: I have to go to several libraries to look for them.
> I: How did you know which articles and which books to look for?
> R: I had to look at the catalogue at the library and I had information from previous articles, their references.
> I: Wich was the subject of this particular review?
> R: The last one was about "mast cells".
> I: And your project for the dissertation...?
> R: ... [it] will be something similar.
> I: You told me that you went to several libraries. Which libraries?
> R: The hospital library [University Medical and Dental Library], the University Main Library and I asked some articles from other libraries.
> I: From interlibrary loan?
> R: Yes.
> I: You told me that you look at the catalogue and that you had references from previous articles. After that what else did you do?
> R: Either to find the journal that was concerning my review and had the article I was looking for or to ask through the interlibrary loan.
> I: When you found the article at the library what did you do?
> R: Photocopy of the article.
> (Int.No.2/Q.1);

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[8]See Reading page 276.
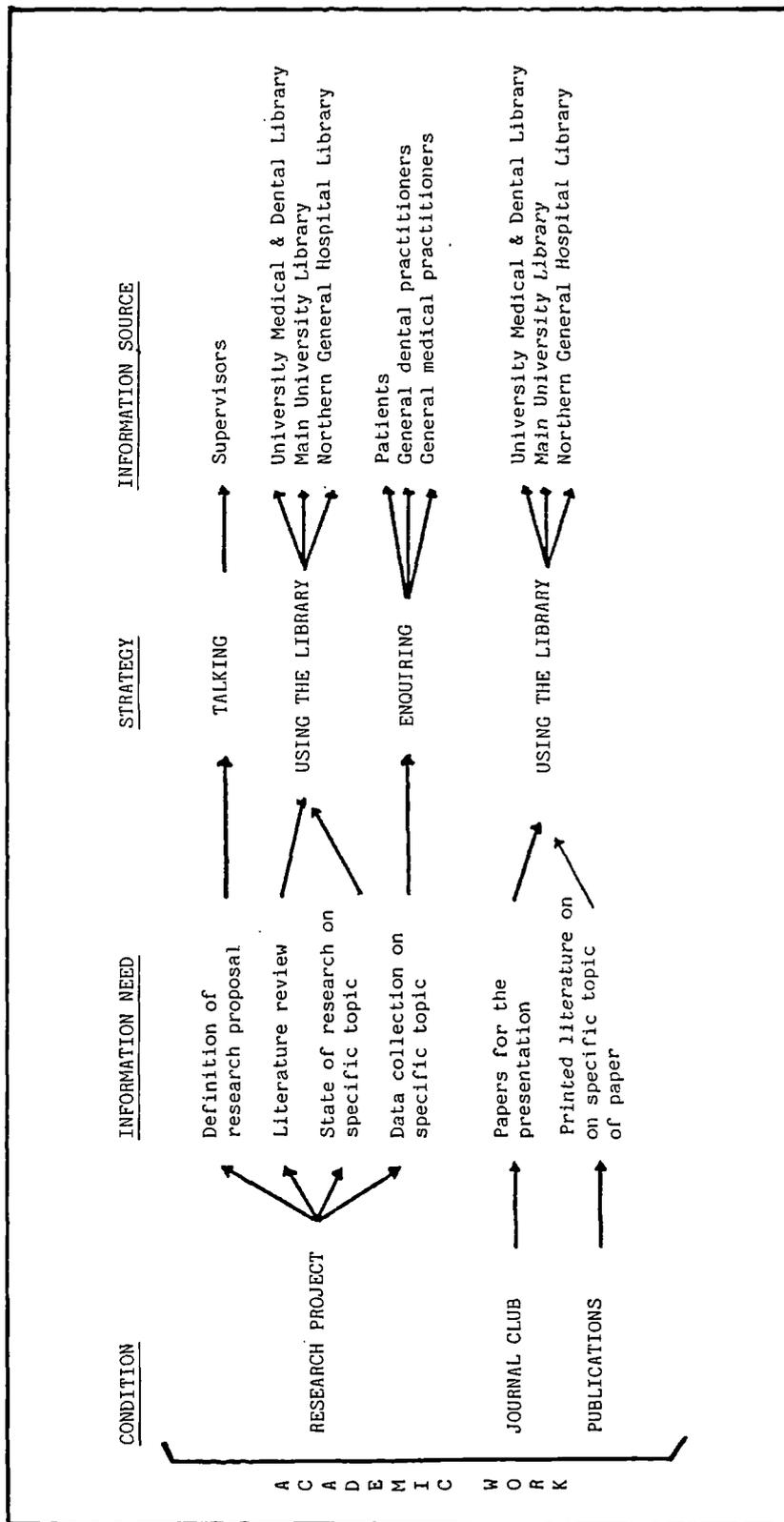
Figure 10.14: Simple patterns - Postgraduate students
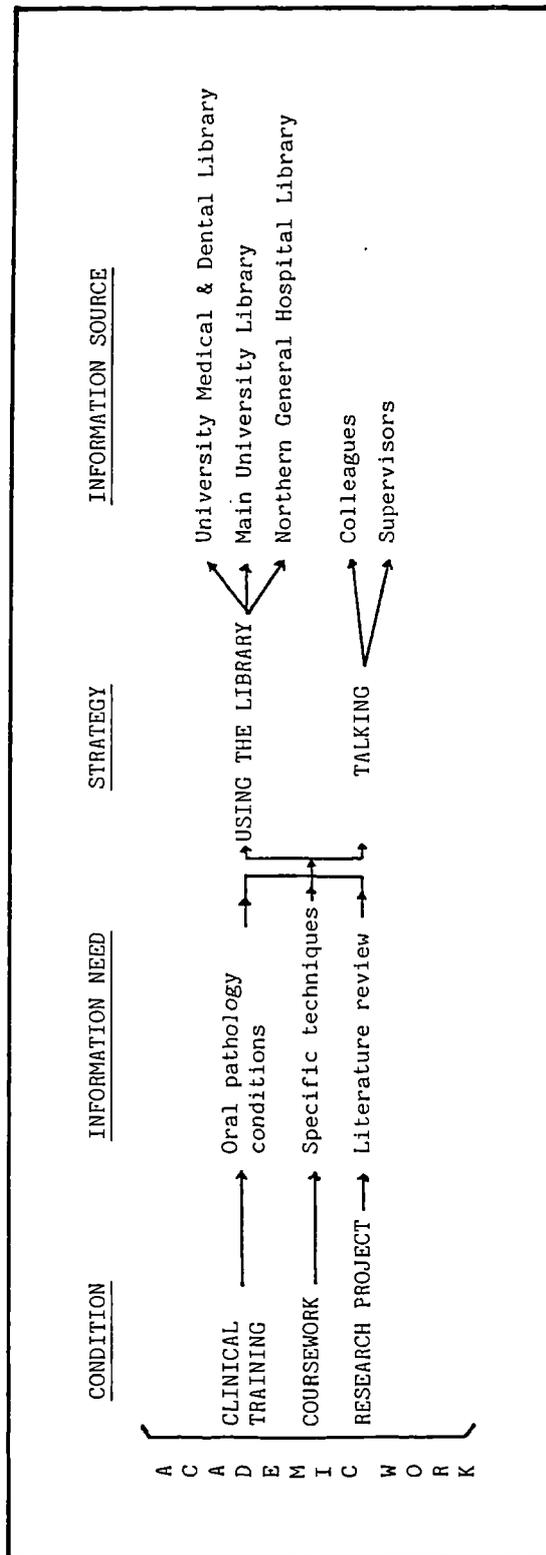
Figure 10.15: Combined patterns - Postgraduate students

R: I needed to collect some literature for my research?

I: On which subject?

R: "Swallowing, Speech and Electropalatography".

I: How did you search for this information?

R: I went to the library. They have the microfiches ... system...

I: Microfiche catalogue?

R: Yes, the microfiche catalogue.

I: How did you search the microfiche catalogue?

R: There are certain microfiches for ... subjects.

I: Then?

R: I gave up that system because it took longer... They have index books, the Index Medical ["Index Medicus"] *because swallowing is also a subject for Medicine, I checked both.*

R: So you checked the "Index Medicus" and the "Index to Dental Literature".

R: Yes.

I: And then?

R: I've done the last 15 years. I made a list and in a period of two or three weeks time I collected all the papers, photocopying them. For the period before 15 years I had to look at the backpages of my papers ... journals... for example at the end of one of the articles they give the literature references, I had to look at that. Then ... found them ... Most of them are kept in the Main Library. I go there and I haven't finished, I cannot carry more than two or three books.

(Int.No.6/Q.1);

R: When you want to review patients after operations.

I: Exactly what kind of information do you need?

R: What is bothering them regarding their dental problems, their oral surgical problems.

I: How do you obtain the information?

R: You send questionnaires to patients when you want to do broad studies on certain diseases, for example "cancer of the tongue". [They send questionnaires to patients who had cancer of the tongue or who are supposed to suffer from it; these questionnaires are sent by post, in person, to patients coming for routine treatment, to general practitioners and general dental practitioners who have referred patients].

(Int.No.11/Q.1);

Using the library and **Enquiring** are both adequate strategies for two different stages of the research: the literature review and data collection respectively. So one reason for this predominance of simple patterns is that postgraduate students perceive their information needs in terms of the particular stage of their research. Another reason for this predominance is that they need most of the time printed literature, therefore **Using the library** is the only alternative to find it:

R: I am doing an MSc at the moment so I continually need information.

I: Could you choose one example?

R: We have a weekly journal club and I have to look up references for that.

I: How do you look for these references?
R: At every meeting of the journal club there will be a particular article so
I look up at the library and look for relevant references about that.
I: How did you find out these relevant references?
R: Usually references at the back of the article. [...]
(Int.No.3/Q.1).

However, there are other reasons for this predominance of simple patterns:
i) Lack of ability to describe how information is sought, for example Int.No.5 described this initial situation:

R: When I need some journals from the library to read on certain topics.
I: Which topics?
R: Oral Pathology.
I: Are you referring to the journal?
R: Yes.
I: I am asking you about the topics.
R: Topics in Oral Pathology; new dental findings, trying to update myself
... to update my standard of knowledge.
I: Which journals do you look for?
R: "Journal of Oral Pathology", "Update" ...
I: It's "Dental Update" isn't it?
R: I think so, "British Dental Journal".
I: How do you get these journals?
R: From the library.
I: The library at the Royal Hallamshire Hospital? [9]
R: Yes, or the one at the department.
(Int.No.5/Q.1);

the respondent obviously reads journals for keeping up-to-date, but he is not able to say which (Int.No.5/Q.23); out of the three examples that we find in his reply above, two *(Dental Update* and *British Dental Journal)* are general dental journals that cannot provide up-dating in Oral Pathology at specialist level. Also the respondent keeps up-to-date by attending conferences and meetings on Oral Pathology (Int.No.5/Q.16), but the two strategies are described separately at different moments of the interview. This interviewee is just one who shows a common characteristic in this group, i.e. they very seldom refer to more than one strategy at a time, **Using the library, Reading, Attending conferences,** etc. are all described as separate actions.

ii) Lack of ability to seek information autonomously, for example Int.No.9 has described this initial situation:

R: ... For example information about my project.
I: Which information did you need?
R: Information about the kind of project that I am going to do.
I: How did you look for the information? [Respondent could not answer, the question was repeated in a different way].
I: What did you do in order to find information?

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[9]The University Medical and Dental Library.

R: With the professor.
I: So you talked to the professor.
R: Yes, he is the nearest I can ask, the only one.
I: What did you ask him?
R: I asked him what kind of project I [could] do, I am going to do.
I: Did he give you any information or did he refer you to look for information somewhere else?
R: No, he did not give any information. We have made an appointment...
I: Do you have any idea of what your project is going to be?
R: No idea.
I: So your project is not defined...
R: No.
I: Have you tried to find information for your project in any other way?
R: No, because you are connected to the professor, any other information is useless.
(Int.No.9/Q.1);

the respondent cannot decide the sort of project that he wants to do, he is relying entirely on advice from a senior member of the department and seeking information by himself is senseless in his opinion. This reply is consistent with his replies describing the use of the library (Q.33;38;41); he looks for documents whose references he has already obtained, but he does not know how to make a formal literature search[10].

iii) Lack of ability to express in English: eight out of eleven interviewees spoke English as a second language. Firstly they had vocabulary problems, i.e. they did not know the meaning of certain words used in the questionnaire, for example Int.No.2 did not know the meaning of words like *issues, subscribe, facility,* etc. They also failed to understand whole questions, as we can see in the transcription of Int.No.9/Q.1 above. Secondly and as a consequence of the first problem, they found it difficult to express themselves in English; specifically they found it difficult to give precise and detailed answers. The latter is closely related to their lack of ability to describe the ways in which they seek information.

The only combined pattern described by this group shows **Using the library** complemented by **Talking** (See Figure 10.15) It is implemented: i) to learn about oral pathology conditions, for example, Int.No.1 looks for journals and textbooks in the library to support the diagnosis of the biopses that she carries out every week and she complements that by discussing the results with other fellow postgraduate students (Int.No.1/Q.1);
ii) to learn about specific techniques, for example, Int.No.4 needs to know which specific orthodontic technique she will use for each case and again she combines looking for journals and books in the library and asking for advice from other colleagues in the department (Int.No.4/Q.1);
iii) to start a research project, for example:

R: I need some information mostly from the library ... and ... I need some information about my research, for my subject research.
I: Your research is on ...?

---

[10]See Int.No.9/Q.33 page 297.

R: "HPV [human papilloma virus] *and oral cancer"*

I: How did you get that information?

R: Firstly I got the list of some articles from my supervisor. I found the articles at the medical library. And I found some index book. I think it's called "Index Medicus".

I: "Index to Dental Literature?

R: No, not that one ... [Respondent hesitates a lot, and seems very confused and eventually he confirms that he has used the "Index Medicus" only].

I: So you looked up the "Index Medicus"?

R: Yes, actually mainly information is from that book, from that index.

I: How did you look at the "Index Medicus"?

R: For subjects, I searched for subjects. Sometimes I search for authors but mostly for subjects.

I: Then?

R: Later on I found the journals and made copies.

I: So you photocopied the articles.

R: Yes.

(Int.No.10/Q.1).

Using the library remains as the key strategy, since the information they need s eventually in printed form.

Postgraduate students have not described actual complex patterns. Although they nplement the six basic strategies **Reading, Talking, Enquiring, Attending...,** Vatching and **Using the library,** these strategies never appear integrated in a mgle sequence. This is partly because **Using the library** is so dominant a strategy for this group that all the other strategies become overshadowed and partly because this particular group of interviewees could describe neither in detail nor with precision the way in which they sought information.

Chapter 11

The use of information by dental professionals

11.1 The dental professionals

The 110 dentists who took part in the study represented an 80.3% response rate. They were general dental practitioners (39), hospital staff (25), community service dentists (15), academic staff (20) and postgraduate students (11). The response rates of each subgroup were 68.4% general dental practitioners, 86.2% hospital staff, 100% community service dentists, 83.3% academic staff and 91.7% postgraduate students. Both the overall response rate and the specific response rates of each subgroup were higher than those of previous user studies in Dentistry (See Table 4.1). The interview approach and the time span to carry out the interviews (12 months) contributed to these results.

The general dental practitioners were principals, partners or associates in dental practices in Sheffield that provided full NHS treatment. They were not involved in research or teaching activities; as a consequence they did not publish papers or make presentations at conferences or congresses. Their main subject interest was Restorative Dentistry, the speciality closely related to their everyday work.

The hospital staff worked full-time or part-time at the Charles Clifford Dental Hospital in Sheffield; those dentists who worked part-time there, had full-time positions at general hospitals in the Trent Health Region. Clinical work was the core of the hospital dentists' job but some did a certain amount of teaching and publishing and even some research. Their subject interests covered all dental specialities.

The community service dentists worked for the Sheffield Community Dental Service. They were a small group full of contrasts. They worked part-time or full-time, doing general dentistry or specialist work, at one clinic or several ones. They treated children, handicapped and elderly people and they carried out dental screenings of school population. Their subject interests were Orthodontics, Children's Dentistry and Epidemiology.

The academic staff worked at the School of Clinical Dentistry, University of Sheffield. Their main activities were lecturing, supervision of undergraduate and postgraduate dental students, and their own research projects. Clinical work (i.e. treating patients) at the dental hospital was a complement to the former. Their subject interests covered all dental specialities.

The postgraduate students were registered full-time for a master or a doctoral de-

gree at the School of Clinical Dentistry of Sheffield University. They were a group of dentists with study and research commitments only and represented quite an exceptional situation in the dental profession, because not even academic staff were full-time researchers. Their subject interests were Oral Pathology, Orthodontics, Dental Materials and Oral and Maxillo-Facial Surgery.

Some groups of dental professionals were not represented in the study. Dentists working exclusively in private practice was one of them, because at the time of the interviews only one purely private practice was identified in Sheffield. Dentists working in the Armed Forces and dentists working in industry were not included as well. The former because access to defence institutions was not considered feasible and the second one because it was estimated as a very small group at national level.

General dental practitioners working in solo practices were underrepresented because 72% (8) of the sampled individuals did not accept an interview. Similarly academic staff doing Oral and Maxillo-Facial Surgery were underrepresented to some extent because three out of four refusals for the whole subgroup happened to be oral and maxillo-facial surgeons.

However, despite these exceptions the actual group of interviewees represented all professional ages from young graduates to those near retirement time, all professional status from junior staff to owners of large practices, professors and consultants, and all dental specialities. It also included people working part-time and full-time, in one or several sites, and doing full-time or part-time postgraduate studies. In that sense the interviewees are representative of the profession as a whole and the description of their information-seeking behaviour can provide an explanation of the information-seeking behaviour of dental professionals in general. Each of the subgroups in the study: *general dental practitioners, hospital staff, community service dentists, academic staff, postgraduate students* represents a main style of professional practice in Dentistry and because all of them practise in one single geographic area they share the same information resources, at least in theory. Then it is possible to compare the ways in which these resources are used.

11.2 The conditions for their information needs

11.2.1 General characteristics

The dental professionals have described a set of conditions that reveals a general pattern for the profession as a whole and specific patterns for each individual group; the specific patterns and the general one are consistent with each other.

The conditions that provoke seeking information are created by their clinical or academic tasks. The clinical work covers three aspects: diagnosis of patients, treatment of patients and delivery of dentistry. The academic work includes teaching and lecturing, research and postgraduate studies, publications and management of dental education.

Each group has a different combination of tasks and this variation determines the variation in the scope of their information needs. General dental practitioners have exclusively described situations related to their clinical work. On the other hand, postgraduate students have only described situations related to their course and research projects. Hospital staff, community service dentists and academic staff, all

three groups have clinical and academic commitments. They have described different sets of conditions that reflect which tasks are the most important and therefore which tasks are the most likely to require seeking information.

Hospital staff have to deal with a wide variety of cases from routine ones to very serious or rare conditions and this aspect of their job is their main reason for seeking information either about a particular patient or the medical/dental condition a patient is suffering from. They also need information for preparing publications, carrying out research and managing hospital services. The scope of their information needs is the largest of any single group in the study, because hospital work is a mixture of clinical, academic and management tasks where no single task appear as the exclusive one.

Community service dentists need mostly clinical, social and family information about patients, as well as information about rare or serious medical conditions affecting their patients. Regarding dental screenings of school populations, they need data from school records, practical information for organizing the screening schedules and technical information for designing epidemiological surveys.

Academic staff have a varied pattern of tasks but the emphasis is decidedly on the academic side. Research work and the preparation of papers are their main reasons for seeking information. These tasks demand extensive use of printed literature; the dominance of this information source determines their perception of information and information needs. Academic staff tend to identify information with printed literature and they perceive information needs as those satisfied by that information source.

11.2.2 The nature of their information needs

Dental professionals need basically three types of information: **patients' information, management information** and **scientific information**. These three types of information are produced, organized and stored independently.

Patients' information is the information that describes the present and past medical/dental condition of the patient. It includes the patient's reason for calling on the dentist, the medical/dental history of the patient, treatment received by the patient in the past, and medication that s/he may be currently taking. Also, it includes the reason for referral and tests' results. In some cases, for example children, handicapped and elderly patients, it covers social and family background information as well. All this information is recorded and kept in the patient's file.

Patients' files are mainly handwritten documents. Formats may vary from practice to practice, from institution to institution. The contents of these files, except for tests' results, are personal notes made by the practitioner using his/her own criterium to decide how much or how little it is necessary to record. Another important characteristic is that medical and dental histories are kept separately. While medical practitioners may not need the dental histories of their patients, that is not the case with dental practitioners who routinely enquiry about the medical history of their patients. An even more important characteristic is that these files are confidential and keeping this confidentiality is part of the professional code of conduct.

Management information is information about the organization, availability, costs, performance and evaluation of dental services. It includes official regulations for dental treatment, health and safety regulations and the conditions of contract between dental practices and the health authority. Unlike **patients' information**, it is not condensed in a single document. It is scattered in government documents, internal

reports, official circulars, etc. Since most of this information is expressed in quantitative form (for example number and type of referrals, number of clinical sessions, number of screened children per programme, etc.) standardization for recording and storing that information is possible. In fact, the Körner's reports have established the minimum data sets for describing activities, manpower resources and finances in the National Health Service; the seventh of these reports is devoted especifically to hospital and community dental services[1].

Management information is defined and controlled by health managers and although it is not strictly confidential, access is not always easy.

Scientific information is information about medical/dental conditions, techniques, drugs, materials, products and equipment. It refers to Dentistry as a field of knowledge, and to other related disciplines, mainly Medicine. It is published mostly in printed form: books, journals, reports, magazines. But it is also dissiminated through oral communication channels, for example lectures, conferences, case presentations, product presentations, etc. As printed literature, it is organized and stored for retrieval purposes in data bases, printed bibliographies and libraries. Access is possible through several routes: personal subscription to a journal or attendance at a lecture, borrowing books from the library or searching a data base.

Scientific information pervades the overall conception of information and information seeking of dental professionals, especially academic staff and postgraduate students, who on the other hand are their main producers.

Patients' information, management information and scientific information are the by-products of three different activities carried out by dental professionals: patients' treatment, management of dental services and research respectively. As these three types of information are produced at different instances, the tendency has been to manage each of them independently. **Patients' information** due to its confidentiality is exclusively controlled by the dental professionals themselves, **management information** is increasingly controlled by health managers, and **scientific information** has been traditionally controlled by libraries for storing and retrieval purposes. Dental professionals, health managers and librarians all three are undoubtedly information experts in their respective areas, but in everyday life dental professionals are the ones who need to use these three types of information for carrying out their clinical tasks. A single situation such as a medically compromised patient may require to find out the complete medical history of the patient (**patients' information**), to decide a referral for which **management information** is necessary and to read about the particular medical condition of the patient (**scientific information**). The fact that these three types of information are produced independently and stored separately does not mean that they are always used in the same fragmented way.

However, the strong feelings of health professionals –not only dentists– about the confidentiality of patients' files, the government perception of information systems for the NHS centred exclusively on planning and management, and traditional library services that are system-oriented rather than user-oriented are all powerful factors maintaining this fragmentation.

The lack of effective integration of **patients' information, management information and scientific information** is the major information problem of dental professionals. This problem has not been directly defined as such by them, but it

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[1]DENTAL SERVICES STATISTICS GROUP (1987).

emerges from the characterization of their information needs and the specific information problems each group has described.

Dental professionals doing mainly clinical work, such as general dental practitioners, hospital staff and community service dentists have described the commonest problems regarding the use of **patients' information**. Treating patients presents two basic information needs: i) eliciting the patient's reason for calling on the dentist; ii) finding and keeping an accurate medical history. In the first case, the interaction between patient and dentist is the main seeking strategy. The dentist's communication skills are the key factor in solving the problems, and external intervention in the form of an information service is not possible. In the second case, patients themselves are one possible information source, but the most reliable information can be supplied by the medical file or the medical practitioner dealing with the patient. Medical and dental files are kept separately, since medical and dental treatment are provided in the same way. Unless a patient is formally referred for dental treatment, no medical information is directly available to the dental practitioner; and letters of referral may not contain all the necessary information, as hospital staff have especially pointed out. There is no direct access to patients' medical files, unless it is formally requested by letter, or in more urgent cases the information is sought by speaking over the telephone with the medical practitioner. If patients' files (both medical and dental) were in electronic form, access and transference of information would be facilitated. Medical data could be transferred from the medical file to the dental one by the dentists himself/herself and viceversa. Personal communication between medical and dental practitioners would remain as a second alternative, when data interpretation required further discussion.

On the whole management information needs are ill-defined. General dental practitioners are the only group of dental professionals who have clearly described information problems regarding the administrative side of their work. These problems always refer to the interpretation of regulations; either the text is obscure, or changes cannot be followed through. At present, the only alternative is enquiring by letter or over the telephone from the Dental Practice Board. Although this alternative strategy solves the problem eventually, it is time consuming and its main difficulty is identifying the individual within the Dental Practice Board who can answer the query. Similar problems appear when the enquiries are made from other official agencies, such as the District Health Authority or the Family Health Services Authority. The up-dating system would be improved, if the official regulations were stored and dissiminated in electronic form. Textual data bases would allow i) instant and thorough up-dating; ii) comprehensive searches of all relevant regulations for each query; iii) explanatory notes giving standard interpretations based on the most frequent queries. On-line searches are faster, more thorough and accurate than manual browsing and in this way the need for making personal enquires would disminish considerably.

Hospital and academic staff have found it very difficult to describe management information needs and how they seek this type of information. Their training as clinicians and academics has provided them with the skills to implement seeking strategies like **Reading** and **Using the library**. These two strategies enable them to handle the associated information sources, i.e. patients' files and printed literature. But as hospital staff have pointed out, they are not trained as managers. It is not just a matter of seeking information, but also how this information is produced, for example how activities and manpower resources are quantified and then translated

into costs. Community service dentists face a similar situation; however, in this case the interviewees have consistently referred to the lack of effective communication downwards regarding policy and planning decisions. Although their comments are indicating a particular problem within that service (upon which we cannot generalize), they also reflect the general division between clinicians and health managers, and that division does not help the information flow. While a patient's file is equally available to any dental professional dealing with that patient regardless of his/her status in the dental hospital, school or community service, and the same goes for a scientific article, **management information** – especially that relevant for financial and budget decisions – is restricted to dentists in senior positions and even them rely necessarily on the information released by health managers. More management training as part of the overall dental training will undoubtedly help to overcome the present division.

The pace of change in certain specialities, for example Restorative Dentistry or Dental Materials, generates a large amount of printed literature. Handling that literature is one problem regarding the use of **scientific information**. This problem is aggravated because some dental professionals do not implement **Reading** and **Using the library** in the most efficient way. General dental practitioners scan regularly the literature that they receive by post, looking for interesting items; whenever they go back to that literature for seeking a specific item, they search it at random relying on their own memory. If they resort to **Using the library**, browsing journals and textbooks straightaway from the shelves is the usual variation of this strategy. Hospital staff implement **Reading** in a similar way and like general dental practitioners they fail to impose any organization on their personal collections of dental literature; but hospital staff are able to make sense of the library organization. However, most formal literature searches are carried out manually and hospital staff know just the basic possibilities of the *Index to Dental Literature* and the *Index Medicus*. In both cases **Reading** and **Using the library** produce some results but they are not thorough ones.

Formal literature searches do help to handle large amounts of scientific literature but they are not free from problems. The essential one is translating the query into a formal indexing language, in this case MESH (*Medical Subject Headings*). Both community service dentists and academic staff have mentioned it along with the fact that these searches are done manually and as a consequence they are time comsuming. If formal literature searches were performed on-line, dental professionals would be able to handle **scientific information** in a more efficient way. However, as we shall see later on, they lack the ability to use information stored in electronic form.

While some specialities are overload with published literature, another ones have their literature both scattered and sparse; that is the case of information on rare syndromes, a key field for dental professionals dealing with medically compromised, handicapped and elderly patients.

On the other hand, the lack of printed literature in some instances is a problem for those dental professionals whose information-seeking behaviour is centred on **Reading** and **Using the library**. For example, clinical trials of new materials and techniques take a considerable amount of time which is in addition to normal publication delays. Orthodontics is another speciality where scientific information in the form of printed literature is not always helpful. General dental practitioners have indicated the need for further practical training, because reading the literature is not enough; meanwhile the specialist orthodontists have pointed out that treatment plans

are based on experience and discussions with other colleagues. In fact we are not facing a real information vacuum because the information exists, but not as published literature. There are presentations explaining new products and techniques, research results are announced at conferences and congresses, sometimes prior to their publication, postgraduate courses provide practical training, discussions with colleagues allow the exchange of clinical experience regarding patients' management. **Attending continuing education events** and **Talking** are appropriate seeking strategies, and these strategies are usually implemented. So, is the lack of printed literature a real information problem? It is not necessarily, but **scientific information** in the form of printed literature dominates the perception of information and somehow dental professionals feel that if it is not printed, it is not information.

Problems of access to dental literature in foreign languages have only been mentioned sporadically; 78.2% of the interviewees considered that most of the dental literature they needed was published in English (Data from Q.24.2).

Finally, there are a few problems regarding the use of scientific literature via the library system. Journals that are not taken by the library is one of them. As a result of the selection policy of the University Medical and Dental Library (the most used library by the interviewees), there is not a comprehensive coverage of foreign journals, even of those in English language. Although the interlibrary loan service compensates that, the delay in obtaining the articles is regarded as a disadvantage. Another problem is access to old issues of journals taken by the University Medical and Dental Library, because they are kept in the stacks of the Main University Library. The University Medical and Dental Library is strategically situated in the Royal Hallamshire Hospital; it is close to the working environment of hospital staff, community service dentists making sessions at the dental school, academic staff and postgraduate students, because the dental school and the dental hospital are right behind that hospital. They visit that library whenever they have a break; visiting the Main University Library, a 15 minutes walk from their site of work, demands more time and understanding a different system, (the journals are shelved alphabetically in the University Medical and Dental Library and by subjects in the Main University Library). Both facts are again considered as disadvantages. Distance between the site of work and the library is a more serious problem for community service dentists who work in clinics around Sheffield, usually away from the university; they, unlike hospital and academic staff, do not have study time included in their work schedules. Distance is also a deterrent for using the library in the case of general dental practitioners, who limit the use of scientific literature to the literature that they receive by mail.

Dental professionals do not possess the skills for using information stored in electronic form. The use of computers was very low in every group of the study, with the relative exceptions of academic staff and postgraduate students (See Table 11.1).

The actual use of computers was limited to word processing. For example, general dental practitioners prepared information leaflets for patients and letters, while other dental professionals used a personal computer for typing their papers and dissertations. Some general dental practitioners used personal computers for keeping their accounts (Int.Nos.107;109;115/Q.31.2), but none of them had any plans for including **patients' information**. Hospital staff used computers mainly for word processing; only one interviewee was learning how to use software packages for prostheses design (Int.Nos.72/Q.31.2) and three specialist orthodontists used a computer programme for

Table 11.1: Use of computer facilities by dental professionals

Category of users[a]	At work		At home		Others	
	%	()[b]	%	()	%	()
General dental practitioners (39)	10.3	(4)	7.7	(3)	0.0	(0)
Hospital staff[c] (25)	12.0	(3)	28.0	(7)	0.0	(0)
Community service dentists[d] (15)	0.0	(0)	20.0	(3)	13.3	(2)
Academic staff[e] (20)	40.0	(8)	30.0	(6)	15.0	*(3)
Postgraduate students[f] (11)	63.3	(7)	0.0	(0)	27.3	*(3)

[a]Data from Q.31.
[b]Values in () indicate frequencies.
[c]In October-December 1989, the Charles Clifford Dental Hospital did not have a general computer system. Computer facilities were sparse and spread unevenly in different departments.
[d]In August-September 1989, the Sheffield Community Dental Service did not have computers in the clinics.
[e]In June-July 1989, computer facilities varied from one department to another of the Dental School; most of them were not linked to the university computer network.
[f]They shared facilities with academic staff.

* Registered users at Sheffield University Computer Centre.

recording and measuring cephalometric radiographs (Int.Nos.73;84;85/Q.31.2). The lack of computer facilities in the clinics of the Community Dental Service can be considered as the main reason for not using them at work, but only 20% of the community service dentists used them at home and again the main use was word processing. Academic staff used personal computers predominantly for typing papers and thesis, but some of them used statistical and graphics packages (Int.Nos.27;28;33;35/Q.31.2). A few of them had organized bibliographic databases for storing bibliographic references of literature relevant to their specialites (Int.Nos.17;19;33;35/Q.31.2). One department at the dental school had developed a data base for a diagnostic index (Int.Nos.18;21;22/Q.31.2) which was the only major computer application operating at the time of the interviews. Postgraduate students used exclusively the computer facilities available in their departments; the only application they were interested in, was word processing for preparing the dissertation.

The provision of computer facilities at the dental school and the dental hospital was not part of a plan at institutional level. Each department had acquired different equipment at different times, meeting temporary or specific needs. For example, a personal computer might have been bought for a particular project, once the project was over the computer was left behind until somebody else started using it again. Another example, a department at the dental school bought enough personal computers for its postgraduate students, but the others did not.

The lack of an institutional plan for implementing computer applications is undoubtedly an important factor that has slowed down the development of computer applications for dental teaching, practice and research. But an even more important factor is that the majority of the dental professionals are computer illiterate. They do not use computers not only because the equipment is not available at work, but because they lack knowledge of how computers can help them, they lack knowledge

of how to use computers and they even lack basic typing skills. This lack of computer awareness affects the efficiency with which dental professionals exploit **patients' information, management information** and **scientific information**, because in all three cases their information needs would be met more efficiently by taking advantage of computer technology.

The situation is likely to change both at national and local levels. In the first place, the Government has fully recognized the value of information technology for supporting its reforms to the National Health Service. The Department of Health has outlined the short and long-term goals regarding information systems in its document *FRAMEWORK for information systems* (1990). One of the short-term goals is that general practices holding practice funds (GPFHs) were expected to be computerized by April 1991 at least regarding "Körner" minimum data sets and invoices to the District Health Authorities. As a way of helping this process, for the first time general practitioners are able to claim 50% direct reimbursement of any computer-related cost[2].

Both the Government's demands and the financial support for the installation of computer systems in general practices, will change the attitude of general practitioners towards computers, let alone dentists.

In the second place, the School of Clinical Dentistry and the Charles Clifford Dental Hospital are planning computer re-equipment in the context of the new building for the former and extensive building reforms for the latter. At the same time computer training is being considered in the new dental curriculum.

All these measures will change the current situation for the best. But still the problem remains regarding dentists in general dental practice; computer training needs to become part of continuing dental education programmes as the most effective way of narrowing the gap between those who are already in practice and those who are currently receiving undergraduate dental training.

The study has revealed the context in which the information needs of dental practitioners arise, their nature and the main problems that dental professionals face when they want to satisfy those needs. But the study has also revealed how dental professionals seek information. The next section discusses the similarities and differences between dental professionals regarding information-seeking behaviour.

11.3 The information-seeking behaviour of dental professionals

11.3.1 Basic strategies

Reading

Hospital staff, community service dentists, academic staff and postgraduate students implement this strategy for any condition related to their clinical and academic tasks, while general dental practitioners have mentioned it in relationship to new products and techniques, equipment and dental politics only. Since general dental practitioners tend to work with more stable groups of patients, they rely on **Enquiring** from the patients and general medical practitioners for seeking **patients' information**.

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[2]Op.cit., p.17.

On the other hand, as general dental practitioners do not usually deal with patients suffering from serious/rare medical conditions, they do not need to seek this sort of information.

The associated information sources are patients' files (written documents) and dental literature (printed documents), but each subgroup focuses **Reading** on different types of documents. Only hospital staff and community service dentists implement **Reading** as a regular strategy for seeking **patients' information**. Patients' files become a very important information source for these two groups because they are constantly dealing with new patients. General dental practitioners read mainly general dental magazines such as *Dental Practice* and *The Probe* and general dental journals like *British Dental Journal* that cover any new development in Dentistry and the political aspects of the profession as well. Hospital staff base **Reading** on journals, while magazines are far less important. In the case of the community service dentists, this strategy refers equally to journals and magazines. Both academic staff and postgraduate students base **Reading** on journals and textbooks; all the other groups use textbooks for reference purposes mainly. The common pattern of use – except for general dental practitioners – is the combination of a general dental journal, which is usually the *British Dental Journal* and one or several specialist journals. This combination enables dental professionals to find information about their speciality as well as general developments in Dentistry at scientific and professional levels.

Reading associated with dental literature refers primarily to literature that comes to the dental professionals. However, the patterns of borrowing indicate the degree of relationship between **Reading** and **Using the library**. In the case of general dental practitioners **Reading** is clearly independent from **Using the library** because borrowing is from the practice, other colleagues or a member of the family. On the other hand in the case of postgraduate students, **Reading** is fully dependent on **Using the library** because all of them read regularly materials obtained from the library. The boundaries between **Reading** and **Using the library** are not clearly defined in the case of hospital and academic staff, in both cases they read routinely journals received by subscription or membership and journals taken by the library. Community service dentists are a very mixed group in terms of their tasks, and strategies vary accordingly; those doing general Children's Dentistry based **Reading** on literature received by membership of a professional association or free; those in senior positions make extensive use of dental literature and then **Reading** becomes inevitably dependent on **Using the library** .

Reading has two main variations:

Regular scanning of the literature as it arrives. Dental professionals read selectively whatever seems to be interesting: an article on a new technique, notices on conferences and courses, advertisements of jobs, products or equipment. This variation brings the information before the information need is actually defined. As dental professionals trust that everything that is relevant at scientific and political levels appears in the literature, this variation is common to all subgroups.

Retrieving specific items : dental professionals search printed literature looking for items defined in subject or author terms; it includes searching a textbook for checking on a particular condition or technique they are not familiar with. In this case, a specific information need has been defined and dental professionals

go back to their collections at home or at work to search the literature they have already scanned and to some extent read. But dental professionals have poor organizational skills, their literature collections are barely organized by subject (personal subject subdivisions) or date order, or those collections are not organized at all. As a consequence they retrieve at random relying on their own memory; general dental practitioners are the typical case, but this variation is also common with community service dentists and academic staff. Hospital staff compensate for the lack of organization of their personal and bench collections by using the library system, so in fact this variation of **Reading** is replaced by **Using the library**. Postgraduate students do not use this variation either, because **Reading** is generally a complement to **Using the library** instead of a strategy on its own. Only academic staff are able to implement this variation in the form of formal literature search. Some of them keep personal collections fully indexed by subject and author; these indexes are manual or computer based. In these cases **Reading** and **Using the library** are not only dependent on each other but they are implemented in the same way.

Reading is associated with information sources that are immediately available: patients' files, cuttings and photocopies, personal copies of journals. Another value is its flexibility, especially in the case of printed literature; dental professionals can browse and read journals at home, during a break at work, on the train, and as a personal possession they can keep them for as long as they want.

Talking

It is a useful seeking strategy in any situation – diagnosis, treatment, new techniques, dental management, dental politics, research projects – for any group of dental professionals.

Although the associated information source is always the same: colleagues, the patterns of interaction are different in each subgroup. Informal conversations spontaneously started at work, at home or at a social meeting are the variation used by general dental practitioners. This variation also appears in all the other subgroups, but there, we find formal patterns of interaction as well.

The formal variations of **Talking** are:

Joint clinics for seeking **patients' information** related to diagnosis, treatment plan and treatment progress. It is a fundamental information-seeking strategy for hospital staff and community service dentists, who use it routinely.

Presentation of cases for teaching purposes. This variation integrates **patients' information and scientific information** because it enables dental professionals to seek information about dental conditions and techniques in the context of a particular case and viceversa how to deal with a particular case in the context of current treatment trends. It is used regularly by postgraduate students, hospital and academic staff.

Journal clubs for seeking **scientific information** related to new developments in each dental speciality. As the former it is associated with teaching activities and it appears in the work schedule of postgraduate students, hospital and academic staff. This variation is related to **Reading** and **Using the library** because the

dentist who chairs the session of a journal club presents an article that s/he has selected from her/his own collection or from the library's.

Staff meetings for seeking **scientific information** related to new developments in Dentistry has only been mentioned by some academics and general dental practitioners; the latter may use them for seeking **management information** as well.

Committee meetings for seeking **management information.** It is used regularly by hospital and academic staff to deal with the administration of both the dental hospital and the dental school. Again this variation relates **Talking** to **Reading** because the information sought, exchanged and produced at these meetings becomes a written document which becomes in turn the information source for the next meeting.

Community service dentists stand apart regarding formal patterns of **Talking**; their fragmented pattern of work does not allow to include them as a regular feature in their timetables; joint clinics are the only exception because senior dental officers visit the clinics of the service. Community service dentists implement other strategies like **Reading** and **Using the library** for seeking **scientific information**, but the lack of staff meetings has been identified as an obstacle for finding **management information** relevant to the organization of the Community Dental Service.

Informal conversations suit any pattern of work because even general dental practitioners in solo practice can seek information from other colleagues. The formal patterns of **Talking** enumerated above adapt to clinical and academic tasks and each subgroup has several of these patterns included in their work schedules. This adaptability of **Talking** explains why colleagues have always appear as the most important or the second most important information source in previous user studies (Ashin-Strother, Lancaster & Gardiner, 1986; Hewlett, 1986; Landesman et al., 1986).

Talking is implemented whenever dental professionals need factual information as well as advice, opinion, somebody else's ideas or personal experience, because of that is a fundamental information-seeking strategy in the context of clinical work for all the subgroups. Its implementation is easy and its results are immediate, because colleagues always give a reply. It saves implementing other strategies like **Reading, Using the library** and **Enquiring** which are more time consuming and besides, printed literature is not as flexible an information source as another dentist. Conversely it helps implementing other strategies, for example academic staff have mentioned it as an initial strategy when they cannot identify a document source. Finally, **Talking** is useful for finding information that may not be in printed form yet, that is the case of hospital staff who find out about very recent developments, research progress or new trends by asking colleagues with more expertise in the speciality.

Enquiring

Dental professionals implement this strategy to find out a specific piece of information that they cannot find in printed form, because:

- the information is not in printed form, for example the patient's reason for calling on the dentist;

- they do not know whether it is published for example information on non-dental topics;

- the information in printed form is not clear enough, for example the text of a regulation is ambiguous.

General dental practitioners, hospital staff and community service dentists select **Enquiring** at the diagnostic stage for seeking **patients' information**. The first step is a dialogue with the patient and then if it is necessary further enquiries are made from other health professionals. On the other hand academic staff and postgraduate students do not perceive the dialogue with the patient as an information-seeking event in the context of diagnosis; they have described **Enquiring** as a strategy for seeking **patients' information** only from other health professionals.

Regarding **management** and **scientific information, Enquiring** appears again in all subgroups but the extent of its application varies with the extent of each group's involvement with research and management work. Community service dentists only use it for organizing dental screenings of the school population. General dental practitioners, hospital and academic staff use it for seeking information related to every aspect of practice, hospital and school management: finances, legal cases, building maintenance, equipment, stock supplies, etc. Academic staff use it for seeking information required for research, teaching and the preparation of non-printed publications (videos, computer software), as well. Postgraduate students use it for seeking information on fields outside Dentistry but relevant to their research projects.

The variations of **Enquiring** are always the same, regardless the situation: face-to-face dialogue, telephone conversation, written communication (letter, report). They are selected depending on the urgency of the enquiry (verifying the medication the patient is taking is done on the telephone) or the formality of the request (social worker's report on a case of child abuse).

It is generally associated with individuals, who are the patients themselves, the parents in the case of children, or experts on non-dental specialities. Information services are far less contacted.

Enquiring is not an effortless strategy; individuals are difficult to find and trace, and even the dialogue with the patient may not be successful. It is not preferred as an initial strategy and it usually appears in **combined and complex patterns.** While **Reading** and **Talking** refer to well-known information sources, i.e. dental literature and colleagues, **Enquiring** is usually implemented when dental professionals cannot find the information in a document or from a colleague. It is the most problematic of all the basic strategies because it is closely related to management information needs. In the same way that dental professionals cannot define these needs clearly, they have not clearly described **Enquiring** as an information-seeking activity.

Attending/organizing continuing education events

This strategy is applied to meet information needs originated by three conditions: learning new dental techniques, keeping up-to-date and postgraduate studies.

The typical events are courses and conferences on subjects relevant to each speciality; relevance to the speciality is important for hospital staff, community service dentists and academic staff who need leave of absence to attend them. General dental practitioners have mentioned dental fairs and manufacturers' presentations for seeking

product and equipment information. General dental practitioners, community service dentists and postgraduate students only attend continuing education events; the latter do so as part of their postgraduate course or as a complement to it. Hospital and academic staff are also involved with the organization of courses and conferences; they may attend these events as members of the public, as organizers and lecturers or as both.

The common obstacles to implementing this strategy are job commitments, cost and time, but on the whole dental professionals attend continuing education events at least once or twice a year, or even more frequently. General dental practitioners attend courses more frequently than conferences. They prefer the practical approach of courses, for example how to use a new dental material, how to prevent cross-infection. Courses, unlike conferences, provide information that is directly relevant to their everyday practice. On the other hand, hospital staff attend conferences more frequently than courses because of the opposite reason; both consultants with more than 20 years in practice and recently graduated house officers – the majority in this group – find training less necessary than keeping up-to-date with new developments and research results.

Distance is not a deterrent to implement this strategy, when dental professionals attend these events, they are prepared to go anywhere in the country. However, local events are particularly important for general dental practitioners, who rely on courses and lectures organized by the dental hospital and the local branches of the *British Dental Association* and the *British Paedodontics Society* more than any other subgroup. Events abroad are seldom attended, only some postgraduate students attend such courses, but they are overseas dentists who enroll in courses and conferences abroad when they are in their home countries.

The findings of Landesman et al. (1986) about the role of continuing dental education are corroborated. As an information-seeking strategy **Attending...** meets long-term information needs associated with keeping up-to-date and postgraduate training. It does not provide an immediate response, and therefore it is implemented either in combination with other strategies or as a background strategy. General dental practitioners, hospital staff and community service dentists implement **Attending ...** in combination with **Reading, Talking** and **Enquiring**. In contrast, academic staff and postgraduate students limit this strategy to routine up-dating, but their actual information-seeking for specific situations is based on **Reading, Talking** and **Using the library**.

Watching

Dental professionals have associated this strategy with the use of audiovisual materials, they never mentioned observing another colleague as a way of seeking information.

Audiovisual materials are regarded as an excellent way of showing techniques and describing real life emergencies in the dental chair. But are they actually used for seeking-information? General dental practitioners use videos which are generally sent free of charge to their practices. Hospital staff use self-produced slides for lecturing, presenting cases and keeping patients records. Community service dentists use videos found at work or watch slides at lectures, presentations or postgraduate courses. Academic staff use a wide variety of audiovisual materials, from blackboard and chalk to videos, for teaching; this group self-produce most of the materials that they use as

well. Postgraduate students use videos for learning techniques and slides for keeping patients records.

Watching is related to teaching and learning techniques and to storing **patients' information** (for example, x-rays or slides illustrating treatment progress), but as a seeking strategy it has been described in combined and complex patterns by general dental practitioners and hospital staff only. Community service dentists, academic staff and postgraduate students do not perceive it as an information-seeking strategy.

Watching is a possible information-seeking strategy; but it is the least important one in the overall information-seeking behaviour of dental professionals because it is the least conscious way of seeking information. It is so, despite a general high opinion about the value of audiovisual materials.

There are several reasons explaining that contradiction:

- The average commercial cost of a dental video is £200[3], and it covers a single topic. A year subscription to the *British Dental Journal* that appears every fortnight covering all sorts of topics is £170. This difference explains why the use of videos is related to free schemes run by the Government and a video magazine that has discontinued the programme at the moment[4].

- Audiovisual materials – unlike journals – need equipment and a special setting to watch them.

- The commercial production of dental videos is still sparse and irregular, while publishing in Dentistry is well established, comprehensive and regular.

- Audiovisual materials are not included in dental data bases or printed bibliographies and therefore they are more difficult to identify than journal articles.

Despite all the advantages of audiovisual materials over printed literature, the former are more expensive, less accessible and less available than dental journals, not to mention other sources like colleagues which cost nothing and are always around.

Using the library

This strategy refers essentially to the use of printed literature via the library system. As such it has general characteristics that appear in each subgroup of dental professionals:

- it is inevitably linked to **Reading** in a twofold relationship, i.e. sometimes it precedes **Reading** as an initial strategy, sometimes it continues **Reading** as an extension;

- it is centred on library services close to the place of work; distance is a deterrent for implementing this strategy;

- it has three variations:

  scanning journals and books : dentists visit the library to check from the shelves new journal issues and other latest acquisitions;

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[3]Data from Oxford Educational Resources Catalogue, the largest commercial supplier of videos on Dentistry in the U.K., August 1989.

[4] "Dentistry Videos" published by Trade and Technical Business Programmes Ltd., London.

document searches : dentists have already got bibliographic references of the documents they want to find and look for them straightaway from the shelves;

formal literature searches : dentists use library catalogues, or printed bibliographies to search by author or subject.

However, **Using the library** – unlike all the other strategies – plays very different roles in the information-seeking behaviour of each subgroup of dental professionals. General dental practitioners do not implement it, except as a last resort, and as most of the time they successfully replace it by other basic strategies, mainly **Reading** and **Talking, Using the library** is not actively implemented by the majority of them. On the other hand, academic staff and postgraduate students centre their information-seeking behaviour on **Using the library**. Between these two extremes, **Using the library** is a strategy as important as **Reading** and **Talking** for hospital staff while community service dentists implement it as a complement to **Reading, Talking** or **Enquiring**, when the results of these strategies are not satisfactory enough. These differences are related to the job patterns of each subgroup and the conditions for their information needs. General dental practitioners are clinicians working in practices away from a dental library; hospital staff have clinical and academic commitments, the former always urgent but a dental library is close to their place of work; community service dentists have also a mixed pattern of tasks similar to that of hospital staff, but they, like general dental practitioners, work in practices away from a dental library; academic staff and postgraduate students have mainly academic commitments and a dental library is close to their place of work.

The differences remain in the way the variations are implemented. General dental practitioners usually scan journals and textbooks, looking for literature on a specific topic or they look for a specific document. In both cases, the search is done straightaway from the shelves. They retrieve literature from the library in the same hapzard way they do from their own collections.

Hospital staff are more familiar with the library system than general dental practitioners; however, hospital staff only know the basic searching possibilities of the *Index Medicus* and the *Index to Dental Literature*. If they carry out formal literature searches, these searches are always manual by subject headings or by author in the main part of the those bibliographies. On-line searches are less used, partly because they have to wait for the results and if it is patient-related information they want to leave the library at least with one article; and partly because they – like other dental professionals – are not aware of how computer technology can help them to find information.

Community service dentists implement **Using the library** in the same way as hospital staff, if they select that strategy; some of them never do it.

Academic staff implement the three variations of **Using the library**; but formal literature searches – both manual and on-line – are very much used by this subgroup. That variation is irreplaceable when large amounts of literature have to be reviewed for research-related work.

Postgraduate students also centre this strategy on the same variation as academic staff, but in their case formal literature searches are always manual. While some members of the dental school keep personal data-bases in their computers and have downloaded certain journals from Medline, postgraduate students – with one excep-

tion – were not aware of these possibilities; and the one student who had requested an on-line search did so because he was not familiar with the library system.

The ways in which **Using the library** is implemented by dental professionals have several direct implications for future development of information services, both regarding those who are not library users and those who are. As we will see later on, in the first case the findings point to possible ways of attracting the groups of non-library users, and in the second case the findings point to the need for user education and further research.

11.3.2 Patterns of information-seeking behaviour

Dental professionals have described **simple patterns** for seeking **patients' information, management information** and **scientific information** required by any condition (diagnosis, treatment, practice management, teaching, research, etc.). Regardless their clinical or academic commitments dental professionals seek information in the most economic way in terms of time and effort, not necessarily in terms of cost. This predominance of **simple patterns** is a consistent characteristic of each subgroup in the study.

However, **simple patterns** refer to different basic strategies in each subgroup, and these differences are the key for understanding the different styles of information-seeking amongst dental professionals.

General dental practitioners base their information-seeking behaviour on **Reading, Talking** and **Enquiring**, the three strategies that appear in their **simple patterns**. These three strategies enable them to use a wide enough range of information sources (dental literature, colleagues, experts) that in turn can satisfy most of their information needs.

Hospital staff have the most versatile information-seeking behaviour, their **simple patterns** cover all the basic strategies, except **Attending/organizing continuing education events**. This versatility is explained by the mixture of clinical and academic tasks which provokes the widest range of information needs amongst dental professionals. Despite that versatile information-seeking behaviour two basic strategies emerge as the central ones: **Reading** and **Using the library** and this characteristic persists in their **combined and complex patterns**

Community service dentists have described very similar **simple patterns** to those of hospital staff, since the scope of their tasks can be as extense as theirs.

Academic staff have described **simple patterns** especially for seeking information required by academic tasks such as teaching, researching, or preparing a publication; therefore the use of **simple patterns** is limited neither to seeking information required by clinical tasks nor to clinicians like general dental practitioners, hospital staff or community service dentists. As already mentioned **simple patterns** are a general characteristic of the information-seeking behaviour of dental professionals. The distinctive characteristic of that behaviour in the case of academic staff is a constant preference for literature sources. Whenever they implement strategies like **Talking** or **Enquiring** is because there is not a literature source or they cannot find one.

The predominance of **simple patterns** in the case of postgraduate students is related to particular characteristics of this group. Postgraduate students perceive their research work in a fragmented way. As a result of that they describe information needs for each stage of it (definition of the research project, literature review, data

collection), instead of considering the whole process as a single event that demands the combination of several information-seeking strategies. At the same time, postgraduate students show a lack of ability: i) to describe how they seek information; ii) to seek information autonomously; and iii) to express themselves in English, which was a second language for the majority of the interviewees. It is difficult to discern, whether postgraduate students prefer these patterns because they, like the other groups of dental professionals, try to seek information in the most economic way or whether they described **simple patterns** because this particular group of students could not express themselves in a more articulate way to describe more complex patterns.

Combined patterns are implemented when the initial strategy has not provided enough information or when different types of information available from different sources are necessary. The commonest combination is the use of literature sources and face-to-face communication which results when **Reading** or **Using the library** is combined with **Enquiring** or **Talking**. Another combination that appears always in academic situations is **Reading** and **Using the library** complementing each other.

The distinctive characteristics of **combined patterns** in each subgroup of dental professionals confirm the differences already indicated by **simple patterns**. In the case of general dental practitioners **combined patterns** are used when the initial strategies **Reading, Talking** and **Enquiring** have not provided enough information. These three strategies appear combined between themselves or with **Attending...** or **Using the library**.

Hospital staff use pairs of strategies to obtain different types of information for example they read the patient's file and 'watch' radiographs to find out clinical information about the patient. Their **combined patterns** are centred on **Reading** in the case of clinical situations and on **Using the library** in the case of academic situations.

Again the **combined patterns** described by community service dentists are similar to those of hospital staff.

The preference of academic staff for literature sources continues in the **combined patterns** they use because the initial strategy of these pairs is **Reading** or **Using the library**.

Postgraduate students show only one **combined pattern**: **Using the library** and **Talking**, and this is the highest level of complexity showed by this group; postgraduate students have not described complex patterns.

Complex patterns are more elaborate ways of using printed literature and face-to-face communication than the **combined patterns**. **Complex patterns** include as many strategies as it seems necessary. Each strategy extends and complements the results of the previous one, using different information sources. For example a dentist seeking information on a new technique may read an article on it, attend a course and discuss it with other colleagues.

Complex patterns are likely to be used for seeking information related to any clinical or academic situation as long as there is time for implementing several strategies and it is necessary to do so. For example, in the case of clinical work **complex patterns** are used for seeking information about complicated clinical cases because of the diagnosis or the treatment.

The **complex patterns** of general dental practitioners differ from those of the other subgroups, because their axial strategy is **Reading** and **Using the library** does not appear; while these two strategies are usually included in the **complex**

patterns described by hospital staff, community service dentists and academic staff. At this level there are not any other major differences between each subgroup of dental professionals.

11.4 Conclusion

The research does not radically contradict the results of previous user studies in Dentistry. Instead of challenging those findings, it puts them in the whole context of dental professionals' information-seeking behaviour, showing their relative validity.

The nature of the information needs of dental professionals is far more complex than what some user studies have indicated (Ashin-Strother, Lancaster & Gardiner, 1986; Hewlett, 1986 and Walker, 1976). Keeping up-to-date and dealing with patients are just two **conditions** likely to provoke information needs, but information needs also appear in the context of practice management, teaching, researching, writting papers or reading for a postgraduate degree. The actual scope of information needs varies with job patterns. Although job patterns may have individual variations, this study has shown the basic conditions for information needs regarding each kind of dental practice: general dental practice, hospital dental service, community dental service, dental school as acadmeic or as full-time postgraduate student. As a consequence the assumption – accepted by Walker (1976 and 1978) – that general dental practitioners and community service dentists on one hand and hospital and academic staff on the other can be considered as two single groups for user study purposes cannot be accepted any more. Even though this study has indicated some similarities between hospital staff and community service dentists, their job patterns are different enough to consider them as two separate subgroups of dental practitioners.

This study confirms the importance of journals and colleagues as information sources, that has been indicated by Ashin-Strother, Lancaster & Gardiner (1986), Hewlett (1986), Landesman et al. (1986) and Walker (1976 and 1978). But the importance is shown in the wider context of **Reading** and **Talking** as information-seeking activities associated with different kinds of dental literature and colleagues.

Libraries are the least used information source (Ashin-Strother, Lancaster & Gardiner, 1986) only in the case of general dental practitioners when they are not involved in academic tasks.

As Landesman concluded, continuing education events have a less relevant role as information source than it has been assumed (Landesman et al.,1986). But this happens because **Attending/organizing continuing education events** can only meet long term information needs and not because continuing dental education is not adequate ; when immediate responses are necessary, other basic strategies are more suitable.

It has also been suggested that working environment determines information needs and influences preferences for information sources (Ashin-Strother, Lancaster & Gardiner, 1986). In fact working environment determines **conditions** for information needs and influences the implementation of information-seeking activities (**strategies**). For example, treatment plan for a medically compromised patient is a **condition** for hospital staff information needs but whether or not information is required about a particular syndrome is a personal decision of the dental practitioner in charge of the case. *Joint clinics*, *Presentation of cases*, *Journal clubs* are typical formal in-

teractions of **Talking as a strategy** of hospital staff. But we cannot generalize that hospital staff prefer colleagues to any other information source. Information needs strictly speaking are the result of the individual's own process of making sense of reality and so are the preferences for information sources.

The research has investigated the behavioural aspects of that sense making process, with reference to dental professionals, which had not been investigated before. In doing so, it has identified the basic information-seeking strategies implemented by dental professionals. The variations of these strategies show how dental professionals use information sources when they seek information. These findings suggest several implications for the provision of information services, which are discussed in the final chapter along with the value of the model developed for this study.

Chapter 12

Conclusions

The study

The methodological approach followed by this research has succeeded in giving a different insight into dental professionals information-seeking behaviour. We have progressed from knowing about some groups of dentists and the use of some information sources to having a complete view of how a representative group of that profession uses a variety of information sources.

That complete view shows essentially that:

- despite individual preferences any of the **basic strategies** is indispensable at some point. As a consequence no strategy can be disregarded and considered less relevant than others. Another consequence is that undergraduate and post-graduate training should ensure that dental professionals acquire and update the necessary information skills to deal with an increasing variety of information sources. So far the former has relied on teaching how to use traditional library services and the latter seems at the risk of becoming too centred on computer applications for practice accountancy.

- information needs are related to **conditions** determined by job patterns. These job patterns can provide a general framework to predict information needs by kind of dental practice. But job patterns are not static, changes in health care policies as well as scientific progress modify these patterns. The most recent example is the reform process in the National Health Service that has changed dramatically the managerial responsibilities of clinicians. Individuals change as well, progressing from one role to another in their professional careers. Therefore the development of suitable information services should take into account not only that information-seeking is a complex behaviour, but also that it refers to a changing reality.

- **Reading** and **Talking** emerge as the most important **basic strategies**. They represent the traditional way of seeking information. However, present demands on dental professionals mean that these strategies are not suitable to deal with **management information**.

- the present variations of **Enquiring** – telephone, face-to-face and written enquiries – are not sufficient to deal with **management information**.

- audiovisual materials are mainly used for teaching and despite all their acknowledged advantages over dental literature do not constitute an irreplaceable information source.

- the largest group of dental professionals – the general dental practitioners – is not an active user of library services. Present library services are designed to help research, teaching and clinical work of students, academic and hospital staff.

- the current computer skills of dental professionals match neither the possibilities offered by computer technology, nor the demands made by changes in the health system and advances in Dentistry.

- the organizational skills (ability to locate, record and store information[1]) of dental professionals need to be improved as the only way of effectively improving their performance as information seekers.

On the other hand from a strictly methodological point of view, the research tools have proved their value for future application in further health care user studies:

- sampling health professionals by kind of practice within a single profession allows the combination of a discipline – Medicine, Dentistry, etc. – with job patterns – general practice, hospital service, etc. – to obtain a more accurate view of their information needs.

- interviewing – despite the problem of interviewee's bias – can provide a rich insight into users' perception of their information needs and how they solve them. It is also the best alternative to actual observation.

- the coding paradigm – derived from grounded theory analysis – can be used to study the information-seeking behaviour of other health professionals from a qualitative point of view.

The implications

The findings of this study have implications for library and information services, computer developments and dental education.

The main implications for library and information services in Dentistry are:

- since distance from the library is one of the obstacles to seeking information via the library system, libraries need to reach dental practitioners in their practices. Possible services to develop are:

  - access to the on-line library catalogue from a personal computer at the practice;

  - fax service for requesting searches, loans and photocopies;

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[1]Markless & Streatfield (1989).

- SDI services targetted at general dental practitioners and community service dentists; present services of that kind are only targetted at academic and hospital staff.

- since audiovisual dental materials are only actively used in the context of teaching, libraries should develop these sort of collections only when they are actually used in training programmes at undergraduate and postgraduate levels. If these collections are developed independently of such activities, libraries risk investing on resources that are going to be underused.

- since active library users amongst dental professionals rely on manual bibliographic literature searches, end-user training for on-line searches is another area for expanding library services.

- since one of the problems of formal literature searches is the structure of the indexing language – MeSH –, another possibility for library services is to teach dentists the use of on-line facilities that compensate for the weaknesses of MeSH.

- since library and information services for dental professionals are mainly provided by academic medical libraries and hospital libraries, monitoring users' needs and information-seeking behaviour as a regular feature of their activities is the only solution for making users (all kinds of them, not only dentists) the real centre of these services.

Several possibilities for computer applications in the domain of data-base design have been identified:

- full-text data-bases for regulations issued by Local Health Authorities, the Dental Practice Board, the Health and Safety Executive and the Department of Health.

- bibliographic data-bases covering fields of specific interest to dentists:

  - dental materials (including literature references and manufacturers' literature);

  - rare syndromes and their implications for dental treatment;

  - dental treatment for handicapped and elderly patients.

- transference of patients' files to electronic form not only for billing purposes and reporting back to the local health authority for payments, but also for diagnosis and treatment.

The main implication for dental education is the need to include information skills as part of the dental curriculum at undergraduate and postgraduate levels. Special attention is needed regarding organizational skills. Dental professionals need to acquire the computer skills to locate, record and store information in electronic form, because this is the only long-term solution to overcome the present fragmentation of information systems.

Computer training for dental professionals covering:

- computer awareness courses, useful to overcome resistance to computers,

- typing courses, necessary to achieve practical control over the machine,

- on-line searching to learn how to retrieve electronically stored information,

- data-base design and applications to create their own files, especially the use of readily available software packages,

is an urgent demand for clinical, management and research work of dental practitioners.

Suggestions for further research

The study has opened several possibilities for further research:

- applying the model used in this study to other groups of dental professionals in other parts of the country;

- applying the same model to study the information-seeking behaviour of other health professionals;

- selecting a single **strategy** for in-depth research.

- monitoring the use of Medline in CD-ROM by dental professionals;

- further investigation of management information needs of dental professionals.

Current changes in the dental profession due to government reforms of the National Health Service warrant the first. The lack of qualitative research regarding health professionals' information-seeking behaviour justifies the second. The third possibility is valuable for short-term projects, for example if a particular library wants to identify use patterns by dentists of its services. The fourth possibility is necessary to assess whether the free-text facilities of this version of Medline compensate for the lack of specificity of MeSH regarding dental topics. Finally the results of this study have identified management information needs as the most difficult problem of dental professionals at the moment.

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Appendix 1:
The Interview Schedule

CONTROL SHEET

NAME:.....................................

ADDRESS:...................................
....
....
....

TELEPHONE:.................................
....

Date of introductory letter:...............................

Phone calls to arrange interview:..........................
(to record: date and time)................................
....
....

Date of interview:...
(to record: date; time; duration).........................
....
....

OBSERVATIONS:..
....
....
....
....

CATEGORY OF USER:_____ |‾‾|
(According with categories of survey) |__|
                                                   Sex

SECTION A   INFORMATION NEEDS

        I am going to ask you some questions about
        occasions when you need information.

General aspects

Q.1.-   HAVE YOU RECENTLY NEEDED INFORMATION TO DEAL WITH A
        SITUATION IN YOUR JOB?

  NO / YES
        ↓
        Could you describe this situation?

Q.2.-   HOW SATISFIED DO YOU FEEL ABOUT THE RESULTS?

        Show scale of categories and ask to choose one

                    very satisfied
                    satisfied
                    neither satisfied nor dissatisfied
                    dissatisfied
                    very dissatisfied

Q.2.1.-   WHY?

Q.3.-   WHICH IS THE ASPECT OF YOUR WORK, WHERE YOU NEED
         INFORMATION MORE FREQUENTLY?

Q.4.-   WHY DO YOU THINK THIS HAPPENS?

Q.5.-   WHICH IS IN YOUR OPINION THE MOST DIFFICULT KIND OF
         INFORMATION TO FIND?

Q.5.1.- WHY?

<u>Innovations</u>

>Now we are going to talk about your information
>needs regarding innovations in the dental field.
>I am going to show you some cards and I want you
>to read one at a time and answer some questions.

Q.6.- HAVE YOU HEARD ABOUT (Show first card) ANY OF THESE?

Q.6.1.- Prevention of occupational hazards

- Vaccination against Hepatitis B	YES / NO
- Use of rubber gloves for operating	YES / NO
- Use of protective goggles by	
dentist	YES / NO
dental surgery assistant	YES / NO
patient	YES / NO

Q.6.1.1.- HOW DID YOU FIRST HEAR ABOUT IT/THEM?

Q.6.1.2.- WHAT ELSE HAVE YOU DONE TO LEARN ABOUT IT/THEM?

Q.6.1.3.- HAVE YOU ADOPTED IT/THEM?

NO / YES   (Keep card apart)

Q.6.1.4.- WHY NOT?

-4-

Q.6.2.- Dental equipment

- Autoclavable handpieces   YES / NO
- Fibre-optic light   YES / NO
- Pan-oral radiographic machine YES / NO
- Blunt probe   YES / NO
- Ultra sonic scaler   YES / NO
- Tray system for the autoclave YES / NO

Q.6.2.1.- HOW DID YOU FIRST HEAR ABOUT IT/THEM?

Q.6.2.2.- WHAT ELSE HAVE YOU DONE TO LEARN ABOUT IT/THEM?

Q.6.2.3.- HAVE YOU ADOPTED IT/THEM?

NO / YES   (Keep card apart)

Q.6.2.4.- WHY NOT?

Q.6.3.- Dental pharmacology and anaesthesia

        - Referral for general anaesthetic care   YES / NO
        - Inhalation sedation   YES / NO
        - Prescription of amoxyl   YES / NO

Q.6.3.1.- HOW DID YOU FIRST HEAR ABOUT IT/THEM?

Q.6.3.2.- WHAT ELSE HAVE YOU DONE TO LEARN ABOUT IT/THEM?

Q.6.3.3.- HAVE YOU ADOPTED IT/THEM?

           NO   /   YES   (Keep card apart)

Q.6.3.4.- WHY NOT?

Q.6.4.- Dental materials

        - Glass ionomer materials   YES / NO
        - Posterior composites   YES / NO

Q.6.4.1.- HOW DID YOU FIRST HEAR ABOUT IT/THEM?

Q.6.4.2.- WHAT ELSE HAVE YOU DONE TO LEARN ABOUT IT/THEM?

Q.6.4.3.- HAVE YOU ADOPTED IT/THEM?

        NO / YES   (Keep card apart)

Q.6.4.4.- WHY NOT ?

Q.6.5.- HAVE YOUR HEARD ABOUT NEW TECHNIQUES OR PROCEDURES
RECENTLY?

NO / YES

WHICH?

Q.6.5.1.- HOW DID YOU FIRST HEAR ABOUT IT/THEM?

Q.6.5.2.- WHAT ELSE HAVE YOU DONE LEARN ABOUT
IT/THEM?

Q.6.5.3.- HAVE YOU ADOPTED IT/THEM?

NO / YES

Q.6.5.4.- WHY NOT?

Showing all cards with the Innovations,
the respondent has heard about   ASK

Q.7.-   WHICH OF THESE WERE THE MOST DIFFICULT   TO   FIND
        OUT ABOUT?

Q.8.-   WHY?

SECTION B   SOURCES OF INFORMATION

> Questions, now, will be related to the different ways
> in which you may or may not look for information.
> First of all,

Q.9.-   WHEN YOU NEED INFORMATION WHICH IS THE FIRST
         SOURCE YOU THINK OF?

Q.10.-   DO YOU USE IT REGULARLY FOR ANY KIND OF INFORMATION OR
         IN SPECIFIC CASES?
         (If in specific cases, ask respondent to indicate them)

Q.11.-   WHY DO YOU PREFER THIS SOURCE?

Q.12.- ARE YOU A MEMBER OF SOME PROFESSIONAL ASSOCIATION?

NO / YES

  Q.12.1.- WHICH?

  Q.13.- WHICH SERVICES OFFERED BY THEM DO YOU FIND
          MOST HELPFUL?

  Q.14.- DOES THE MEMBERSHIP INCLUDE THE SUBSCRIPTION
          TO ANY JOURNAL?

    NO / YES

      14.1.- WHICH?

      14.2.- DO YOU READ IT/THEM REGULARLY?

              YES / NO

      14.3.- WHY?

QUESTION 15.-

To keep up to date with developments,

DO YOU ATTEND ANY OF THE FOLLOWING?

Show card to respondent

Q.15.- COURSES?

NO / YES

Q.15.1.- How often?

Q.15.2.- Where?

Q.15.3.- Which subject?

Q.15.4.- WHY NOT?

Q.16.- CONFERENCES, MEETINGS, CONGRESSES?

NO / YES

    Q.16.1.- How often?

    Q.16.2.- Where?

    Q.16.3.- *Which subject?*

Q.16.4.- WHY NOT?

DO YOU DISCUSS ANY OF THE FOLLOWING WITH YOUR COLLEAGUES:

Show card to respondent

Q.17.- PARTICULAR CASES?

NO / YES

Q.17.1.- WHAT SORT OF CASES DO YOU DISCUSS WITH YOUR COLLEAGUES?

Q.17.2.- How often?

Q.17.3.- How do these discussions take place?

Q.18.- NEW DEVELOPMENTS IN DENTISTRY?

NO / YES

Q.18.1.- CAN YOU GIVE ME AN EXAMPLE?

Q.18.2.- How often?

Q.18.3.- How do these discussions take place?

QUESTION 19

Q.19.- OTHER PROFESSIONAL ISSUES?

NO / YES

Q.19.1.- CAN YOU GIVE ME AN EXAMPLE?

Q.19.2.- How often?

Q.19.3.- How do these discussions take place?

QUESTION 20

Because of your job/study DO YOU NEED TO CONTACT:

Show card to respondent,

Q.20.- INDIVIDUALS FROM OTHER PROFESSIONS/OCCUPATIONS?

NO / YES

Q.20.1.- Who are they?

Q.20.2.- Why do you contact them?

Q.20.3.- How do these contacts take place?

Q.21.- OTHER PROFESSIONAL ORGANIZATIONS?

NO / YES

Q.21.1.- Which are they?

Q.21.2.- Why do you contact them?

Q.21.3.- How do these contacts take place?

QUESTION 22

SECTION C   PERSONAL ORGANIZATION AND USE OF INFORMATION

Now, I am going to ask you a few questions about the use of dental literature and special materials.

Q.22.- DO YOU SUBSCRIBE TO ANY PROFESSIONAL JOURNALS?
(Excluding those coming with your membership to professional associations)

NO / YES
↓
Q.22.1.- WHICH?

Q.23.- DO YOU READ OTHER PROFESSIONAL LITERATURE?

NO / YES
↓
Q.23.1.- WHICH?

Q.24.- DO YOU READ LITERATURE IN ANY OTHER LANGUAGE?

NO / YES
↓
Q.24.1.- WHICH?

Q.24.2.- DO YOU FEEL THIS AS A BARRIER TO ACCESS
INFORMATION?

Q.25.- HOW MANY HOURS A WEEK YOU SPEND READING PROFESSIONAL
LITERATURE?

Q.26.- HOW DO YOU OBTAIN THE PROFESSIONAL LITERATURE YOU
READ?

Q.27.- DO YOU USE AUDIOVISUAL MATERIALS?

NO / YES

    Q.27.1.- WHICH?

    Q.27.2.- HOW DO YOU OBTAIN THEM?

Q.28.- DO YOU USE COMPUTER ASSISTED LEARNING PACKAGES?

NO / YES

    Q.28.1.- WHICH? (Subject; purpose)

    Q.28.2.- HOW DO YOU OBTAIN THEM?

QUESTION 29

The next group of questions is referred to how you organize all these materials.

Q.29.- DO YOU KEEP THE MATERIAL THAT YOU OBTAIN OR RECEIVE?

NO / YES

      Q.29.1.- HOW DO YOU ORGANIZE THESE MATERIALS?

Q.30.- IS THERE A COLLECTION OF BOOKS AND JOURNALS IN YOUR PRACTICE/UNIT?

NO / YES

      Q.30.1.- WHAT DO YOU COLLECT THERE?
              (The respondent should indicate
              subjects covered and kind of
              documents)

      Q.30.2.- HOW IS IT ORGANIZED?
              (Find out if there are catalogues/
              data bases/files/somebody in charge
              but DO NOT suggest possibilities)

      Q.30.3.- WHO USES IT?

QUESTION 31

Q.31.- DOES YOUR PRACTICE/UNIT HAVE ANY COMPUTING FACILITIES?

NO / YES

Q.31.1.- WHAT KIND OF FACILITY?

Q.31.2.- WHAT DO YOU USE IT/THEM FOR?

Q.31.3.- HOW SATISFIED ARE YOU WITH IT/THEM?

Please choose an option from the card

very satisfied
satisfied
neither satisfied nor dissatisfied
dissatisfied
very dissatisfied

Q.31.4.- WHY DO YOU FEEL THAT WAY?

SECTION D

SECTION D   USE OF LIBRARY AND INFORMATION SERVICES

        I am going to ask you some questions about the
        libraries and information services that you may use.

Q.32.- DO YOU USE ANY LIBRARY IN RELATION TO YOUR WORK/
        STUDIES?

NO / YES

        Q.32.1.- WHICH?

        Q.33.- CAN YOU DESCRIBE A SITUATION WHEN YOU USED
        ITS SERVICES?
        (The answer should cover: reason/time/service)

        NO / YES

        Which?

        Q.33.1.- HOW SATISFIED DID YOU FEEL?

        Please choose one option from the card

        very satisfied
        satisfied
        neither satisfied nor dissatisfied
        dissatisfied
        very dissatisfied

        Q.33.2.- WHY DID YOU FEEL THAT WAY?

        Q.33.3.- WHY NOT?

QUESTION 34

-21-

Q.34.- WHY YOU DON'T USE LIBRARIES?

Q.35.- HAVE YOU EVER APPROACHED ANY OF THE FOLLOWING FOR INFORMATION?

Show card to respondent

The BDA library	YES / NO
Federation Dentaire Internationale	YES / NO
Local health authority	YES / NO
District Drug Information Centre, at the Royal Hallamshire Hospital	YES / NO
Regional Drug Information Centre, at Leicester	YES / NO
Other	YES / NO

(Specify)..

Q.36.- If YES to all or any: WAS IT SUCCESSFUL?
Could you choose one option from the card?

successful
neither successful nor unsuccessful
unsuccessful

Q.37.- DO YOU HAVE A CURRENTLY VALID TICKET FROM THE HHL?

YES / NO
↓
Have you ever had one?

YES / NO
↓
When?.........

Since when?.........

Q.38.- HAVE YOU EVER USED THE INDEX TO DENTAL LITERATURE?

NO / YES

Q.39.- COULD YOU DESCRIBE A SITUATION WHEN YOU USED
IT?   (Find out reason/time/results)

Q.40.- DID YOU FIND IT?

Show card to respondent

very easy
easy
neither easy nor difficult
difficult
very difficult

Q.40.1.- WHY?

QUESTION 41

Q.41.- HAVE YOU EVER USED ANY OF THE FOLLOWING DATA BASES?

MEDLINE	YES / NO
EMBASE (Excerpta Medica)	YES / NO
DHSS DATA	YES / NO
SCISEARCH	YES / NO
PSYCHOLOGICAL ABSTRACTS	YES / NO
SOCIOLOGICAL ABSTRACTS	YES / NO
OTHER (Specify)	YES / NO

If NONE go to question 46

Q.42.- COULD YOU DESCRIBE A SITUATION WHEN YOU USED IT/THEM?
(Ask only one example; find out reason/time/results)
(If respondent does not remember ask for copy of the search)

Q.43.- DID YOU CARRY OUT THE SEARCH YOURSELF?

NO / YES

Q.43.1.- DID YOU USE?

your own computer/terminal   YES / NO

a terminal at your workplace   YES / NO

QUESTION 45

Q.44.- DID YOU ASK FOR THE SEARCH TO BE DONE FOR YOU?

NO / YES

Q.44.1.- DID YOU COMMISSION THE SEARCH FROM:

Show card to respondent

The HHL	YES / NO
The BDA library	YES / NO
The British Library	YES / NO
Other (specify)	YES / NO

QUESTION 45

Q.45.- DID YOU FEEL SATISFIED WITH THE RESULTS?

Could you choose one option from the card?

very satisfied
satisfied
neither satisfied nor dissatisfied
dissatisfied
very dissatisfied

Q.45.1.- WHY DID YOU FEEL THAT WAY?

Q.46.- HAVE YOU EVER NEEDED TO FIND INFORMATION ONLY
AVAILABLE IN AV FORM?

NO / YES
↓
Describe situation please

Q.47.- DID YOU HAVE ANY DIFFICULTY IN FINDING IT?

NO / YES
↓
Which?

QUESTION 48

SECTION E   PERSONAL

             Now, would you please tell me about your dental
             studies?.
             First of all,

Q.48.- PLEASE TELL ME WHEN YOU GRADUATED?
        YEAR:

Q.49.- WHERE DID YOU GRADUATE?
        Institution:

        Country:
        (If U.K. specify town)

Q.50.- HAVE YOU ANY OTHER PROFESSIONAL QUALIFICATIONS?

  NO / YES
          ↓
        Which? (Indication of each one, with year and place of
               graduation as above)

Q.51.-   ARE YOU, AT THE MOMENT, READING FOR EITHER A
         POSTGRADUATE DEGREE OR A PROFESSIONAL QUALIFICATION?

  NO / YES
          ↓
           ARE YOU DOING THIS FULL-TIME OR PART-TIME?

                   part-time   full-time
                                              ↓
        └─→ SECTION F ←────┘   SECTION G

TYPE OF PRACTICE

Also, I need to ask you a few questions about your present job.

Q.52.- WHERE DO YOU WORK MOST OF THE TIME?

Please mark option on this card

independent practice
hospital attached to Dental School WHICH?
hospital NOT attached to Dental School WHICH?
community dental service WHICH?
dental school WHICH?
other WHICH?

Q.53.- DO YOU WORK PART-TIME OR FULL-TIME?

part-time

full-time

Q.54.- Show card to respondent and ASK:

DO YOU WORK

with private patients only?   private practice

with NHS patients only?   NHS only

with private and NHS patients?   private + NHS
                                               (% of each?)

....
....
....

Q.55.- Show card to respondent and ASK:

Are you working alone?   solo practice

Are you a partner?   partnership
                                               (How many?.........)

Are you working in a group practice,
but you are not a partner?   group practice
                                               (How many?.........)

Q.56.- WHAT IS YOUR JOB TITLE?

Q.57.- HOW MANY PARADENTAL STAFF ARE THERE IN YOUR PRACTICE/
UNIT?. (Find out category; qualifications;part or full
time)

Q.58.- DO YOU CONSIDER YOUR PRACTICE TO BE:

general ┌─strictly specialised

both

│
↓
└─→Q.59.- WHICH SPECIALITIES DO YOU
COVER?
(Check with list)

Q.60.- DO YOU HAVE ANY "SPECIAL INTERESTS" ?

(It means anything in what the respondent might be
interested, not necessarily a specialty as
Orthodontics that requires special qualifications;
it could refer to a subject/kind of patient, etc)

SECTION G

CURRENT POSTGRADUATE STUDIES

I am going to ask about your current studies.

Q.61.- WHICH POSTGRADUATE DEGREE/PROFESSIONAL QUALIFICATION
ARE YOU READING FOR?

Q.62.- WHICH SPECIALITY/SUBJECT?

Q.63.- WHERE?

Q.64.- ARE YOU READING FOR THIS POSTGRADUATE DEGREE/
PROFESSIONAL QUALIFICATION BY?

Taught course	YES / NO
Research only	YES / NO
Private study	YES / NO
Clinical work	YES / NO
A combination (specify)	YES / NO

Q.65.- IS THIS COURSE?

FULL-TIME	YES / NO
PART-TIME	YES / NO

Q.66.- HOW LONG IS THE COURSE?................................

Q.67.- WHICH STAGE ARE YOU AT?................................

Questions 68 to 70 only for part-time students.
In the case of full-time students check that
the previous replies have covered these questions

Q.68.- WHAT KIND OF INFORMATION DO YOU NEED TO STUDY?

Q.69.-   HOW DO YOU OBTAIN THIS INFORMATION?

Q.70.-   HOW SATISFIED DO YOU FEEL ABOUT THE INFORMATION YOU
         OBTAIN IN THIS WAY?

         Could you choose an option from the card?

                   very satisfied
                   satisfied
                   neither satisfied nor dissatisfied
                   dissatisfied
                   very dissatisfied

Q.70.1.-   WHY DO YOU FEEL THAT WAY?

SECTION H   PRODUCTION OF INFORMATION

          Finally the next group of questions is about how you
          prepare either your publications or your lectures.

Q.71.-   DO YOU WRITE?
                         conference papers   YES / NO
                         lectures   YES / NO
                         reports   YES / NO
                         case reports   .   YES / NO
                         articles   YES / NO
                         books   YES / NO
                         other publications   YES / NO

         If YES to all or any HOW FREQUENTLY?

Q.72.-   DO YOU KEEP A FILE OF YOUR PUBLICATIONS?

   NO / YES

      | Q.73.-   COULD YOU GIVE ME A LIST OF THEM?
      | ————————————————————————————
      | YES / NO
      ↓
Q.74.-   DO YOU WRITE YOUR PUBLICATIONS   WITH   THE   HELP   OF   A
         COMPUTER?

         YES / NO
                   ↓
          | WHY NOT?
          |
          ↓
         HOW?

Q.75.   WHAT KIND OF INFORMATION DO YOU NEED, WHEN YOU WRITE?

Q.76.-   HOW DO YOU OBTAIN IT?

Q.77.- WHEN YOU PREPARE YOUR PUBLICATIONS, WHAT INFORMATION IS
        THE MOST DIFFICULT TO FIND?

Q.78.- HAVE YOU BEEN INVOLVED IN THE PRODUCTION OF
        AUDIOVISUAL MATERIALS?

 NO / YES

        ASK description: which; purpose; results;availability

        Q.79.- DID YOU NEED ANY INFORMATION WHEN YOU WERE
                PREPRARING THEM?

        NO / YES

            ASK which and how was resolved

Question 80

Q.80.- HAVE YOU BEEN INVOLVED IN THE PRODUCTION OF COMPUTER
SOFTWARE FOR DENTISTRY?

YES / NO
↓
End of questionnaire

ASK description: which; purpose; results; availability

Q.81.- DID YOU NEED ANY INFORMATION, WHEN YOU WERE
DOING THAT?

YES / NO
↓
End of questionnaire

ASK which and how was resolved