

**The development, implementation and evaluation of a
strategy to enhance nursing research in clinical nursing:
a realistic evaluation study**

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Glossary

CMO	Context-mechanism-outcome configuration
CN	Clinical Nurses
CUN	University Hospital of Navarra
EBP	Evidence based practice
EBM	Evidence based medicine
FG	Focus group
Group A & B	Intervention group of clinical nurses
Group C	Control group of clinical nurses
ICU	Intensive care unit
JC	Journal club
NC	Nurses' characteristics (attitudes' scale)
M	Mentor
MN	Mentors' network
NRDA	Nursing research development area
NRQ	Nursing research questionnaire
NRQB	Nursing research questionnaire B
PC	Personal characteristics
RC	Research capability
RCO	Research course
RR	Research relevance (attitudes' scale)
RRA	Research related activity
T0	T0 or Baseline phase
T1, T2, T3	Time 1, Time 2, Time 3
VR	Value of research for nurses (attitudes' scale)
WM	Ward managers
WMQ	Ward managers' questionnaire
WMS	Ward managers' seminar
6 ^{II} , 4 ^{II} , 3 ^a ...	Numbers of the different hospital wards

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Abstract

There is a growing interest in promoting nursing research in Spain, especially with the European Convergence of educational programmes and qualifications. The aim of this study was to contribute to the development of nursing research among clinical nurses in a Spanish hospital. To do so, it explored the nursing research culture in a hospital and, designed and implemented an intervention to increase nursing research by developing research capability and modifying inhibiting factors in the context.

This project followed a realistic evaluation approach. It was divided into three phases: baseline, development and evaluation. The baseline phase, conducted with clinical nurses and ward managers in a University Hospital, aimed at gaining an understanding of the nursing research culture in a hospital. This information was used for the development phase, which comprised the design and implementation of an intervention. The intervention, implemented over one year, consisted of the establishment of a mentors' network in the hospital, and an educational program with seminars, research methods courses and journal clubs. The evaluation phase was conducted to study the intervention outcomes looking at the contexts and the intervention mechanisms, through ward managers', clinical nurses' and mentors' views. Several methods of data collection, quantitative and qualitative, were used along the different phases of the study: self completion questionnaires, objective tests, scales and focus groups. The results indicated that the nursing research culture of the hospital developed moderately after the intervention as shown by an increase in participants' research capability (knowledge, skills and attitudes) and a decrease in some of the inhibiting factors identified in the baseline phase. The knowledge provided by this study helped to understand how a carefully designed intervention, based on an understanding of the context, could contribute to nursing research development. This intervention, and the understanding of why and how it worked, could be used as a model in other hospitals.

Introduction

Research has been defined as 'the search for new knowledge using scientific methodologies and approaches' (McCance et al 2007; R&D Office 1999, p. 27). Nursing, as a scientific discipline, needs to use the scientific method to develop its body of knowledge (McCance et al 2007; Pepler et al 2006; Velho 2004; Seymour et al 2003). In fact, the existence of an important amount of literature focused on nursing research shows an increasing awareness of the essential role that research plays in the development and growth of the profession. This can be especially noticed in USA, Canada, and UK, countries that are, at the time of writing, leading in the world's nursing research production (Serrano and Narvaiza 2000). The increasing interest in nursing research has been also spread to other developed countries, although its development and implementation vary between countries according to the educational level or professional recognition.

In Spain, nursing education has been integrated into the universities since 1977. This was the origin of significant changes for the profession. However, until the time of this study, educational policy had not recognised the relevance of studying research methodology in pre-registration nursing studies (Alberdi 2000). Thus, whether or not these aspects are included in the basic curriculum have exclusively depended on each nursing school and, therefore, many pre-registration/undergraduate nursing education programmes remain without providing research preparation (Fernández 2002). In addition, until 2007, nurses in Spain had no access to postgraduate education, Masters and PhD, which prevented them from achieving research competencies. These two factors have been a clear limitation for nursing research and, therefore, for professional development in Spain.

Thus, considering that the context has impeded nursing research development, in Spain, there is not a research tradition in nursing (Martínez 2003; Moreno-Casbas and Frutos-Sánchez 2002; Richart 1999; Icart 1999, 1998). A few studies have attempted to analyse the scientific nursing production in Spain summarising that many of the published papers were not empirical and out of the relatively few research studies, the majority were descriptive, with weak methodologies and low quality. Moreover, they noticed that most of the published papers were produced in nursing schools (Pértega-Díaz and Pita-Fernández 2008; Serrano and Narvaiza 2000).

All clinical nurses do not have to be interested or prepared to conduct research studies (Green et al 2008). However, it is neither something to do exclusively in academic environments nor by professionals in elitist positions, as has mostly happened (Edwards et al 2002). This fact has led to a situation in which the problems addressed in the research studies are not always the most relevant to clinical practice, increasing the existing research-practice gap. If the final aim of research is to generate a body of knowledge that helps to improve clinical practice, all nurses, independently of their academic level, should be aware of available research of their speciality areas to apply it and provide patients with the best available care (While and Taylor 2002). They are also in a privileged position to identify aspects of their daily work that need to be investigated through research studies. Thus, nurses could be involved in research activities in many different ways and levels, all of which are extremely important in the development of a research culture.

Nowadays, with the adaptation of nursing education to the requirements of the European Union Superior Studies Professional development, postgraduate education is possible for nurses in Spain. Therefore, there is a growing interest in promoting nursing research activity in this context as a means to develop the existing body of knowledge and clinical practice (Martínez Riera 2005; Germán 2004; Duran 2004, 2003; Moreno-Casbas and Frutos-Sánchez 2002; Gastaldo et al 2001; Alberdi 2000; Cabrero 1999; Fuentelsaz and Ramalle 1999).

In 1996, the Institute of Health Carlos III, part of the Spanish Ministry of Health that provides nationwide economic support for biomedical research, created the group Investen, which in 2000 became a formal structure, the Centre for Coordination and Development of Nursing Research (Investen-isciii). The main

objective of this center is to develop a national strategy to organise and facilitate the integration of nursing research into clinical practice, including the advice and training of professionals, research promotion and dissemination, and the coordination and development of projects (Moreno-Casbas and Frutos-Sánchez 2002). A Delphi study carried out in Spain in 2001, by the promoters of Investenciis, identified as a priority research area the study of specific strategies to improve nursing research in the Spanish context (Moreno-Casbas et al 2001). However, although many activities have been developed, to date, there are no Spanish studies related to this issue and caution is needed to transfer other countries' findings into the Spanish context, where the research culture is still emerging (Díaz et al 2004; Martínez 2003; Richart 1999). This thesis addresses the urgent need to develop a strategy to enhance nursing research activity in a Spanish hospital.

The report is organised into five chapters. In the first, the background to the study is presented. A literature review was conducted to obtain information about the situation regarding nursing research, the influential factors for its development and the different strategies implemented to promote research activity among clinical nursing.

The second chapter provides a detailed description of the design, i.e. realistic evaluation; the three phases of the study: baseline, development and evaluation; and the methods, namely focus groups and surveys, to collect and analyse data. The design and implementation of an intervention to promote nursing research in a hospital is also explained in this chapter.

The results of the study are presented in Chapter 3. The first section presents the results obtained from ward managers and clinical nurses in the baseline phase of the study, which informed the development of the intervention. A later section includes the evaluation results, obtained from ward managers, clinical nurses and mentors after the implementation of the intervention.

In Chapter 4, the strengths and limitations of the design and methodology used in the project are acknowledged. Subsequently, the findings are reviewed and discussed, identifying the key mechanisms of the intervention, the contextual factors that had influenced on them, and the study outcomes. At the end of the chapter, recommendations for policy making, clinical practice, nursing education

and further research are given. The final chapter offers a summary of the study and its specific contributions.

Chapter 1. Literature review

1.1. Aims of the literature review and search strategy

This project commenced with a comprehensive review of the literature. The aim of the literature review was to explore existing research at an international level to provide the scientific background for this study on nursing research, influential factors and attempts to develop it in clinical practice. This understanding of the situation guided the design and implementation of an intervention to develop nursing research.

The literature review was carried out using the electronic databases CINAHL and PubMed using the search terms 'nursing research', 'research capability', 'influential factors', 'development' 'interventions'. Synonyms were identified for each of these terms and combined using the Boolean operators 'AND' and 'OR' (Appendix 1).

The search included papers from 1998 to 2008 published in English and Spanish. Journal articles, research papers and reviews were included while anecdotes, responses and commentaries were excluded. Fifty seven articles were retrieved in Pubmed and 53 in CINAHL (Appendix 2). All the retrieved articles were assessed by the revision of the titles and abstracts to decide their relevance. Finally, the reference lists of all related articles were examined to identify any publications that were not detected in the previously described search.

In the following sections of this chapter some of the aspects relevant to this thesis are summarised to gain insight about nursing research activity, the influential factors and strategies to develop it in clinical practice.

1.2. Scientific background to the study

The value of research for the enhancement of the nursing profession has been assumed and there is a world-wide increasing interest among policy makers in promoting research related activities with nurses (Bonner and Sando 2008; Scott and Pollock 2008; Jackson 2005; Wilson-Barnett 2001). Research activities include not only conducting research studies but also other related activities such as, reading research, using material resources, research utilization in practice, elaborating practical guidelines and publicising research findings, within others (Díaz et al 2004; Kuuppelomaki and Tuomi 2003; Edwards et al 2002; Hundley et al 2000; Dyson 1997). However, most of the reviewed studies about nursing research have looked exclusively at one of the research related activities listed above: the research utilization, also called knowledge utilization, research use in practice, evidence-based practice, and knowledge translation (Scott and Pollock 2008; Pepler et al 2006; Pravikoff et al 2005; Kitson 2004; Pearson 2004; Ervin 2002; Harvey et al 2002; Kitson 2002).

The paradigm of evidence-based practice (EBP) has been introduced around the world with the aim of applying research results in practice and deliver care based on sound evidence of what works (Mohide and King 2005; Pravikoff et al 2005; Kitson 2004; Rycroft-Malone et al 2004; Fulbrook 2003; Krugman 2003; Valente 2003; Kitson 2002). The concept of EBP comes from evidence-based medicine (EBM). However, when talking about evidence-based nursing, it is important to bear in mind that the type of evidence adopted for EBM, mainly relying on research and, specifically, on randomised controlled trials, might not be the most appropriate for nursing. In evidence-based nursing, due to the different focus of the discipline, evidence comes from an array of sources: an integration of research-based evidence with clinical experience and patients' preferences (Reavy and Tavernier 2008; Schmidt and Brown 2007; Egerod and Hansen 2005; Fulbrook 2003; Krugman 2003; Ervin 2002; Thompson et al 2001a).

Over the past few years, considering its potential benefits for patient care, there is a growing concern about the development of evidence-based nursing. Nurses, at all levels, are increasingly expected to use evidence in their practice to improve the quality of care through the incorporation of relevant research (Hannes et al 2007; Roxburgh 2006; Ervin 2002; Kitson 2002). Therefore, most of the research on the issue has focused on the difficulties of applying research to practice, in an attempt to understand the reasons for the existing gap between research production and its utilization in nursing (Glacken and Chaney 2004; Hommelstad and Ruland 2004; Hutchinson and Johnston 2004; McKenna et al 2004; Pearson 2004; Bryar et al 2003; Kajermo et al 2001; Parahoo and McCaughan 2001; Retsas 2000; Dunn et al 1998; Hunt 1987). This is a very important issue because despite the increasing amount of research production, nursing practice remains reticent to apply research findings to inform decision making in clinical practice, existing a gap between *what is known* and *what is done* (Reavy and Tavernier 2008; Profetto-McGrath et al 2007; Meijers et al 2006; Estabrooks et al 2005ab; Angus et al 2003; Valente 2003; Scott 2002).

1.2.1. The research-practice gap and influential factors

Most of the authors who have tried to understand the reasons for the existing research-practice gap have achieved congruent results (Profetto-McGrath et al 2007; McKenna et al 2004). In 1987, Hunt identified several barriers to explain the slow application of research findings into practice. She concluded that nurses do not understand research, do not believe the research findings, do not know how to apply them and are not allowed to do so (McSherry 1997; Hunt 1987). Interestingly, 20 years later, many of these problems still appear to be the main barriers for nurses to use research findings in their practice (Pravikoff et al 2005).

These barriers to research utilization have been classified as: individual or personal barriers (educational level, interest and attitudes); organizational barriers (lack of time, lack of autonomy or authority and lack of support); the research itself (language, no relevant topics or complex statistics) and barriers related to the communication and accessibility to research results (Atkinson et al 2008; Hutchinson and Johnston 2006; Karkos and Peters 2006; Pravikoff et al

2005; Gerrish and Clayton 2004; Glacken and Chaney 2004; Hommelstad and Ruland 2004; Hutchinson and Johnston 2004; Bryar et al 2003; Kuuppelomaki and Tuomi 2003; McCleary and Brown 2003; Parahoo and McCaughan 2001; Kajermo et al 2000; Retsas 2000).

The instrument most frequently used in this kind of inquiry has been the Barriers Scale (Funk et al 1991). This instrument is based on Roger's model of Diffusion of Innovations, dating back to 1962. This model covers four dimensions that influence the diffusion of an innovation: characteristics of the adopter; of the organization or the setting; of the innovation; and characteristics of the communication (Roger 1983). Based on this model, The Barriers scale is a five point Likert scale composed of 29 items and divided into four subscales: 1- Characteristics of the nurse; 2-Characteristics of the setting; 3-Characteristics of the innovation; and 4-Characteristics of the communication. This instrument also includes an open-ended question about facilitators. Some of the studies that have used the barriers scale to gain an understanding of the factors that might prevent the utilization of research in nursing are summarised in Table 1.1 (Appendix 3 for more studies).

Table 1.1 Studies using the Barriers scale

Source	Title	Method	Sample	Key Results
Bryar et al (2003) UK	The Yorkshire BARRIERS project: diagnostic analysis of barriers to research utilization	Survey Descriptive	4501 nurses Response rate: 45%	Top barriers: 1-Lack of time to read and apply research 2-Lack of authority to change practice 3-Doctors' and other peers' lack of support 4-Statistical analyses not understandable
Hommelstad & Ruland (2004) Norway	Norwegian nurses' perceived barriers and facilitators to research use	Survey Descriptive	159 nurses (Operating room) (Random sample) Response rate: 51%	Top 5 barriers: 1-Relevant literature no compiled in one place 2-Insufficient time to implement new ideas 3-Physicians will not cooperate with implementation 4-Facilities inadequate for implementation 5-Research is not available Top facilitators: 1-Increasing accessibility of research literature 2-Making more time available
Hutchinson & Johnston (2004) Australia	Bridging the divide: a survey of nurses' opinions regarding barriers to, and facilitators of, research utilization in the practice setting	Survey Descriptive	761 nurses Response rate: 45%	Top 5 barriers: 1-Insufficient time to implement new ideas 2-Lack of awareness 3-Not enough authority to change practice 4-Inadequate skills 5-Lack of support for implementing findings Top facilitators: 1-More time 2-More relevant research 3-More support from managers and peers

Table 1.1 (continued)

Source	Title	Method	Sample	Key Results
Kuuppelomaki & Tuomi (2003) Finland	Finnish nurses' views on their research activities	Survey Descriptive	600 nurses (medical and surgical wards). Response rate: 67%	Top 5 barriers: 1-Research problems not relevant for practice 2-Not enough time to try out new ideas 3-It is difficult to understand the statistics 4-Not enough time to read research 5-Literature is not assembled in the same place
McCleary & Brown (2003) Canada	Barriers to paediatric nurses' research utilization	Survey Descriptive	528 nurses (paediatric hospital) Response rate: 33%	Top 5 barriers: 1-Not enough time to read research 2-The relevant literature is not compiled in one place 3-Statistical analyses are not understandable 4-Not enough authority to change practice 5-Insufficient time to implement new ideas
Parahoo & McCaughan (2001) UK	Research utilization among medical and surgical nurses: a comparison of their self reports and perceptions of barriers and facilitators	Survey Descriptive	2300 nurses (medical and surgical wards) Response rate: 52%	Top 5 barriers: 1-Not enough authority to change practice 2-Management will not allow implementation 3-Insufficient time to implement new ideas 4-Statistical analyses are not understandable 5-Physicians will not cooperate with implementation
Karkos & Peters (2006) USA	A magnet community hospital fewer barriers to nursing research utilization	Survey Descriptive	584 nurses Response rate: 47%	Top barriers: 1-Insufficient time to read research 2-No enough authority to change practice 3-Insufficient time to implement new ideas Top facilitators: 1-Access and availability 2-Education and communication 3-Practical application 4-Supportive environment

As these studies indicate, the principal influential factors for research utilization are quite consistent, independent of the contexts where they were conducted. The main barriers are the lack of time, lack of authority of nurses, lack of support from other colleagues and management, lack of skills and research knowledge and difficulties to access to the literature. The principal facilitators include more time, support, training and accessibility to research.

The studies included in this review hold several common limitations that should be taken into account. For instance, the response rates are quite low and no details about non respondents were provided. This could imply that respondents could have been the most motivated and interested in research and therefore, results would not be representative of the population, impeding generalization of the findings. In addition, surveys have been conducted in purposively selected hospitals and with convenience samples which prevents the extrapolation of results. Another common methodological limitation is that all the studies have relied on self-reports and there is a risk of potential bias associated to this method and social desirability (Hutchinson and Johnston 2006). Finally, it is necessary to highlight that some barriers that could be determinant in a specific context, namely cultural and organizational aspects, have not been explored as they used the same structured instrument.

It is important to notice that all the studies mentioned have mainly focused on barriers rather than on facilitators (Harvey et al 2002). A more positive approach considering the existing facilitators and the possibilities to increase them would be very interesting. Another important aspect to stress is that most of the studies have explored the barriers through quantitative approaches. A limited number of qualitative studies addressing barriers to EBP have been found (Hannes et al 2007; Roxburgh 2006; Adamsen et al 2003ab; McCaughan et al 2002). However, their principal findings have supported quantitative studies' results. For instance, Hannes et al (2007) used a grounded theory approach to the study of the barriers to EBP. They recruited 53 nurses working in different settings and conducted focus groups to study their perceptions. The major themes arising were: lack of time, difficult access to resources, hierarchical structure, lack of support from doctors and management, and lack of research skills (Hannes et al 2007); all of them consistent with previous research.

Therefore, despite the limitations of the studies, considering the important amount of literature focused on the barriers to research utilization, and the consistency of the results achieved along the years (Atkinson et al 2008; Profetto-McGrath et al 2007; Wells et al 2007; Hutchinson and Johnston 2006; Sams et al 2004), it seems that those have been over studied and that it is time to take a step forward and start intervening on them.

1.2.2. Research capability of nurses

The majority of the studies that have tried to understand further the determinant influential factors for EBP have been focused on the personal/individual characteristics of the nurse. These include the nurses' interest and attitudes towards research, the research knowledge, skills, and experience. All these characteristics could be grouped under a broader concept entitled nurses' research capability (McVicar and Caan 2005).

For instance, a great number of authors have studied the relationship between nurses' attitudes towards research and their involvement in research activities (Bonner and Sando 2008; Díaz et al 2004; Veeramah 2004; Olade 2003, 2002; Davies et al 2002; Bjorkstrom and Hamrin 2001; Parahoo et al 2000; Upton 1999ab; McSherry 1997). Some of these studies are summarised in the following Table 1.2.

Table 1.2 Studies of nurses' attitudes towards research

Source	Title	Method	Instruments	Sample	Key results
Olade (2003) USA	Attitudes and factors affecting research utilization	Survey	Questionnaire (closed and open-ended questions): 1-Demographics 2-Attitudes scale 3-Participation in research	Convenience sample: 106 nurses (rural settings) Response rate: 88%	23% had favourable attitudes Attitudes and interest varied with levels of education and position 76% desired research utilization 41% had participated in research
Parahoo et al (2000) UK	Research utilization and attitudes towards research among learning disability nurses in Northern Ireland	Survey	Questionnaire: 1-Attitudes scale 2-Research related activities	Convenience sample: 87 nurses (2 disability hospitals)	Nurses held positive attitudes. A minority believed that research is not relevant to their work. 25% of nurses reported using research frequently.
Veeramah (2004) UK	Utilization of research findings by graduate nurses and midwives	Survey	Questionnaire: 1-Academic and professional profiles 2-Utilization of research 3-Attitudes scale 4-Open questions of EBP	Convenience sample: 340 nurses and midwives Response rate: 51%	The majority had positive attitudes. Attitudes related to research education. A large number reported using research findings in practice.

Most of the studies used quantitative approaches to study attitudes, with scales or structured questionnaires, and these instruments included aspects such as, research interest, awareness and motivation to participate. The principal limitations of the studies are that they used mainly convenience samples, achieved low response rates and relied exclusively on self-report methods, with the risk of obtaining socially desirable answers. Moreover, despite the important number of instruments available to measure nurses' attitudes towards research (Veeramah 2004; Bjorkstrom and Hamrin 2001; Hicks 1996), a systematic review recently conducted to analyse them (Frasure 2007), concluded that most of the tools lack a theoretical model (Bjorkstrom and Hamrin 2001) or have not reported their psychometric properties (Kuuppelomaki and Tuomi 2003).

Regarding the principal findings of the studies, it could be said that nurses, with an exception found in those working in rural areas (Olade 2003), hold positive attitudes towards research, especially highly qualified nurses. Although this is an encouraging finding, it is noticeable that although nurses might be interested and motivated in research, it is not directly translated into a high involvement in research activities (Roxburgh 2006; Adamsen et al 2003ab; Parahoo and McCaughan 2001; Parahoo et al 2000; Van Mullem et al 1999). This should be taken into account when planning an intervention with the aim of increasing nurses' research participation through the improvement of their attitudes, awareness and interest.

Other factors identified as determinant for nurses' involvement in research activities are their research level of knowledge and skills. In fact, most of the studies reviewed have taken these variables into account when studying research utilization and nurses' attitudes towards research. They concluded that an important barrier for nurses was the lack of knowledge and understanding of research and that research education could help to develop their research interest and awareness (Roxburgh 2006; Olade 2004; Shelden et al 2004; Veeramah 2004; Adamsen et al 2003a; Bryar et al 2003; Van Mullem et al 1999; Greenwood and Gray 1998; Le May et al 1998; Carroll et al 1997; Dyson 1997; McSerry 1997). Thus, it could be suggested that research educational programs are essential to increase research capability and, therefore, the ability of nurses to participate in research related activities (McCance et al 2007; Egerod and Hansen 2005; Pravikoff et al 2005; Shelden et al 2004; Lacey 1996).

1.2.3. Interventions to enhance nursing research

Many studies have investigated the barriers for EBP; however, fewer have addressed innovative strategies to overcome them. Several authors have proposed targeted interventions for overcoming the barriers in implementing evidence-based practice (Schmidt and Brown 2007; Pepler et al 2006; Gerrish and Clayton 2004; Valente 2003; Maljanian et al 2002; Melnyk 2002; Kajermo et al 2001; Melnyk et al 2000). For instance, strengthening beliefs among nurses about the benefits of EBP; teaching the basics of EBP; implementing journal clubs and organising research roundtables (Larkin et al 2007; Maljanian et al 2002; Melnyk 2002). Another widely accepted initiative has been the creation of nursing research committees in hospitals to promote and support research utilization (Larkin et al 2007). Other authors proposed educational programmes focused on dissemination and utilization of research findings in clinical practice, and research skills development (Pepler et al 2006; Pravikoff et al 2005; Kajermo et al 2001).

All these proposed strategies seem to be promising to overcome some of the principal barriers to EBP. However, there is no strong evidence to support any single approach (Pearson 2004) as those have not been formally evaluated. Moreover, as Pepler et al concluded (2006), a more comprehensive strategy, with numerous initiatives, is required to facilitate EBP.

Fewer authors have taken a step toward implementing and evaluating different strategies to facilitate research utilization by nurses in practice (Wells et al 2007; Fink et al 2005; Cullen and Titler 2004; Sams et al 2004; Happell et al 2003; Bero et al 1998) Fink et al (2005) implemented multiple organizational strategies and they found that journal clubs were one of the key activities to enhance research utilization among clinical nurses (Fink et al 2005). Other researchers developed internship programs with the goal of assisting nurses to base their practice on the evidence and to develop themselves professionally (Wells et al 2007; Cullen and Titler 2004; Happell et al 2003) and found them helpful in increasing nurses' use of resources, skills to implement research findings and in changing their attitudes towards EBP (Wells et al 2007).

When looking at interventions to develop nursing research activity in general, and not exclusively the research utilization in practice, it was noticed that the

availability of papers decreased substantially, as the principal focus of research has been to overcome the barriers to EBP. Few papers with interventions to promote nursing research activity among clinical nurses have been found in this literature review. Some conducted with nursing students or in academic nursing schools were found, but not with clinical nurses (Green et al 2008; Segrott et al 2005; Ax and Kincade 2001; Cooke and Green 2000). The following Table 1.3 summarises the three identified intervention studies undertaken to increase the research activity among clinical nurses.

Table 1.3 Interventions to develop nursing research activity in clinical nursing

Source	Title	Method	Instruments	Sample	Intervention	Key results
Adamsen et al (2003a) Denmark	Moving forward in a role as a researcher: the effect of a research method course on nurses' research activity	Exploratory Descriptive	Semistructured interviews	Clinical nurses from 30 hospitals 2 groups: G1-Nurses who participated in the course, n=37 G2- Nurses who didn't participate, n=42	Educational programme: One year research course -Scientific theory -Literature searchers -Critical reading -Basic statistics -The research process -Research methods -Ethics -The researchers' role	<i>Involvement in research projects: G1: 90%; G2: 35%</i> <i>Lack of time as a barrier. G1: 13%; G2: 50%</i> <i>Future intentions/plans in G1:</i> 95% wish to pursue future research projects 89% expected to implement results in practice Barriers: -Insufficient research competencies and skills -Lack of support from managers -Resistance and jealousy from colleagues
Clifford & Murray (2001) UK	Pre- and post-test evaluation of a project to facilitate research development in practice in a hospital setting	Three phases: 1-Pre-test survey 2-Research development activities 3-Post-test survey	Questionnaire Focus groups	<u>Pre tests:</u> All nurses and midwives in the trust, N=473 <u>Response rate:</u> 50% <u>Post-test:</u> Respondents in pre-test phase, N=235 <u>Response rate:</u> 56%	Research fellow from University Two strands: 1- Educational programme 2- Staff involvement in clinical research projects	No significant differences before and after on nursing research development. No significant differences in attitudes. Positive before and after the intervention. No differences before and after in research reading habits. Higher involvement in research activity after the intervention Higher perception of research impact on practice after the intervention.
Hundley et al (2000) UK	Raising research awareness among midwives and nurses: does it work?	Quasi-experimental Phase 1: baseline Phase 2: Intervention Phase 3: evaluation	Questionnaire	<u>Convenience.</u> <u>Intervention group:</u> staff in obstetrics and gynaecology, N=347 <u>Control group:</u> staff in oncology and haematology units N=188 <u>Response rate:</u> Phase 1: 81% and 74% Phase 3: 78% and 70%	Education and training programme	Research awareness: average in both groups at phase 1 and 3. Research attitudes: average in both groups at phase 1 and 3. Attitudes towards research active peers: good in both groups at phase 1 and 3. No differences in barriers A significant increase in knowledge and use of research resources, also in control group. Intervention group more likely to use research resources.

These studies involved a population of clinical nurses, a combination of clinical nurses and midwives in two cases, and used different methods for data collection. The first study used a qualitative approach for data collection in form of semi-structured interviews, while the other two studies included both qualitative and quantitative data to evaluate the intervention outcomes. In all the studies, the intervention included an educational programme. The aims and methodologies of the studies differed and these will be described separately in the following paragraphs.

Adamsen et al's (2003a) study aimed to provide information about the effect of a research course on participants' perceptions about their research competency and the barriers to conduct research activities, within others. They implemented an extensive and comprehensive research educational programme which enabled nurses to develop their own research proposal/projects. The course achieved the objectives of reinforcing the self-confidence of clinical nurses in research. Some differences among group 1 (G1) and group 2 (G2) were found regarding their involvement in research activities and their perceptions on barriers. An interesting finding was the resistance and jealousy from nurses' colleagues reported by G1, a barrier that was not clearly identified in previous studies. Nevertheless, several limitations can be found in the study. They used two different approaches for data collection, face-to-face interviews for nurses in the course and telephone interviews for nurses in G2, achieving a response rate of 95%. Both approaches have strengths and limitations; however, it is difficult to make a comparison of both groups because differences could have been influenced by the approach followed. In fact, a recognised bias for face-to-face interviews is obtaining socially desirable answers, and therefore, attributing the better results in G1 to the educational programme could be questioned. Moreover, the sampling strategy and the methodology of the study are not the most adequate to evaluate an intervention and establish clear conclusions about its impact, although the authors recognised this, drawing appropriate conclusions. Considering the well designed educational programme, it would have been very interesting to have some information about the development of nurses' research capability: research skills and knowledge. Moreover, no follow up of the achievement of nurses' intentions for future projects was provided.

Clifford and Murray's (2001) study aimed at developing the nursing research agenda in a hospital. To do so, they planned an intervention based on the

literature review. They established links between academics and clinical settings, creating a university team, the research fellow, who worked collaboratively with clinical nurses and midwives. The intervention included an educational programme and the active involvement of nurses in the development of research studies, with the support of the research fellow, to help them to gain insights in the research process. Few people participated actively in the intervention activities. The educational programme had two parts: open learning material on research and tutorial. While a large number accessed to the materials, only 14 nurses attended the tutorials. Regarding the participation in small scale research studies, 25 nurses decided to participate. The intervention impact was measured by completion of data before and after it, three years later. The results of the study did not show evidence of a development of nursing research due to the intervention. The educational open material with tutorial support did not seem to be enough to enable nurses to participate actively in research. Result that indicates that much greater research knowledge and experience might be needed for nurses to be 'doing' research. This study has several limitations that need to be highlighted. Regarding the methodology, an experimental or quasi-experimental approach would have been the most adequate to evaluate the intervention impact. In this study, there was no control group, which reduces the possibility to appraise the intervention outcomes. Moreover, the low response rate achieved at both, pre and post-test phases, compromises the possibility to generalise results to the population. Besides, no evidence of the impact of the strategy in non respondents was provided. Another aspect to consider in this project is that the contextual factors were not studied before planning the intervention, and, as the authors recognised, there was a lack of a research culture in the hospital at that moment, and the development of research activity was not a priority.

The third study included in the table (Hundley et al 2000) aimed at increasing an aspect of nurses' research capability, their research awareness, and an educational programme was designed with this goal. It was a quasi-experiment with control and intervention groups. The educational and training programme was different for control and intervention nurses. The programme available to all staff was a research workshop and a short intensive research course, while the one for intervention nurses was more extensive. It covered aspects such as, clinical appraisal skills, changing culture, awareness rising, and access to facilities. Results indicated that attitudes in both groups were positive before and

after the intervention, however, this fact was not translated into an active participation in research activities. This study achieved modest outcomes, although it suggests that nurses' use of resources can experiment a modest increase with targeted interventions, not only for intervention but also for control nurses. The principal limitation of this study was the time of the intervention, six months, which was too restricted to show long term outcomes of the intervention.

Thus, as it has been explained in these studies, the few attempts described to help increase research awareness and research activity among clinical nurses have included an educational intervention (Adamsen et al 2003a; Clifford and Murray 2001; Hundley et al 2000; Burrows and Baillie 1997; Lacey 1996). This supports other authors' views who, although without implementing any intervention, also considered that research educational programs were essential to develop the research interest and awareness among nurses (Egerod and Hansen 2005; Olade 2004; Shelden et al 2004; Veeramah 2004).

Some authors also highlighted the importance of enhancing the collaboration between the academics and practitioners as a way to reduce the research-practice gap and to promote nursing research and development (Jinks and Green 2004; Olade 2004; Seymour et al 2003; Melnyck 2002; Melnyck and Fineout-Overholt 2002; Clifford 1997). In fact, the intervention designed by Clifford and Murray (2001) was based on this collaboration. As Shelden et al stated (2004) 'having effective research mentors may be the most effective way to educate nurses in research skills' (Shelden et al 2004, p. 119). And, to date, at least in Spain, most of the research experts in nursing, who could play the role of mentors, develop their professional career in a university.

Other authors have suggested that interventions aimed at developing research in clinical nursing should include ward managers (Roxburgh 2006; Hundley et al 2000; Caine and Kenrick 1997), as nurses usually seek the support of their immediate managers. In fact, one of the main barriers to EBP, identified in previous studies, has been the lack of support of managers (Hutchinson and Johnston 2004; Parahoo and McCaughan 2001). Thus, strategies should take this into account exploring ward managers' understanding of their functions in facilitating and promoting research and enabling them to perform their role adequately.

It is important to highlight that the interventions to develop nursing research, included in this review, were mainly focused on nurses' research capability, without considering other contextual characteristics that could be determinant. Moreover, they were planned exclusively from the literature review, regardless of the existing culture in the organizations where they were being implemented. These might be some of the reasons why they achieved very moderate outcomes. The contextual characteristics and the culture of the organization are factors that need to be considered (Fink et al 2005; Pravikoff et al 2005; Gerrish and Clayton 2004; Kajermo et al 2001). As Le May et al stated in 1998 'It is crucial that strategies for introducing research, and initiating and managing the associated changes in clinical practice are grounded in an appreciation of the research culture existing in the organization amongst clinical nurses and their managers. Without this knowledge, valid and well structured strategies may founder through apathy, indifference or opposition' (Le May et al 1998, p. 429).

Therefore, it could be concluded that, despite advances in the identification of barriers and strategies to overcome some of them, there is still a need to develop additional strategies, grounded in an understanding of the context, to overcome barriers and introduce facilities to help encourage the development of nursing research (Maljanian et al 2002). It is also necessary to conduct more empirical studies to implement them and evaluate their effects on nurses' capability and on facilitating the development of a research culture in health care organizations. Moreover, these studies would be helpful to understand how the process differs between geographical settings (Segrott et al 2005).

1.2.4. The organizational culture

The development of nursing research and the change to a research-based profession are complex issues (Rycroft-Malone 2008; Kajermo et al 2001). Clinical nurses, although interested and motivated in research participation, face important barriers that prevent them from becoming research active (Pepler et al 2006; Clifford and Murray 2001; Hundley et al 2000; Rodgers 2000; Le May et al 1998; Kitson et al 1996) because the relationship between research capability and research activity is complex (Martinez Riera 2005; Bjorkstrom and Hamrin 2001; Clifford and Murray 2001). Whether nurses are involved in research activities is not exclusively dependent on their individual factors or capability.

There are other general factors, related to the organizational characteristics, that do have an impact on this relationship (Rycroft-Malone 2008; Pepler et al 2006; Pravikoff et al 2005; Gerrish and Clayton 2004; Bryar et al 2003; Davies et al 2002; Kitson et al 1996).

Some authors have tried to explore the contextual factors and their influence on, again, a specific aspect of research activity, research utilization in practice. They used the PARIHS framework, Promoting Action on Research Implementation in Health Services, presented by Kitson et al (1998) and modified and used by several authors (Cummings et al 2007; Larkin et al 2007; McCormack et al 2002). This framework argues that three major elements influence research implementation: the evidence, the context, and the type of facilitation needed to ensure successful change. Context is defined as 'the environment or setting in which the proposed change is to be implemented' (Kitson et al 1998, p.150) and it is composed of three dimensions: culture, leadership and evaluation. 'These dimensions include a value-oriented learning culture that is receptive to change; clear, transformational leadership that supports teamwork and staff involvement in decision making; and evaluation of various levels of performance with effective feedback mechanisms' (Cummings et al 2007, p. 27).

Using the PARIHS framework, Cummings et al (2007) conducted a cross-sectional survey in a hospital in Canada to determine the influence of organizational characteristics and context on research. They found that the characteristics of the context influenced research utilization by nurses. Positive characteristics were staff development, opportunity for nurse-to-nurse collaboration, and staffing and support services, concluding that nurses working in contexts with a more positive culture, leadership and evaluation, reported significantly more research utilization.

Meijers et al (2006) used the same framework as the theoretical structure of a systematic review that examined relationships between contextual factors and research utilization. Six contextual factors were identified as being statistically related to research utilization: the role of the nurse, multi-faceted access to resources, organizational climate, multifaceted support, time for research activities and provision of education.

Thus, placing the responsibility of the failure to research utilization on the individual is misguided (Rycroft-Malone 2008; Scott and Pollock 2008). Health professionals work in complex organizational structures and there are factors that do not depend on the individual but have an influence on research utilization. In other words, more effort should be focused on understanding how organizational culture might affect research development (Fink et al 2005; Scott-Findlay and Golden-Biddle 2005). Although the studies mentioned above were exclusively focused on the influence of contextual factors on research utilization, when the study scope is broader, the influence of contextual factors on the development of nursing research related activities in general; many of the aspects mentioned earlier will be still relevant.

Behind these factors, there is a determining aspect, the organizational culture (Scott-Findlay and Pollock 2008; Scott-Findlay and Golden-Biddle 2005). The organizational culture, understood as the implicit values and taken-from-granted assumptions of a group in an organization (Tregunno 2005), shapes the research use by influencing the professionals' attitudes and behaviours, 'providing a context where particular ideas, activities or events are more highly valued than others' (Scott and Pollock 2008, p.299).

Of the few frameworks to help understand organizational culture, one of the most well known was proposed by Schein (1992). He suggests a hierarchical and iterative model of three levels: 1-*Observable artefacts*, the most observable elements of an organization; 2-*Values*, articulated by norms, principles and ideologies; and 3-*Basic underlying assumptions*, the deepest level of culture. Several authors provided empirical data drawing on this model to understand the influence of the organizational culture in practitioners' research use.

Scott-Findlay and Golden-Biddle (2005) applied this framework to explore the cultural reasons that prevented acute care nurses from translating research findings into practice. They applied one of the dimensions that, according to Schein (1992), is within the underlying assumptions of an organizational culture, the 'nature of activity'. There are two extreme orientations regarding how work is valued: a *doing* orientation, focused on tasks and on efficiency, and a *being* orientation, focused on other values implying reflection. In health care organizations the prevalent orientation is towards *doing*, more valued than reflection, and this assumption underpinning activity, guides research utilization

through: how work is completed; the types of knowledge valued and used, and the provision of contexts for interaction (Scott-Findlay and Golden-Biddle 2005). For instance, nurses are expected to have things done rather than reflecting, which implies that research is not valued. Moreover, this orientation is more associated with practical knowledge than research knowledge, indicating the type of knowledge more valued in the organization. Besides, if the basic assumptions are orientated towards *doing*, then managers do not facilitate 'space' for reflection and interaction, showing that managers do not even expect nurses to be using research in their practice. These authors concluded that the cultural orientation towards *doing* did inhibit research utilization in practice (Scott-Findlay and Golden-Biddle 2005).

This was confirmed and completed in a later ethnographic study conducted by Scott and Pollock (2008). In addition to the three aspects previously discussed, they identified that the hierarchical structure of authority was extremely significant for the research use in an organization. They found that the top-down decision-making approach encourages passivity among nurses and unwillingness to use evidence-based practice.

Thus, 'developing a climate in which research is not only valued and seen for its intrinsic worth, but is also considered an integral aspect of routine activity in an organization' (Thompson 2003, p. 143), in terms of Schein's work (1992), an organization in which 'the nature of activity' is more oriented towards *being*, with a less hierarchical structure of authority; are important organizational factors to bear in mind if there is an interest in developing nursing research.

1.2.5. Nursing research in Spain

Most of the studies included in this review have been conducted in the UK, Canada and USA, as these are the main research producers world-wide and now are concerned with the fact that their results are not properly applied in clinical practice. The findings of these studies should be taken with caution when trying to translate them to other contexts where there is not such a research tradition. They have been exclusively focused on a specific aspect of research activity, the research utilization in practice, which may not have the same relevance in other countries where nursing research is less developed (Pértega-Díaz and Pita-

Fernández 2008; Velho 2004; Moreno-Casbas and Frutos-Sánchez 2002). Therefore, the approach to studying the issue needs to be wider, trying to look at nursing research activity in general and not exclusively at research utilization. This is the case in Spain.

Therefore, this literature review sought to identify empirical papers relevant to the situation regarding nursing research in Spain and only one published research study related to this issue was identified (Díaz et al 2004). The rest of the retrieved Spanish articles were discursive papers or editorials but not empirical studies. The following Table summarises the principal characteristics and results of this study (Table 1.4).

Table 1.4 Spanish study of nursing research in Spain

Source	Title	Objectives	Method	Instruments	Sample	Key results
Díaz et al (2004) Sevilla	Producción científica de los profesionales de enfermería en un hospital de tercer nivel (Nursing scientific production in a tertiary hospital)	1-To establish a diagnosis of the scientific activity undertaken by nurses, looking at the research production, attitudes, preparation and barriers 2-To establish the priority nursing research areas in the hospital.	Descriptive	Questionnaire: 22 items : -Demographics -Attitudes -Knowledge -Use of resources -Obstacles Documents scientific production of the last 4 years	Total population of nurses, N=1680. Response rate: 41%	Results 70% interested in research. 80% lack research knowledge. 77% didn't consider research important for the profession. 10% participated in research. Main barriers: - Lack of time - Lack of knowledge - Lack of interest Conclusions A change of culture is needed.

The paper included in this table is a descriptive study that tried to diagnose nurses' research production and research activity in a hospital. It also suggests strategies that may help to create a climate to enhance research activities among clinical nurses. The study has several limitations that should be considered. For instance, the instrument used was developed by the authors and details regarding its contents and development process were not provided. Moreover, rigour issues of validity and reliability were not mentioned. In addition, the study was carried out in one hospital, which together with the low response rate, compromises the possibility to generalise results.

Despite these limitations, it is highly interesting to note the different approach taken in this study of nursing research. Instead of just looking at the use of research findings in practice, as most papers conducted in other countries had done (Roxburgh 2006), the study tries to gain an overall picture of the research-related activities, which also may include the research utilization but as one activity among others. It is extremely important to make this distinction because nurses could be carrying out several research activities without necessarily implementing research results in their clinical practice (Roxburgh 2006).

Some peculiarities were found in this Spanish study regarding its results and conclusions. The principal barrier identified, the lack of time, was congruent with other studies' results (Hommelstad and Ruland 2004; Hutchinson and Johnston 2004; Bryar et al 2003; McCleary and Brown 2003; Parahoo and McCaughan 2001). Nevertheless, there were some differences in the rest of the barriers identified. In previous studies, conducted in other countries, the principal barriers were the lack of time, lack of support and authority to change practice and the lack of research accessibility (Table 1.1). Most of these obstacles referred to the characteristics of the nurse but also to the characteristics of the setting. In this study, those obstacles were mainly related to nurses' individual characteristics, such as the lack of knowledge, interest and negative attitudes towards research. Although, doing a precise comparison between countries is not possible due to the studies limitations and the use of different instruments and methodologies, these findings point to the existence of some differences in the barriers identified for the Spanish context, probably as a result of the lack of research tradition in this country. Nevertheless, this issue will need to be further explored. As Diaz et al (2004) concluded, a change of culture regarding nursing research is necessary in Spain and it is essential to study further the existing situation of nurses'

research capability and capacity before trying to design and implement strategies to promote research among clinical nursing in this context.

1.2.6. Main gaps found in the literature

Most of the reviewed studies failed to offer a comprehensive view of nursing research or research-related activities of clinical nurses, as they focused on research utilization (Gerrish and Clayton 2004; Hommelstad and Ruland 2004; Hutchinson and Johnston 2004; McCleary 2003; Retsas 2000; Kajermo et al 2000; Retsas and Nolan 1999; Dunn et al 1998; Kajermo et al 1998).

The majority of the studies were conducted in the UK (Veeremah 2004; Parahoo 2000; Rodgers 2000; Parahoo 1999; Camiah 1997), EEUU (Olade 2004; Bero et al 1998; Carroll et al 1997; Funk et al 1991), Canada (McCleary and Brown 2003) and in the Nordic countries (Oranta et al 2002; Bjorkstrom and Hamrin 2001; Kamwendo and Tornquist 2001; Kajermo et al 2000, 1998). Therefore, their results are based on very different contexts and this should be considered when trying to apply them in other countries with different backgrounds. Moreover, most of the published studies have similar limitations as they were merely descriptive and used small, non-representative samples.

Regarding the Spanish literature, there were many discursive papers about nursing research, its importance, and nurses' superior education (Martínez Riera 2005; Amezcua 2003b; Gastaldo et al 2001; Serrano and Narvaiza 2000; Fuentelsaz and Ramalle 1999; Escobar et al 1996). However, only one Spanish research study about these issues was retrieved (Díaz et al 2004). More knowledge about nursing research in this context is urgently needed, especially nowadays with the European Convergence.

It is also important to notice that, although the issue is complex enough, most of the authors have used exclusively quantitative approaches to its study. Only a few have tried to gather more holistic information using qualitative data to offer a more comprehensive view on the situation (Adamsen et al 2003ab; Davies et al 2002; Ax and Kincade 2001; Thompson et al 2001ab; Le May et al 1998). More multi-method studies would be very helpful to clarify some aspects by studying them in more depth.

Another gap found in the literature is that, although ward managers have been identified as key agents with great responsibilities in fostering or hindering research activities within nurses, to date, their perceptions have mostly been ignored (Roxburgh 2006; Parahoo and McCaughan 2001; Kajermo et al 2000). Thus, the study of the barriers and facilitators to research activity from the managers' point of view would be very interesting.

In addition, a few interventions to enhance nursing research activities, especially research utilization, have been documented (Olade 2004; Melnyk et al 2000; Taylor-Piliae 1999), although a comprehensive and realistic strategy has not been designed yet. Only a few studies reported modest attempts to implement interventions and evaluate them (Clifford and Murray 2001; Hundley et al 2000; Dyson 1997). However, these studies mainly introduced single interventions, focused on nurses' research capability, but not a whole strategy taking the contextual characteristics into account.

When looking at nursing research activity, most of the studies have not taken into account the whole organization and its characteristics. This is also important because, although nurses were prepared and motivated to be involved in research activities and incorporate the findings in their practice, if the culture of the organization is reticent to research and to change this will discourage and stop any activity (Greenhalgh et al 2004; Edwards et al 2002; Melnyk et al 2000). Many authors have stated that the contextual factors and organizational culture are crucial determinants to nurses' participation in research activities (Scott and Pollock 2008; Scott-Findlay and Golden-Biddle 2005; Thompson 2003; Thompson et al 2001a).

In conclusion, despite the important amount of literature on the subject of nursing research, many gaps have been identified. The study of some of the issues previously mentioned should be the starting point to design a strategy with the aim of enhancing nurses' research activity.

The study

This project tries to overcome many of the gaps identified through the literature review. Its main focus is nursing 'research activity' and 'research capability'. In this study, the concept 'research capability' includes: nurses' demographic data, professional and academic profiles, interest and attitudes towards research, research training, knowledge and skills. These variables were identified through the literature review as important due to the relationship that they seem to have with nurses' research activity.

The concept 'research activity', also called 'research related activity', is understood as any scientific activity conducted by nurses, including: reading, conducting or participating in studies, using research results in practice, using material resources, elaborating practical guidelines, publications activities, and participation in conferences, within others (Díaz et al 2004; Kuuppelomaki and Tuomi 2003; Edwards et al 2002; Tanner and Hale 2002)

This study also explores the influential factors for nursing research development, barriers and facilitators. As explained above, in this study it was presumed that the research capability and research activity were related, but that there were other factors, contextual factors dependent on the organizational culture, that would interfere in this relationship. This could be also called the 'research capacity', which relates to the ability to conduct research (McCance et al 2007) considering the wider context within which individuals operate. Therefore, it addresses not only individual issues, or research capability of nurses, but also other factors such as time and funding, support, cultural values and the type of research being undertaken (Segrott et al 2005; Fyffe and Hanley 2002; Scott 2002; Cooke and Green 2000). The concept research capacity has not been well defined (Tanner and Hale 2002) and the terms research capacity and research culture are used many times as synonyms in the relevant literature

In short, this project explores the 'nursing research culture' in a hospital in Spain looking at nursing research capability, research activity, and the influencing factors, barriers and facilitators, according to clinical nurses' and ward managers' point of views. This information is used to design and implement an intervention aimed at developing nursing research activity by increasing nurses' research capability and the research capacity in the hospital. A realistic evaluation approach is used to evaluate the outcomes and to understand how the intervention worked, paying special attention to the contextual influences (Appendix 4).

Aims of the study

The principal aim of this study is to contribute to the development of nursing research among clinical nurses in a Spanish hospital. To do so, it will explore the nursing research culture or capacity in a hospital and design and implement an intervention to increase nursing research activity by developing nurses' research capability and modifying the principal inhibiting factors identified in the context.

The specific objectives of this study are:

1. To explore the nursing research culture/capacity of the Hospital studying the nursing research capability and the research related activity in the whole organization, as well as the relationships between them.
2. To determine the contextual influential factors, barriers and facilitators, to nursing research development, according to nurses', and ward managers' point of view.
3. To compare the situation regarding research activity and nurses' capability in the different sites of the hospital.
4. To design a comprehensive intervention to increase clinical nurses' research capability and the research capacity, modifying some of the inhibiting contextual factors.
5. To implement the intervention in the different sites of the hospital.
6. To provide a detailed description of the implementation and the impact of the intervention by following a realistic evaluation methodology.
7. To analyse the appropriateness of realistic evaluation methodology for the study of the implementation of a complex intervention.

Chapter 2. Methodology

The methodology chapter provides a detailed description of the design, i.e. realistic evaluation; and the three phases of the study: baseline, development and evaluation phases. The different methods used to collect data, their development process and the approaches followed for quantitative and qualitative data analysis are explained. The chapter concludes with a review of ethical issues.

2.1. Study design

2.1.1. Realistic evaluation

This project has followed a realistic evaluation approach to design, implement and evaluate an intervention aimed at enhancing clinical nursing research. The realistic evaluation methodology is a relatively new approach for nursing research, nevertheless, its main features seem to be appropriate when investigating complex interventions, because it helps to determine the effectiveness of interventions provided to individuals, groups or communities (Sidani et al 2004). By complex interventions we mean, interventions that are subjected to many components which have to be taken into account because of the potential impact that they might have on its outcomes (Blackwood 2006; Byng et al 2005; Rychetnik et al 2002; Stead et al 2002; Campbell et al 2000). To understand the multiple components of these interventions and their relationships, both qualitative and quantitative approaches may be helpful (Oroviogicoechea 2008; Stead et al 2002; Campbell et al 2000).

The methodology realistic evaluation was developed by Pawson and Tilley (1997). It provides a framework for evaluation based on the philosophical position of 'critical realism', which claims that 'the structures creating the world cannot be

directly observed' because there are layers of reality that might be important but are not always tangible (Byng et al 2005). In other words, critical realism states that 'there is a reality out of there that is independent of our observations or thoughts about it' (Porter and Ryan 1996, p.415). It offers quite a different alternative from positivists and relativists, claiming the stratified character of the real world and emphasising the interdependence of structures (social worlds and organizations within which individuals are embedded) and agency (human agents), both involved in all social programs (Kazi 2003; McEvoy and Richards 2003; Pawson and Tilley 1997; Wainwright 1997). One of the main features of this paradigm is its theory of causation, which strongly differs from that of positivism (Forbes and Griffiths 2002). Critical realism states that 'a generative model of causation could be used to explain how things change' (Pawson and Tilley 1997, p.56) and that 'causal outcomes follow from mechanisms acting in contexts' (Kazi 2003; Appleton and King 2002, p.643; Pawson and Tilley 1997, p.58). Therefore, for critical realists it is essential to understand generative mechanisms, which refer to the structures, powers and relations that explain how things work. To do so, they take into account the underlying mechanisms that may not be directly observed but that are real (McEvoy and Richards 2003). In other words, this approach does not exclusively rely on the often 'external observable causes', as successionist theory of causation does, but also 'internal powers' are included in its explanations of causality, advocating that this is the only way to offer a complete understanding of phenomena (Kazi 2003; Pawson and Tilley 1997). 'The potential mechanisms of causation residing in both actors and society are real and present even when not active and when actualized may or may not be observable. Whether or not an outcome occurs is determined by the interplay of positive and countervailing mechanisms' (Byng et al 2005, p.72). Therefore, the main aspect is that of generative mechanisms based on causality being an internal potential of the programme or intervention that is activated in the right conditions.

Far from being just interested in whether a programme works, the realistic evaluation tries to understand *why* and *how* it causes change and acknowledges the significance of the context in the outcome, as generative mechanisms are considered to be contextual dependent (Pawson and Tilley 1997). In other words, 'it tries to get inside the *black box* of a programme and to understand what it is about a program which makes it work (mechanisms), for whom, in what circumstances (contexts)' (Oroviogicoechea 2008; McEvoy and Richards 2003).

An evaluation study should be able to determine how effective the research was to identify the impact of the intervention and the adequacy of the intervention itself. Besides, it is very important to provide an explanation of 'unsuccessful' interventions to understand whether it was the intervention itself that failed or its implementation. Some authors (Byng et al 2005; Stead et al 2002) have referred to this as different levels of evaluation: the formative, used to develop the intervention; the process, to understand how the intervention works; and the outcome evaluation, to evaluate the impact (Rychetnik et al 2002; Stead et al 2002). The realistic evaluation study carried out in this thesis has covered the three levels of evaluation by studying the development of the intervention, evaluating its impact, and providing detailed descriptions about *how and why* it did or did not work (Oroviogicoechea 2008; Byng et al 2005).

Another important aspect to highlight about this methodology is that it provides a framework to develop generalizable results in the form of 'middle range theories' about how the mechanisms of an intervention worked in the specific contexts (Oroviogicoechea 2008; Byng et al 2005; Pawson and Tilley 1997). This contributes to the transferability of the results, providing detailed information about the mechanisms of the intervention, the context in which it was implemented and the interactions between them (Rychetnik et al 2002). The study of contexts, mechanisms and outcomes is essential in evaluation research and realistic evaluation looks at the relationships underlying them (Oroviogicoechea 2008; Kazi 2003; Pawson and Tilley 1997). The realistic explanatory formula, and the way theory is constructed, is with configurations of: Outcome(O)=mechanism(M)+context(C).

2.1.2. Contexts, mechanisms and outcomes of the study

The potential contexts, mechanisms and outcomes of the study were identified to help to understand the relationships between them and offer a comprehensive explanation of the intervention design, implementation and outcomes (Oroviogicoechea 2008; Pawson and Tilley 1997).

The 'contexts (C)' include the contextual conditioning of causal mechanisms which turn or not the causal potential in causal outcome. In this study, the

contexts were the hospital where the strategy was implemented, its different sites with their different features; and other given factors (Table 2.1). The 'outcome (O)' is the result of the intervention. In this study there were two potential outcomes: an increase in the nursing research capacity of the hospital, by building nurses' research capability and creating more opportunities or facilitators for research; and a development in the research activity. However, the last, despite being the ultimate outcome of the study, it was considered a long term outcome that could not be achieved in one year, the time of the intervention. Therefore, the main outcome for this study was related to the research capacity. 'Mechanisms (M)' refer to what it is within the strategy, which makes it work. Thus, in this study, they referred to how the intervention contributed to nurses' research capability building, to decrease the barriers and increase the facilitators (Pawson and Tilley 1997). The following Table 2.1 displays the study contexts, mechanisms and outcomes.

Table 2.1 Contexts, mechanisms and outcomes of the study

CONTEXTS	
<p><u>General contexts</u> Ward' characteristics Organizational characteristics Barriers and facilitators</p>	<p><u>Nurses' personal characteristics</u> Demographics and professional profile Academic-research profile (research capability): - Postgraduate courses - Research training - English proficiency</p>
MECHANISMS	
<p>Intervention how it contributed to nurses' research capability building, to decrease the barriers and increase the facilitators and develop nursing research activity</p>	
OUTCOMES	
<p><u>Increase in nursing research capacity</u> Building research capability (knowledge, interest, attitudes) More facilitators Less barriers</p>	<p><u>Development in nursing research activity</u> Research studies Use of research in practice Use of material resources Assistance to conferences Presentation of communications Presentation of posters Publications</p>

2.2. Setting

The general context for this study was the highly-specialised teaching-hospital, the University Hospital of Navarra (CUN), an urban hospital sited in Northern Spain. The hospital has an Applied Medical Research Centre (CIMA). The School of Nursing of the University of Navarra is making important efforts in developing nursing research. In fact, in 1995, the Nursing School elaborated a strategic plan to build the research capacity in its departments. Since then, an important number of lecturers have been incorporated in the School and have done postgraduate education, MSc and PhD, mainly in the UK. The field work of the dissertations and theses carried out by the lecturers of the School has mainly taken place in this Hospital, with the participation and collaboration of ward managers and clinical nurses.

In 2007, a new area called 'the nursing research development and innovation area' (NRDA) was created in the hospital. The principal objective of the NRDA is to develop clinical nursing research in the hospital. It is led by a nurse with a PhD, the former nursing director of the hospital. The creation of this new area was determinant in the implementation of the intervention regarding the support from the hospital management and the provision of human resources.

The researcher and the nurse at the head of the NRDA worked closely during this project. This situation of close collaboration was essential for the development of this study, especially when designing and implementing the intervention, and to ensure that its implementation would not finish with this study.

The Hospital has 400 beds, eight floors and ten hospital wards with different specialities such as cardiology, paediatrics, surgical care, medical care, traumatology, oncology, neurology, and gynaecology. In this hospital there are other wards that include the following specialities: psychiatry, intensive and intermediate care and coronary intensive care. The baseline phase of the study was conducted in all these wards to obtain a clear understanding of the situation regarding the nursing research capacity in the hospital. For the development phase, when the intervention was implemented, due to the limited human resources, some wards were excluded considering their very specific features (psychiatry, intensive care and paediatrics). Finally, it was decided to implement the intervention only in the ten hospitalization wards to have some homogeneity

in the contexts. Nevertheless, some activities of the intervention were open to any nurse who wished to participate, independently of the ward or unit where they worked.

During the time of the study an important change happened in the context, mainly influenced by an economic crisis in the country that also affected the University Hospital of Navarra. A new human resources policy was introduced in the hospital to try to overcome the situation, and one of the measures adopted led to a very tight adjustment in nursing staff to workload. Therefore, there was less flexibility to accommodate unforeseen increases in workload. Moreover, this caused a rotation in nurses between different hospital wards, something unusual in this context, as the stability of the nursing staff in the same unit was normally very high, creating a sense of unease among nurses. This new situation has been demonstrated, according to participants' views, to have an impact on the outcomes affecting nurses' participation and the continuity of some activities, mainly because during the implementation of the intervention nurses did not have the possibility to leave the shift to attend to some of the activities, such as courses or journal clubs. Also, mentors found more difficulties to organise the sessions and dedicate time to the intervention.

2.3. Phases of the study

This study was divided into three phases: the baseline, development and evaluation phases. Different data collection methods, which included qualitative and quantitative approaches, were used to collect the information required in the baseline and evaluation phases. The use of mixed-method techniques to expand the scope of, and deepen their insights from, the studies is increasing in nursing research (Creswell and Plano Clark 2007; Giddings and Grant 2006; Sandelowski 2002, 2000). The purpose of mixed-methods studies includes triangulation, complementarity or development (Creswell and Plano Clark 2007; Greene et al 2007; Sandelowski 2002, 2000). In this study the main purpose was complementarity, to clarify and obtain a more comprehensive understanding of the results.

In the baseline phase, information about the contexts and the research capability, research activity and barriers and facilitators, was gathered to gain an overall

picture of the nursing research capacity/culture of the organization to design the intervention. The data collection methods involved a survey and focus groups. Part of the baseline data was reassessed in the evaluation phase of the study. Pawson and Tilley stated that 'this approach (the realistic evaluation) always begins with an attempt to come to a sociological understanding of the balance of resources and choices available to all participants involved in the program' (Pawson and Tilley 1997, p. xiii) which is a statement that supports the need for this baseline phase in this study.

In the development phase of the study the intervention was designed, taking into account the knowledge obtained in the previous phase, and implemented in the different sites of the hospital.

The evaluation phase was conducted to determine the impact of the intervention and try to develop an understanding of the mechanisms that made it work, or not, in the different contexts. It consisted of a quasi-experiment. The intervention was implemented in the hospital and there was a control and an intervention group. New instruments were developed to evaluate the intervention outcomes.

The three phases of the study are summarised in Table 2.2 and further explained in the next sections of this chapter.

Table 2.2 Study phases (Diagram adapted from Clifford and Murray 2001)

Year 2005-2006

BASELINE PHASE (sample and methods)	RATIONALE
Survey with clinical nurses (CN)	To map the situation regarding the nursing research culture in the hospital; nurses' research capability, research activity and influential factors.
Focus groups with ward managers (WM) and a questionnaire	To explore their attitudes and opinions regarding nursing research and the influential factors. To discuss about strategies to enhance nursing research in the hospital.

Year 2006-2007

DEVELOPMENT PHASE	HOW?
Intervention design (2006)	According to the baseline information the intervention was designed taking into account the CMO. The literature review also informed the intervention development.
Intervention implementation (2007)	The intervention was implemented in the hospital during one year.

Year 2007-2008

EVALUATION PHASE	WHY?
Evaluation with ward managers	To determine measurable outcomes of the project following a realistic evaluation methodology.
Evaluation with nurses	
Evaluation with mentors	To understand 'why and how' the intervention works.

2.3.1. Baseline phase

a. Sample and sampling

An important issue in any research study is the location of key informants. In a realistic evaluation approach, the researcher should be aware of the fact that each stakeholder has something to teach to the others and something to learn from the others. 'The realistic evaluation involves the researcher learning the ideas of the different stakeholders that constitute the program' (Pawson and Tilley 1997, p.160). In this study the baseline sample consisted of clinical nurses and ward managers, because the opinions of both groups are considered complementary and extremely relevant to understand the nursing research culture in the hospital and the intervention mechanisms.

a.1. Groups that compose the sample

In the baseline phase of the study, clinical nurses (CN) working in the Hospital during the data collection period were the target population from which the sample was taken. Table 2.3 displays the inclusion and exclusion criteria for the sample of CN. The total number that composed the study sample was 211 nurses.

Table 2.3 Clinical nurses sample: inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
<p>Clinical nurses working in hospital wards in the University hospital of Navarra.</p> <p>This includes:</p> <ul style="list-style-type: none"> - Nurses working part-time - Nurses working full-time - Nurses with permanent contracts - Nurses with temporary contracts 	<ul style="list-style-type: none"> - Nurses who were not working during the time of the study: sick leaves, maternity leaves. - Registered nurses doing their specialisation courses (post-graduate courses). - Nurses working in special areas with no direct contact with patients: laboratory or pharmacy. - Nurses working in out-patient services. - Bank nurses or nurses working exclusively on the weekends. - Nurses with short contracts: less than 6 months.

Thus, in the baseline phase of the study, in which we wanted to understand the nursing research culture of the hospital, the sample of clinical nurses was a

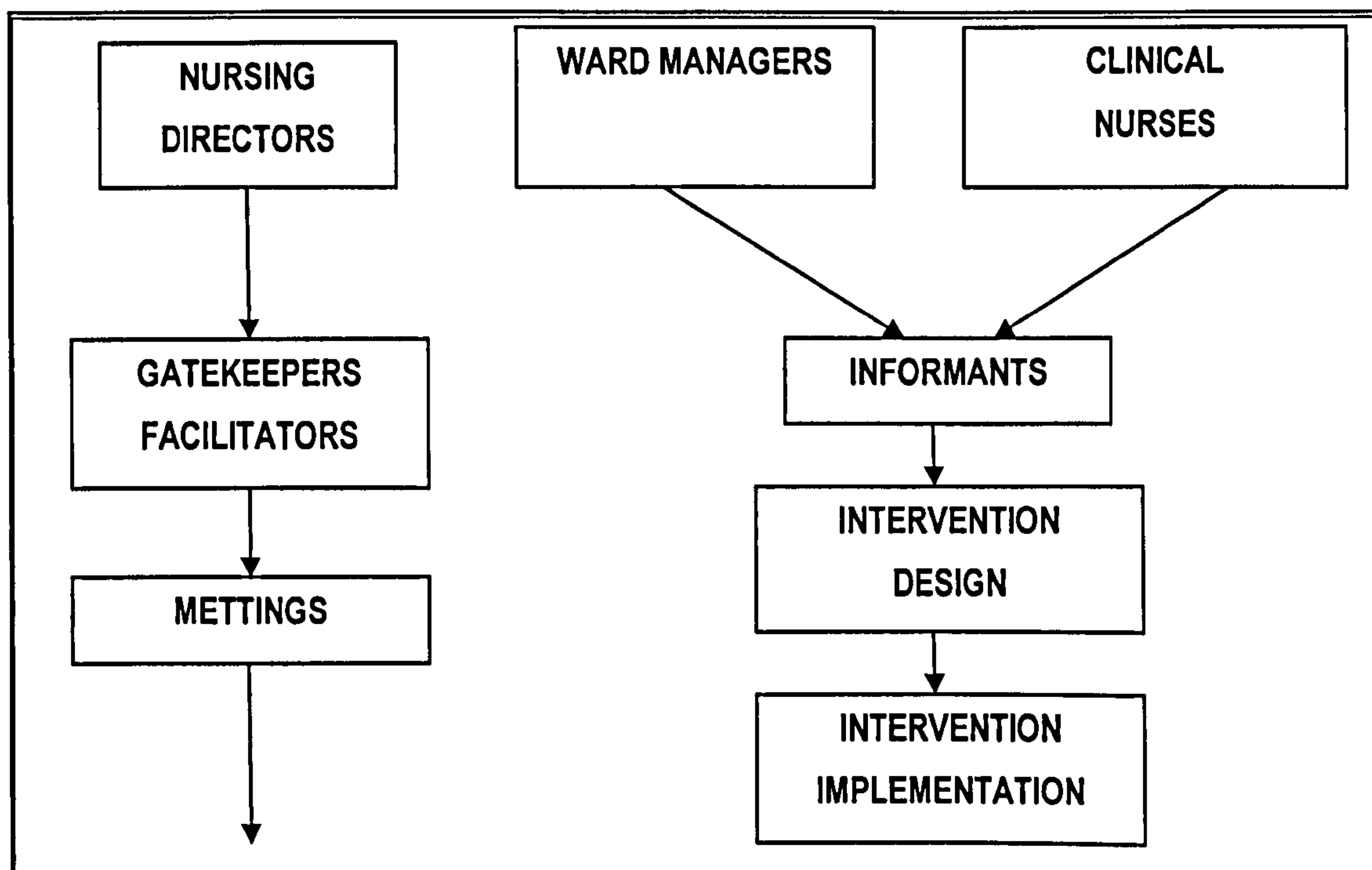
faithful representation of the target population, as it reflected the real situation considering the heterogeneity existing in this group of professionals. Therefore, nurses with very different situations were included: experienced and less experienced nurses; working in different basis, full-time or part-time, and with permanent or temporary contracts. Nurses working in special services or in out-patient services were not included in the baseline sample because their role in these areas differs completely from the hospital wards nurses'.

The main reason for the two last exclusion criteria indicated in Table 2.3 was that if nurses do not have continuity in the ward, it would be difficult for them to achieve an overall view of the existing research culture, barriers and facilitators in the unit. Moreover, to evaluate the impact of an intervention, some continuity in the sample is required.

In addition to CN, ward managers (WM) of hospital wards were part of the sample. They are key agents in fostering or hindering research capacity and activity within clinical nurses. Therefore, in this study, it was crucial to gather their perceptions on the issue. The total number of hospital ward managers were included in the sample (N=13).

Nursing directors were included in the study as gatekeepers but not as informants. They were invited to participate in seminars and meetings organised for ward managers to explain the project or disseminate preliminary results. This was important to keep nursing directors informed about the study and its achievements and to show their crucial role for its continuity. Thus, the work done with nursing directors was part of the strategy to implement the intervention in the hospital. Figure 2.1 illustrates this.

Figure 2.1 Participants in the study: informants and gatekeepers



a.2. Sampling

For the group of clinical nurses the sampling method was different in the baseline and development phases of the study. In the baseline phase, the study population was the total population of nurses meeting the inclusion criteria explained above (Table 2.3). Besides, the entire population of ward managers of hospital areas was included in the study.

b. Obtaining access to the sample

Once ethical approval was obtained from the Ethics Committee of the University Hospital of Navarra, in March 2005, several steps were taken to get the access permission. Firstly, a meeting was held with the general director of the hospital to explain the study. Moreover, the nursing director/manager was given detailed written and oral information regarding the project.

Secondly, to obtain 'informed consent' ward managers received information about the project. They were sent a covering letter explaining the study and asking them to participate in focus groups (Appendix 5). Two or three days later, the researcher visited personally all the ward managers to clarify any aspects and ascertain their decisions. Enough time to decide was given to them before they

gave their consent. Anyone declined to take part. Afterwards, focus groups were organised, always giving them the chance to participate in individual interviews.

Thirdly, another personal covering letter was sent to all clinical nurses who met the inclusion criteria to inform them about the study, and the way of participation and implications (Appendix 6). The opportunity to meet the researcher to clarify any issues was also given to them and anyone made use of it.

c. Baseline instruments design and pilot work

Different instruments for data collection were designed to gather data from CN and WM. A questionnaire was developed to collect the information from clinical nurses, while focus groups were conducted with ward managers. All the instruments were carefully designed and piloted. The following Table 2.4 summarises the different instruments developed in this phase of the study.

Table 2.4 Data collection instruments in the baseline phase

Group of participants	Instruments
Clinical Nurses	Nursing Research Questionnaire (NRQ)
Ward Managers	Questioning route for focus groups Questionnaire (WMQ)

c.1. Nursing research questionnaire development

An extensive literature review was conducted looking at instruments used by other authors (Díaz et al 2004; Clifford and Murray 2001; Kajermo et al 2001; Parahoo et al 2000; Rodgers 2000) and no appropriate questionnaire was found for the purpose of this study. Thus, a new instrument, the nursing research questionnaire (NRQ), was developed taking into account previous research (Appendix 7). A survey with a self completion questionnaire was considered as the best method to gain an overall picture of the exiting situation regarding nursing research in the hospital because of its lower cost compared with other methods and the fact that it allows the study of larger groups collecting data simultaneously (McColl et al 2001). Moreover, it is the easiest way to carry out validity and reliability checks. Several steps were followed in the development of the tool. First, the principal concepts and questions were identified and, second, a pilot work conducted to refine and test the instrument.

c.1.1. Identification of concepts and questions

The nursing research questionnaire (NRQ) was designed to obtain a general picture of the nursing research culture in the hospital. By nursing research culture we refer to nurses' beliefs, values and attitudes regarding research and the research activity conducted in the hospital (Thompson 2003; Greenwood and Gray 1998; Closs and Cheater 1994).

The new instrument was designed to account for the following concepts: research capability; research related activity; and factors influencing research development (Díaz et al 2004; Clifford and Murray 2001; Kajermo et al 2001; Rodgers 2000). Under the concept 'Research capability' the individual characteristics of the nurse that may influence research activity were included. 'Research related activity' included the research production or activity conducted by nurses. Finally, the concept 'Influential factors for research development' included the existing factors, barriers and facilitators that may foster or hinder the development of nursing research activity (Table 2.5).

Table 2.5 Concepts and variables of the NRQ

Concepts	Variables
RESEARCH CAPABILITY:	
Academic profile	Year of qualification, specialisation, educational level, languages
Professional profile	Working experience, working situation
Research knowledge	Research courses, skills, general knowledge
Demographic data	Age, marital status, children, family commitments
Attitudes towards research	Willingness to receive research training and to participate in studies, confidence, awareness, feelings, interest, motivation, perceptions
RESEARCH RELATED ACTIVITY:	
Involvement in research studies	Number, type, role, kind of study, perception
Use of material resources	Databases, library, reading habits
Research utilization and elaboration of clinical guidelines	
Conferences	Attendance and participation with communications or posters
Publication activity	Number and type
Identification of research priority areas	
INFLUENTIAL FACTORS FOR RESEARCH DEVELOPMENT:	
Facilitators	Facilitators and barriers to conduct research studies and to read research
Barriers	Aspects that should be changed for nursing research development

Following discussion with two experts experienced in nursing research and in questionnaires development, a first draft of the questionnaire was developed,

taking into account the relevant literature (Polit and Beck 2008; Burns 2004; Bowling 2002; Jackson and Furnham 2000; Polit and Hungler 1999). The NRQ was composed of 42 questions divided into three sections: research capability; research related activity; and factors influencing research development. It was mainly composed of closed questions, although both open and closed-ended questions were included. Closed questions included different types of responses, some gave two options: 'yes/no', others gave between 3-5 options: 'from none to high', 'from very good to very bad'; and others were Likert scales. In total, out of the 42 questions that composed the NRQ, there were four different scales which contained additional items: the 'research knowledge' scale (nine items); the 'attitudes towards research' scale (19 items); the 'use of material resources' scale (three items); and the 'use of research in practice' (two items).

Some of the closed questions had an associated open question asking for an explanation of the answer given. In addition, there was a section of the questionnaire, on the influential factors for research development, where open-ended questions were used to ask nurses their perceptions about the facilitators and barriers to conducting different research activities in their clinical areas. Open-ended questions were included in this section of the questionnaire in order not to lead their answers and to have a real picture of their perceptions (Polit and Beck 2008; Gerrish and Lacey 2006; De Vaus 2005; McColl et al 2001; Polit and Hungler 1999). The combination of open and closed questions allowed objective information about nurses' attitudes, knowledge and research activity to be obtained and, at the same time, to gather detailed more subjective information about their opinions and perceptions, which helped to provide more in-depth and comprehensive explanations of the results (Jackson and Furnham 2000). The questionnaire was designed in Spanish.

c.1.2. Pilot work: refinement and testing of the questionnaire

Following expert feedback the tool was prepared for the pilot work, conducted in May 2005. The tool involved both qualitative and quantitative approaches (McColl et al 2001). The potential sample for the main survey was the entire population of hospital ward nurses in the University Hospital of Navarra. Therefore, in order not to reduce the final sample size and not to contaminate future respondents, nurses from other hospitals were contacted using 'snowball sampling' (Polit and Beck 2008; Gerrish and Lacey 2006; De Vaus 2005). Three nurses known by the researcher were contacted and informed about the pilot study and 25 nurses

working in other regional hospitals met the main inclusion criteria and participated in the pilot study with a response rate of 80%.

The refinement of the tool involved the study of the content validity and face validity (Polit and Beck 2008; Kansten et al 2007; Bowling 2002; McColl et al 2001; Jackson and Furnham 2000). To study the content validity, which indicates whether its items cover the construct under study (Polit and Beck 2008; Gerrish and Lacey 2006; McColl et al 2001; Jackson and Furnham 2000), several steps were followed during its design. First, it was developed after carefully looking at the relevant literature and, second, the questionnaire was reviewed by experts on both fields, the topic and questionnaire design. In addition, to study the face validity, a qualitative approach was followed (Polit and Beck 2008; Burns 2004; McColl et al 2001; Jackson and Furnham 2000). Participants were given a blank feedback sheet asking them to write any additional comments about the instrument and recommendations to improve it.

The response rate and the ability of participants to respond appropriately and comprehensively to the questions supported the instrument face validity and content validity. The literature review carried out before developing the first draft of the tool and the review of the instrument made by two experts in nursing research and questionnaires development enhanced the NRQ content validity. The experts' contribution mainly helped to assure that the construct under study was adequately covered. In addition, participants' comments about the instrument suggested adequate face validity (Appendix 8). The refinement of the first draft of the tool was done by taking into account the few recommendations given to clarify and simplify it, which mainly referred to the wording of some questions, the appearance of the scales and the need for clarification of some of the questions. No question needed to be deleted or added to the final tool.

To test the questionnaire, the reliability of the tool was studied (Kansten et al 2007). To do so, both internal and external reliability should be taken into account. In this study, the reliability of the four scales contained in the NRQ: 'research knowledge', 'attitudes' towards research', 'use of material resources' and 'use of research in practice' scales, was studied. To test the internal reliability of the instrument, or in other words, the internal consistency of items within a scale, Cronbach's alpha tests were performed with each of the four scales and values over 0.70 were considered acceptable (Polit and Beck 2008; Kansten et al

2007). To study the external reliability, which indicates the consistency of measure over time, test retest was conducted for each of the four scales of the NRQ (Polit and Beck 2008; Yen and Lo 2002; McColl et al 2001; Jackson and Furnham 2000; Redfern and Norman 1995). To do so, a score was obtained from each scale by summing the responses to their items. Therefore, participants completed the questionnaire twice in 7-10 days. This period was estimated to be appropriate to avoid memory recalls and, at the same time, the possibility of changes in the sample (Polit and Beck 2008; Yen and Lo 2002).

Internal and external reliability are summarised in Table 2.6. T1 represents the first time the questionnaire was answered and T2 the second time (7-10 days after). As the questionnaire was completed twice, Cronbach's alpha coefficients of the four scales were calculated at both times: T1 (first time) and T2 (second time).

Table 2.6 Reliability tests' results

Scale	Cronbach's alphas T1/ T2	Test re-test result t-student, p	Intraclass correlation coefficients
Research knowledge	0.90 / 0.93	t=0.240, p=0.81	0.93
Attitudes towards research	-0.25 / -0.38	t=-3.81, p=0.001	0.66
Use of material resources	0.63 / 0.44	t=-0.27, p=0.79	0.93
Use of research in practice	0.58 / 0.75	t=-0.251, p=0.80	0.81

The best results were for the 'research knowledge' that nurses have on different areas (Table 2.6). The lowest alpha was for the 'attitudes towards research' scale. This was not surprising because it was measuring several aspects. Therefore, items were regrouped following common sense and once the data for the main survey was obtained, a factor analysis was done. In all the scales, except in 'use of material resources', results improved at T2.

To calculate the stability of the tool, T1 and T2 values were compared using t-tests and intraclass correlation coefficients. Results are summarised in Table 2.6. In all the cases, except 'attitudes towards research', p values for t were not significant and the correlation coefficients were over 0.70; therefore, a high

degree of external reliability or stability of the instrument is demonstrated (Polit and Beck 2008; Cormack 2000).

No substantial changes were made to the questionnaire following the pilot work. Only a few questions wording and format were modified and the items of the attitudes towards research scale were regrouped. Following the main survey, further statistical tests, such as the factor analysis of the 'attitudes towards research' scale were conducted to identify the underlying factor structure of the scale and to improve its properties.

c.2. Development of instruments for ward managers

Focus groups were considered the best method to gather information from ward managers because it allows collecting data regarding participants' opinions and attitudes towards a topic, through group interaction (Prieto and March 2002; Morgan and Krueger 1998; Morgan 1997). The first principle of a focus group is to ask questions in a conversational manner to create and maintain an informal environment (Krueger and Casey 2000; Twinn 1998). For this study, a questioning route has been created (Appendix 9) (Prieto and March 2002; Morgan and Krueger 1998). This approach helps the moderator to assure that all the main issues are covered, minimises differences in questions that could potentially introduce bias and enhances consistency (Krueger and Casey 2000; Morgan and Krueger 1998; Morgan 1997).

The sections included in the questioning route were: 'Nursing research: understanding, perceptions and attitudes'; 'Ward managers' role and personal involvement'; and 'Barriers to and facilitators for research development'. These were decided after a review of the relevant literature and carefully considering the objectives of the focus groups (Appendix 10).

The questions were open-ended. Issues such as the wording of the questions and the order, going from general and easy questions to more specific, were considered (White and Taylor 2002; Webb and Kevern 2001; Krueger and Casey 2000; Morgan and Krueger 1998; Sim 1998). At the end of the questioning route a question for any additional comments regarding nursing research was included to elicit any issues that could have arisen during the discussions and WM might wish to highlight or clarify.

The questioning route for focus groups was piloted. To study its validity, it was reviewed by experts on the topic and on the method. Moreover, as the researcher did not have previous experience with this method a 'simulated' session was run to check and improve, not only the questions, but also the moderator's skills. In order not to lose people from the sample of ward managers, the 'pilot focus group' was conducted with three colleagues from the Nursing School, experts in this method of data collection. The session lasted for one hour and was tape-recorded to allow the researcher to listen to it afterwards with the objective to improve skills asking questions, moderating the session and motivating discussion in the group. Moreover, the researcher took notes about non-verbal language to enhance the richness and depth of the data. Regarding the questioning route, only the order of some questions was changed. The main output of this pilot focus group was that it helped the moderator to be more prepared before going to the real data collection as the researcher became aware of many of the challenges of this method.

A short questionnaire was also designed to collect information regarding ward managers' individual characteristics. This information was considered to be important to have a more comprehensive picture of their situation. The questionnaire (WMQ) was similar but a shorter version of the NRQ. It consisted of 23 questions divided into three sections: demographic data; academic and professional profiles, and nursing research skills, knowledge and experience (Appendix 11).

d. Baseline data collection

This phase took place between May and November of 2005. In this section a description of how data collection process took place during this phase will be given. Table 2.7 illustrates the baseline data collection, first part of Table 2.2 showing the three study phases.

Table 2.7 Baseline phase data collection

BASELINE PHASE (sample and methods)	RATIONALE
Survey with clinical nurses (CN)	To map the situation regarding the nursing research culture in the hospital; nurses' research capability, research activity and influencing factors.
Focus groups with ward managers (WM) and a questionnaire	To explore their attitudes and opinions regarding nursing research and the influencing factors. To discuss about strategies to enhance nursing research in the hospital.

d.1. Baseline data collection from clinical nurses: the survey

A survey was conducted with nurses via a self-completion questionnaire to gain an overall picture of the existing situation regarding nursing research in the hospital. The main advantages of this technique are: its lower cost compared with other methods and that it allows the study of larger groups collecting data simultaneously (McColl et al 2001). Thus, it has been considered a suitable method for this research. Nevertheless, the use of self-completion questionnaires is not free of potential disadvantages, mainly related to the response rate, the construction of the tool and its administration bias (De Vaus 2005; McColl et al 2001; Polit and Hungler 1999). All these challenges were carefully considered when designing and piloting the instrument and were also taken into account during the whole data collection process. Issues of rigour, validity and reliability were all taken into account.

The strategy to conduct the survey was to arrange rooms where nurses came to complete the instrument, over several days and covering a wide range of working hours, taking into account the best moments for the workflow of the wards. This was used to obtain a good response rate (questionnaires were completed at working time), to avoid data contamination, to ensure that questionnaires were answered in the same circumstances by the appropriate person and that the same explanation about the questionnaire was given to all participants (McColl et al 2001; Fink and Kosecoff 1998). A total of 12 days in September-October 2005 were used for data collection.

All staff nurses working in the hospital wards, who met the inclusion criteria, were invited to participate (N=211). They were sent a covering letter reminding them about the dates and hours in which they could participate (Appendix 6). 'Eye-catching' posters informing about the dates arranged to complete the

questionnaire were placed in nurses' rooms on the wards' notice boards (Appendix 12). Besides, the researcher met personally with ward managers to inform them about the dates for data collection and to reinforce their role during the process. During the data collection process, the response rates of each ward were checked daily and ward managers were reminded by phone or email asking them for collaboration facilitating nurses' attendance.

The researcher or the assistant stayed with nurses while they were completing the questionnaire. Before completion, nurses were given a brief explanation about the survey objectives and how to complete the questionnaire. They were informed about the need to track participants personally to evaluate the impact of the intervention. After assuring the confidentiality of the data, no nurse refused to give their names to facilitate the tracking. Nurses' names were associated to codes, information that appeared in the questionnaire for the follow up. The relation of names and codes has been kept in separate sheets by the researcher, assuring the confidentiality of data. The completion of the questionnaire was taken as the consent to participate in the study.

Another strategy was used with those nurses working on different basis, night shifts and part-time, or who could not leave the ward during the data collection days due to a variety circumstances. In these cases, questionnaires were left in the ward pigeonholes and collected after a few days. This measure enabled nurses with different situations to take part in the study obtaining a faithful representation of the study population. Data collection finished at the end of October and the final response rate was 76.7% (N=162).

d.2. Baseline data collection from ward managers

The aim of the baseline data collection from ward managers was to obtain information about their understanding and attitudes towards nursing research, and the influential factors they perceived for its development.

Focus groups were used for data collection because they are one of the most widely used techniques to collect qualitative data through group interaction (Amezcuca 2003ab; White and Taylor 2002; Webb and Kevern 2001; Sim 1998; Kitzinger 1995). A major advantage of a group format is that it allows to obtain the viewpoints of many individuals in a short time (Polit and Beck 2008; Polit and Hungler 1999; Kitzinger 1995) gaining a picture of the most dominant set of ideas

or values within a group (Amezcuca 2003ab; White and Taylor 2002; Webb and Kevern 2001; Sim 1998). Moreover, focus groups provide evidence about the similarities and differences of participants' opinions and experiences.

The key of focus groups is to assure adequate groups' dynamics, creating a comfortable and productive conversation. Participants should feel comfortable talking to each other and generating discussions that contain useful information (White and Taylor 2002; Webb and Kevern 2001; Morgan and Krueger 1998; Sim 1998). Thus, the composition of groups is crucial. In this study, when organising the groups, the determinant aspects highlighted in the literature were taken into account (Polit and Beck 2008; Pope and Mays 2006; McLafferty 2004; Amezcuca 2003a; Pope et al 2002; Krueger and Casey 2000; Pope et al 2000; Morgan and Krueger 1998). These include the following:

- 'The size of the group'. There is no consensus regarding the most appropriate groups' size, varying between 3-12. In this study the total sample size was 13 WM and it was estimated that groups of 4-5 participants would be appropriate. The reasons were that small groups facilitate discussion and participation, and the possibility of organising three sessions helps to get saturation and compare groups.
- 'The homogeneity of the group (compatibility)', important to assure participants' interaction. The components of a group should share common characteristics that help them to talk freely, avoiding hierarchy within the group or the presence of a person who could inhibit others.
- 'The heterogeneity between and within groups'. Within groups to assure rich discussion due to different opinions and experiences and between groups to allow comparison.
- 'Strangers or acquaintances'. Participants in this study are quite familiar with each other, which implies higher risk of breaking the discussion into separated discussions or of a tendency to agree with the others. It is also important to recognise that the moderator is familiar to some of the participants and that this may have an impact on the process.

Before deciding the composition of the groups in this study, ward managers were asked to participate. They were sent a covering letter (Appendix 5) and after two or three days, the researcher met them personally to explain the study and clarify any questions. The entire population of hospital ward managers agreed to participate in the study and signed an informed consent form (Appendix 13).

The groups were carefully organised taking the issues mentioned above into account. Therefore, the characteristics of participants that could have an influence on their views about nursing research were considered. Table 2.8 displays the characteristics taken into account for groups' composition. The principal criteria to organise them have been the research knowledge, experience and motivation. Finally, there were three groups labelled FG1, FG2 and FG3.

Table 2.8 Criteria for ward managers groups' composition

ID	Ward	Age	Years as WM	Research experience & knowledge	Motivation	FG
WM1	3 ^a	40	> 10	None	Medium	1
WM2	4 ^a II	50-60	> 20	None	None	1
WM3	5 ^a V	40-50	> 10	Medium	Medium-low	1
WM4	8 ^a	50-60	> 20	Low	Low	1
WM5	6 V	35-40	5-10	Low-medium	High	2
WM6	7 ^a V	40	>10	Medium	High	2
WM7	5 ^a II	40	2	Medium	Medium	2
WM8	2II	40	2	None	Low	2
WM9	ICUA	50-60	> 10	High	High	3
WM10	ICUA	40-50	5-10	High (MSc)	High	3
WM11	4 ^a V/2 ^a V	40	>10	Medium	Medium	3
WM12	ICUN	40	10	Medium	Medium	3
WM13 ¹	2 ^a partos	40	10	Medium	High	NONE

¹ Ward manager who could not participate due to an unexpected family event.

Ward managers were reminded by telephone the day before the focus groups and 92.3% attended. One of them could not participate due to an unexpected family event; nevertheless, she completed the questionnaire. The dates and hours of the sessions were arranged according to their preferences. The total number of participants was 12 and three focus groups were conducted with four participants in each group. The duration of the sessions varied from 55 minutes to 1hour and 20 minutes. Before starting the session, permission to tape-record discussions was sought from participants. The sessions were run in a room in the hospital, the place where they usually hold their meetings (Appendix 14), being a familiar and friendly environment for participants. Refreshments were offered to participants during the session.

As recommended in the literature, the sessions were conducted by a moderator, the researcher, and an assistant (Prieto and March 2002; Morgan and Krueger 1998). The moderator asked the questions, guided the discussion and stimulated interaction encouraging participants to share their opinions in a non-threatening environment. The moderator tried to ask the questions in a consistent way and in

the same order to allow comparison. Also, as the literature recommends, the moderator introduced the group discussion in a consistent manner. The pattern followed included:

- Welcome and introduction of the moderator and the assistant.
- An overview of the topic.
- Explanation of the guidelines or ground rules to make the discussion go better.
- Opening questions.

The assistant was responsible for receiving people who came late, arranging refreshments and technical issues, such as the tape-recorder. The start of one of the sessions had to be delayed because two WM arrived late and, in another FG, one WM was incorporated with the discussion already started. However, she was integrated into the group without any difficulties. During the focus groups, the role of the assistant was to observe non-verbal data, from the back of the room, and take notes of the discussion. She participated at the end of the sessions asking additional questions, clarifying aspects and doing a brief summary of the key issues arisen in the discussion to enhance validity. After the focus groups, the assistant and the moderator did a debriefing of the discussion which consisted of checking together issues such as: the most important aspects discussed; how this differed from what was expected or early groups; and points that should be considered to enhance the richness and validity of data. The sessions and the debriefing were tape-recorded and fully transcribed by the researcher.

Respondents were given the opportunity to participate in individual interviews if they wished to explore further any issue that arose during the group discussion or if they felt intimidated to talk in front of their colleagues (White and Taylor 2002; Webb and Kevern 2001; Polit and Hungler 1999; Sim 1998). None of them asked the researcher to do an individual interview.

In addition to the focus groups, a questionnaire, the WMQ, was used to collect individual characteristics of WM (Appendix 11). It was completed by ward managers in the same room after finishing the focus groups.

2.3.2. Development phase

This phase of the study took place from April 2006 to December 2007. In the development phase, the intervention, informed by the baseline information, was designed and implemented in the hospital. The following Table 2.9 illustrates the development phase of the study (second part of Table 2.2).

Table 2.9 Development phase

DEVELOPMENT PHASE	HOW?
Intervention design (2006)	According to the baseline information the intervention was designed taking into account the CMO. The literature review also informed the intervention development.
Intervention implementation (2007)	The intervention was implemented in the hospital during one year.

a. Intervention design

The baseline data obtained in the previous phase of the study informed the design of the intervention. Results of the baseline phase of the study are explained in detail in the Chapter 3 of the thesis. Nevertheless, in this section, the principal results from the survey and focus groups, that illustrated the intervention design, are briefly displayed to facilitate readers' understanding of the process.

a.1. Summary of principal results from the baseline phase

a.1.1. Results from the survey with clinical nurses

The main results of the survey used for the design of the intervention are summarised in the following Tables 2.10 and 2.11.

Table 2.10 Main results in the survey with clinical nurses

Variable	Descriptive results	Statistically significant relationships RC and RRA
DEMOGRAPHICS	Gender: 100% female; Age: 32.4 (SD 7.47); Married: 51%; Children 46%	
RESEARCH CAPABILITY (RC)	<p>Years of experience: 11 (SD: 7.3)</p> <p>Contracts: 64% permanent (68% full-time) 36% temporary (58% full-time)</p> <p>Postgraduate courses: 53% (Master: 3%)</p> <p>English proficiency: 60% none-low</p> <p>Research knowledge: Research course: 13% Research knowledge: 92% none-low</p> <p>Interest: 86% in preparation/75% in participation</p> <p>Attitudes positive: 94% value when peers do research; 72% would do it if they had time; 93% think research is important and 89% interesting.</p>	<p>Research knowledge and: Research training Interest Attitudes Participation in research projects Use of material resources Use of research in practice</p> <p>Interest and: Research knowledge Research training Attitudes English Use of material resources Use of research in practice Attendance to conferences Publications</p> <p>Attitudes and: Research knowledge Research training English Use of material resources Use research in practice Attendance to conferences Publication</p>
RESEARCH RELATED ACTIVITY (RRA)	<p>Research projects: 59% (92% collecting data; 17% director of the project)</p> <p>Use of material resources: 83% and 78% 'never or once/twice a year', use databases and the library, respectively</p> <p>Attendance to conferences: 45% seldom, 21% once every 2-3 years</p> <p>Presentation of communications: 52%</p> <p>Publication: 30%</p>	
BARRIERS AND FACILITATORS	<p>To do research studies:</p> <p>-Facilitators: ward managers' support (26%); access to information (19%); material resources (16%); attitudes (7%)</p> <p>-Barriers: time (47%); knowledge (15%); attitudes (10%); work organization (10%)</p> <p>To read research:</p> <p>-Facilitators: material resources (45%); access to information (35%); personal habit (5%)</p> <p>-Barriers: time (47%); knowledge (18%); language (14%); attitudes (11%)</p>	

Table 2.11 Nurses' recommendations to develop nursing research

Principal aspects to address to develop nursing research

Time during the shift; integrate it in nurses' daily work (n=46)

More research knowledge and preparation (n=38)

Peers' support (n=31)

More staff (to do research without overloading peers) (n=13)

Ward managers' support (n=10)

Economical support (n=7)

Research experts' support and follow up (n=5)

Research priority areas relevant to nurses (n=3)

The survey results showed that nurses are interested and hold positive attitude towards research but they lack research knowledge and perceive important barriers, thus, the percentages of nurses involved in research activities are low. Nurses' research knowledge, interest and attitudes towards research were aspects of the research capability related to most of the research activities. Looking at their perceptions about the barriers and facilitators to do research and recommendations to overcome them, it was noticed that the lack of knowledge was the second most important barrier, and that their interest and attitudes were also considered determinant factors. Therefore, it seems that, to increase nursing research activity, one of the aspects in which the intervention should be focused on is nurses' research capability: the research knowledge, attitudes, interest and awareness.

Another aspect that, according to nurses' views, was determinant to research development was the support they receive from ward managers. So, interventions should be also directed to enhance ward managers' support by:

- Increasing WM awareness of nursing research relevance.
- Helping them to play their role regarding nursing research development.
- Studying how to make the best of the available resources: time, human and material resources.

Besides, research experts' support was identified by CN as very important for their involvement in research activities and nursing research development. This was considered in the intervention design.

a.1.2. Results from focus groups with ward managers

The baseline data obtained from ward managers was also taken into account in the intervention design. The principal findings that orientated the design of the intervention appear summarised in the following paragraphs and in Table 2.12.

Ward managers consider that all nurses, independently of their position (staff nurses, ward managers, nursing directors), have part of the responsibility in nursing research development. The managers of the hospital have the responsibility to facilitate and provide the needed resources for research, including economical, material and human resources. Ward managers consider that their responsibility is to facilitate, motivate, and support nurses to do research. However, they do not feel prepared and supported to do so.

Most of the ward managers perceive that research results do not have a real impact on practice, which make it more difficult for nurses to become aware of the importance of participating in research activities. They find that there is no a research culture among nurses because for them to work is to be with the patient.

The main barriers and facilitators identified by WM appear summarised in Table 2.12.

Table 2.12 Barriers to and facilitators for nursing research

Barriers	Facilitators
<p>Lack of support: from CUN direction, doctors, nursing school, experts in research and peers.</p> <p>Lack of time: difficulties regarding work organization/ staff shortage.</p> <p>Lack of knowledge</p> <p>Lack of economic resources</p> <p>Lack of motivation</p> <p>No research impact on practice</p>	<p>Training: to have research prepared nurses in the ward.</p> <p>Expert support: from academics/school, and people in the clinic</p> <p>Doctors' help</p> <p>Support from hospital managers</p> <p>Definition of research priority areas</p> <p>Resources</p> <p>Dissemination of results and impact on practice</p>

As it can be seen in Table 2.12, the barriers and facilitators identified by ward manager in the focus groups are congruent with clinical nurses' views.

b. The intervention

First, a group of people with experience and knowledge on nursing research met to reflect on what to expect from ward managers and clinical nurses regarding nursing research in our context, considering the real situation. The discussion lead to the following conclusions summarised in Table 2.13.

Table 2.13 The role of WM and CN regarding nursing research

Ward managers (WM) and research	Clinical nurses (CN) and research
<p>They have a leadership role. They should have knowledge:</p> <ul style="list-style-type: none"> - To discuss nursing research interest and relevance - To make the most from the resources to facilitate/support nurses to participate in research activities - To work on the barriers and facilitators to facilitate research activity being conducted in their wards - To identify researchable questions and priorities from their practice - To design a strategy for the development of nursing research in their wards (short term and long term activities) - To design a plan to put the strategy in place 	<p>They should consume scientific knowledge (more than produce new knowledge) They should have knowledge:</p> <ul style="list-style-type: none"> - To discuss about nursing research interest and relevance - To read and critique research articles - To evaluate information in articles and consider changing practice - To know the steps of the research process - To identify research problems or questions from their practice - To be able to collaborate in nursing research projects conducted in their wards and in other research activities

The aim of the intervention was to develop the nursing research culture of the hospital by enhancing nursing research capability, capacity and, ultimately, research activity. The intervention was mainly focused on building nurses' research capability because the findings of the baseline phase showed that the research capability was related to nurses' research activity. Moreover, the intervention tried to increase the nursing research capacity in the hospital, a more general concept that includes contextual issues, barriers and facilitators. The intervention was focused on ward managers and clinical nurses because they are the key agents in nursing research development.

b.1. Intervention with ward managers

Based on what is expected from ward managers (WM) regarding research development (Table 2.13) and the baseline results, the intervention with WM had two strands: a seminar (WMS) and the provision of support for the design of a strategy for nursing research development in their wards.

The WMS, entitled 'A nursing research culture' (See program in Appendix 15) lasted for two days and had the following objectives.

To enable WM to:

- Discuss the relevance of research for nursing and their leadership role in its development in their units.
- Identify research priority areas in their units from practical issues.
- Work in groups about strategies to decrease the barriers and increase the facilitators with the aim of developing nursing research in hospital wards.

To achieve these objectives, the seminar was divided in three parts:

- The identification of the most influential factors for the development of a nursing research culture.
- The classification of factors regarding their impact and complexity.
- The planning of concrete actions to act on the identified factors.

In Chapter 3, detailed information about the work done in the WMS is provided.

The other strand of the intervention with ward managers consisted of providing the support of a research expert (mentor) during the period of the intervention implementation to design a local strategy for their units with the objective of developing nursing research capacity or activity.

b.2. Intervention with clinical nurses

Taking into account the survey results and what was expected from clinical nurses regarding research (to be consumers more than knowledge producers), the intervention for CN consisted of short research courses and journal clubs.

b.2.1. Research courses (see program in Appendix 16)

The research courses (RCO) were organised in the form of a two days seminar with the following objectives. To enable nurses to:

- Discuss the relevance of research for nursing and their role in its development.
- Use databases to find articles.
- Appraise a research paper relevant to their practice.
- Understand the relevance of translating the research evidence into clinical practice.

b.2.2. Journal clubs

The journal clubs (JC) were sessions of critical appraisal of research papers. They were open to CN and WM and organised and delivered by mentors.

The JC objectives were:

- To learn how to read critically a paper, using different methodologies.
- To put in practice the theoretical knowledge about research methods given in the research course.
- To discuss research evidence and evidence based practice.
- To help nurses to identify research priority areas in their units from practical issues.
- To identify if there is evidence to change practice.
- To increase the research impact on practice.

b.3. Mentors' network

A mentoring network (MN) was established in the hospital with two different objectives: to implement the intervention activities in the hospital; and to overcome one of the principal barriers for research development identified in the literature review and in the baseline phase of the study, the lack of experts' support.

The mentors' network was made up of nurses, with MSc or PhD, working in the hospital with research knowledge and experience. Their role as mentors included:

- To prepare and deliver the research courses for clinical nurses.
- To organise and run the journal clubs.
- To work with ward managers in the design and implementation of small strategies to develop nursing research activity in the different hospital wards.

Mentors received training and support to help to develop their role. Before commencing the intervention activities, they participated in a six hours seminar with the following content:

- Mentoring in general: what is it about?
- Their role in the implementation of the intervention.
- How to conduct journal clubs.
- How to design a strategy to develop nursing research in hospital wards.

In addition to the seminar, during the whole period of the intervention implementation, mentors received continuing support and advice from the researcher and the NRDA.

All the intervention activities described above are summarised in Table 2.14.

Table 2.14 Intervention activities with WM, CN and MN

Intervention group	Activity	Mentors
Ward managers of hospital wards	WMS 'A nursing research culture' JC	Functions: -Work with ward manager in the design of a strategy for research development -Deliver the nurses' research course -Run JC
Clinical nurses of the whole hospital	RCO JC	

c. Intervention implementation

The intervention implementation lasted one year, from January 2007 until December 2007. The Directive panel of the hospital was informed about the intervention by the researcher, responsible for the intervention design and implementation. They gave their consent and support to the project.

Most of the intervention activities were implemented in the whole hospital with the support of the NRDA and the hospital management. The research courses (RCO), seminars (WMS) and JC were open to nurses and ward managers working in any services of the hospital, including hospital wards, out-patient services and special services. Nevertheless, the part of the intervention consisted of the close collaboration of ward managers and mentors for the design and implementation of specific strategies for research development, was limited to some of the hospital wards. The reason for this was the lack of human resources, as the number of nurses in the hospital prepared to be mentors was limited to six. Therefore, nine hospital wards were included and organised by five common specialities: oncology, cardiology, internal medicine, neurology and general surgery, with a mentor or two for each. Hospital wards with very specific characteristics such as psychiatric, intensive care and paediatrics were excluded in this part of the intervention for reasons explained earlier.

The intervention started with the organization of the mentors' network. The researcher and the NRDA worked together to identify nurses in the hospital with the profile to be a mentor. These nurses were informed about the study and the

intervention and all agreed to participate. A 'research day' per week for mentors, during the time of the intervention implementation, was agreed with the nursing director of the hospital. Therefore, mentors had the possibility to spend this day in the library preparing the different activities of the intervention. In the cases in which mentors were staff nurses of hospital wards, their WM were informed about the situation and asked for their collaboration by facilitating mentors' work. All of them agreed.

The first intervention activity that took place in the hospital was the training seminar for mentors. It was delivered by a Professor of Nursing from the UK with experience in nursing research and familiar to mentors and to the hospital where the intervention was being implemented. Thus, he had a clear and realistic view of the context. After this seminar, all the mentors worked together with the person responsible for this intervention to clarify the intervention objectives and their role in nursing research development.

Secondly, the intervention with ward managers was implemented. The first step was to organise an introductory meeting explaining the intervention and its objectives. Afterwards, the WMS 'A nursing research culture' was run. All the ward managers of hospital wards, who were informed about the seminar dates by email, attended the seminar. Written material was prepared with the principal outcomes of the seminar, influential factors and specific strategies to overcome them, to help them in the work with mentors for nursing research development in hospital wards.

Thirdly, the RCO for nurses was organised and delivered by mentors and the researcher. At the beginning, the plan was to have a course for a group of 25 clinical nurses. Nevertheless, due to the high interest found among nurses, the course had to be repeated three times to satisfy the real demand. Moreover, although the course was originally organised for clinical nurses, it was necessary to prepare a fourth edition for WM, who demanded a research course for them. A handbook with the course contents, bibliography and relevant articles was prepared and given to the participants of the course.

Once these activities for mentors, WM and CN finished the JC were implemented in the hospital. These were organised by mentors. One of them was the coordinator for the diffusion of JC sessions in the hospital. Each mentor selected

an article for critique, decided the date for the JC and informed the coordinator. The diffusion was done by email to WM and CN who participated in the research courses. Moreover, the information about the JC, with the article for critique, was placed in nurses' rooms on the notice boards to facilitate diffusion to all the nurses. Nurses were asked to read the paper before attending the JC. The articles were chosen based on their relevance for nursing clinical practice. This was considered essential for two reasons: to stimulate nurses' participation and interest in reading the paper; and to help them to understand the potential relevance that research could have in improving clinical practice. In the JC, in addition to doing a critical appraisal of the paper, discussion about how research results could apply in practice was stimulated. The sessions were organised taking into account the best days and time for the workflow of the wards. Ward managers enabled nurses to attend during their shifts, when the workload allowed them to do so. During the summer, it was not possible to organise JC due to the holidays.

The intervention implementation and the schedule followed are summarised in Table 2.15.

Table 2.15 Intervention schedule

Month	Activities			
January 2007	-Information to Hospital Directors -Organization of mentors' network (MN) -Mentors training seminar			
February 2007	-Introductory meeting with ward managers			
March 2007	-WMS 'A nursing research culture' -Three RCO with CN -WM and mentors were given material to help them in the design of the strategies for research development.	Meetings with mentors, NRDA and the researcher	Meetings with WM, the Nursing managers, NRDA and the researcher	Ward managers and mentors work together in the strategy design
April to June 2007	-One RCO with WM -Six JC			
July to September 2007				
October to December 2007	-Five JC			

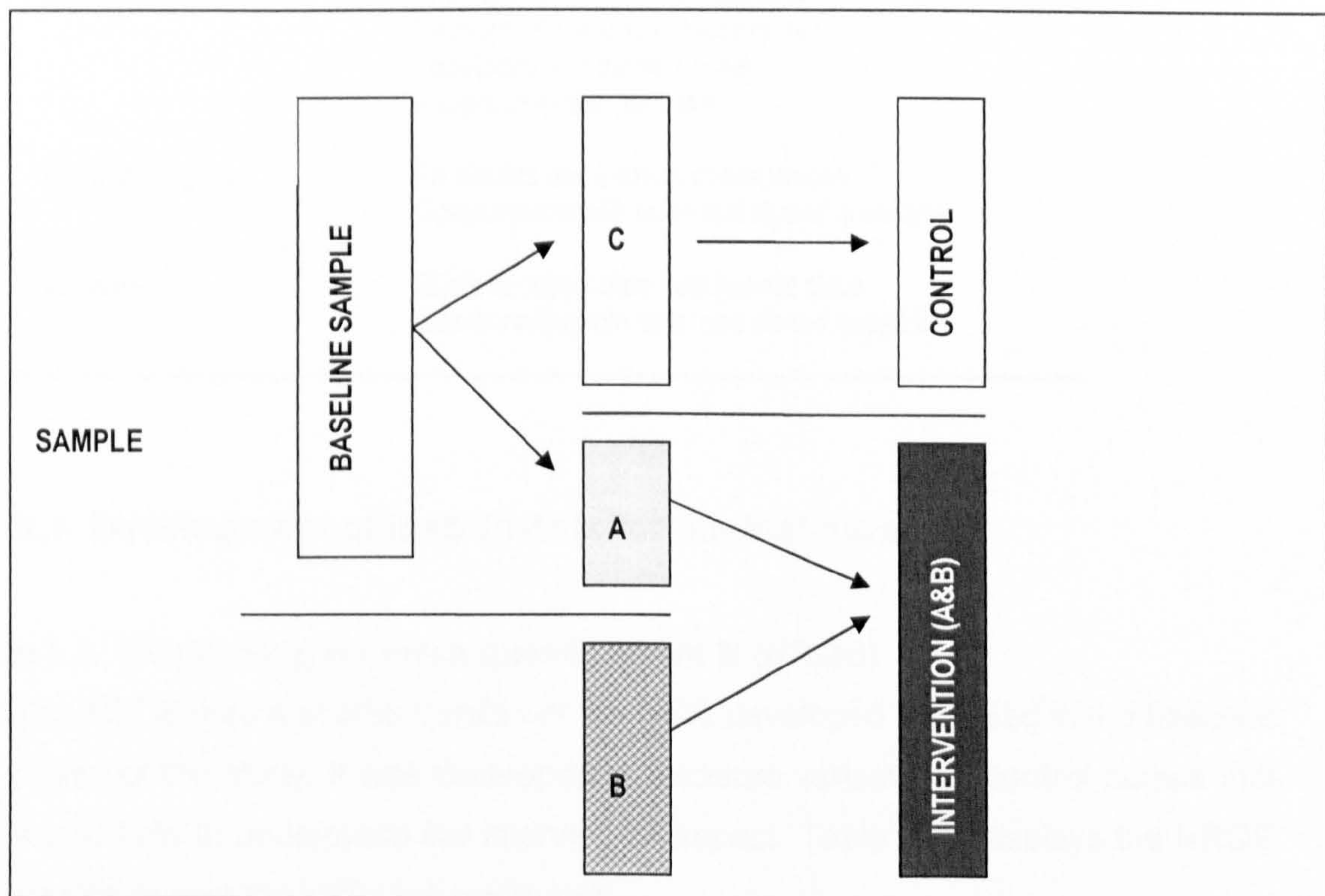
2.3.3. Evaluation phase

a. Sample and sampling

The evaluation sample consisted of three groups, mentors, ward managers and clinical nurses, all of them essential to understand the intervention outcomes and mechanisms. The group of mentors comprised the six mentors who participated in the intervention and the group of ward managers included the WM of the nine hospital wards included in the development phase of the study, (N=11).

The evaluation by nurses was focused on determining the impact of the intervention on the two principal outcomes of the study: nurses' 'research capability' and 'research related activity'. To do so, the sample of nurses was divided into two groups, intervention and control groups, regarding whether they participated in the intervention. The following Figure 2.2 illustrates how both groups were created.

Figure 2.2 Sampling strategy for control and intervention nurses



As can be seen in Figure 2.2, the baseline sample was split into two subgroups called A and C. Group A represents nurses participating in the intervention and group C, the control group, nurses who did not take part in the intervention. In the development phase of the study, a new group of nurses was included: group B;

nurses who did not participate in the baseline phase because data collection was done in hospital wards and they were not working there, but who did participate in the intervention activities, research courses and JC, offered to the whole hospital. Therefore, the final intervention group of nurses was composed by A and B subgroups. The control group consisted of 81 nurses and the intervention group of 97 (Group A: 15 and Group B: 82).

b. Evaluation instruments design and pilot work

Several instruments were designed and used in the evaluation phase of the study. As in the baseline phase section, this part of the chapter will be organised regarding the instruments developed for each group of participants. The following Table 2.16 summarises the instruments used in this phase.

Table 2.16 Data collection instruments in the evaluation phase

Group of participants	Instruments
Clinical Nurses	The nursing research Questionnaire B (NRQB) Research Knowledge objective test Facilitators and barriers scale Journal club questionnaire
Ward Managers	Facilitators and barriers questionnaire Questionnaire with open and closed questions
Mentors	Guide to collect data from journal clubs Questionnaire with open and closed questions

b.1. Development of instruments for clinical nurses

b.1.1. The nursing research questionnaire B (NRQB)

The NRQB was a shorter version of the NRQ developed and used in the baseline phase of the study. It was developed to measure variables in control nurses that would help to understand the intervention impact. Table 2.17 displays the NRQB questions and the variables measured.

Table 2.17 NRQB: questions and variables

NRQ Items n° (Appendix 7)	Type of questions	Variables
12 and 14	Closed	Research training and knowledge
13	Likert scale	Research skills
17	Likert scale	Attitudes towards nursing research
18	Open	Opinions about nursing research
24	Likert scale	Reading/ use of material resources
	Closed	Participation in research activity
	Open	Facilitators and barriers

b.1.2. The research knowledge objective test

This instrument was developed to obtain objective information about nurses' research knowledge before and after the intervention. To develop the instrument mentors were asked to formulate six questions each, three basic and three more advanced, about research methods. These questions were reviewed independently by three people with research experience and involved in the study and the intervention design. Afterwards, discussion took place and agreements were achieved. Some questions were considered not to be relevant or to be too advanced and were removed. A few more general questions were added about how to read a paper. Finally, a draft of the tool was developed. It had a total of 20 structured questions with four answer options (Appendix 17).

The tool was piloted to enhance its validity and reliability. Ten clinical nurses working in the intensive care unit, accessed through ward managers, were asked to participate in the pilot study, which involved qualitative and quantitative approaches. The validity was improved by the review of the instrument by different researchers. Moreover, to study the face validity, participants were given a blank sheet to write any additional comment about the tools. The comments were positive, saying that the test was easy to understand and to complete. To check the internal and external reliability of the tool, Cronbach's alpha tests and test re-test were done (T1 represents the first time the questionnaire was answered and T2 the second time). Values obtained at T1 and T2 were compared using the t-student test and the intraclass correlation coefficient. The t-student test gave no significant differences ($t=0.094$; $p=0.927$) and the correlation coefficient was 0.7, value considered as acceptable (Polit and Beck 2008; Gerrish and Lacey 2006; Yen and Lo 2002; Redfern and Norman 1995), indicating an adequate stability of the instrument.

b.1.3. The facilitators and barriers scale

This instrument was designed to obtain information about changes in nurses' perceptions regarding facilitators and barriers to read and participate in research activities in their wards. To do so, a scale was developed from the data obtained in the baseline phase through the NRQ, which included a section about barriers and facilitators for research development. An extensive list of facilitators and barriers was obtained from their answers, including the most often identified factors, and grouped into broader themes. Table 2.18 summarises the themes considered as the influential factors for research development.

Table 2.18 Themes and items of the facilitators and barriers scale

Themes	Number of items (N=27)
Time	4
Ward managers' support	3
Material resources and communication channels	4
Knowledge	3
Attitudes/ motivation/ Interest	6
Work organization	2
Personal habits	1
Language	1
Experts' support	1
Research impact in nursing practice	2

This list of themes was reviewed by three researchers and items were generated for each of the themes. The barriers' scale, developed by Funk et al (1991), was used as a template for the tools' structure. The first draft of the instrument was composed by 27 items and two open questions to capture any influential factors that might not have been included (Appendix 18).

The scale was piloted to study its reliability. The validity of the tool was already assured as it was developed from empirical data obtained from the sample of nurses. Thus, the themes were relevant for them. To check the reliability, the same sample and procedure followed with the research knowledge objective test was used. Only a minor change was made in the final version of the scale, two items, which were very similar, were unified in one. Cronbach's alpha values varied from 0.6 in T1 to 0.787 in T2. The values obtained in T1 and T2 were compared using the t-student test and the intraclass correlation coefficient. The t-student test gave no significant differences ($t=0.697$; $p=0.50$) and the correlation

coefficient was 0.874. These results indicated an adequate stability of the instrument.

b.1.4. The journal club questionnaire

This tool was a simple and short questionnaire, with a total of six structured and open-ended questions, designed to collect information about the journal clubs, nurses' perceptions and interest, and their effectiveness (Appendix 19).

b.2. Instruments for ward managers

The approach to collecting evaluation data from ward managers was more qualitative, using instruments with open questions that allowed capturing their perceptions about the intervention and its mechanisms. A qualitative approach for evaluation data collection was already used in a realistic evaluation study and it was useful for the development of CMO configurations to explain causality (Byng et al 2005).

Two short questionnaires were developed with open-ended questions. The first was focused on the perceptions of barriers and facilitators for nursing research and the WM's expectations regarding nursing research development in their wards (Appendix 20). The second questionnaire was designed to collect information regarding their opinions about the intervention and the contribution of the different activities (Appendix 21).

b.3. Evaluation instruments for mentors

Two evaluation instruments were used to collect data from mentors. A guide to collect information about journal clubs (Appendix 22), and a short questionnaire, with closed and open-ended questions, about their perceptions of the whole intervention and activities, changes in the research culture and their experience as mentors (Appendix 23).

c. Evaluation data collection

The aim of the evaluation was to determine the outcomes of the study and understand *why* and *how* the intervention worked, using the realistic evaluation approach. The evaluation phase of the study started in March 2007 and finished in February 2008. It was divided into two parts, one of which overlapped with the development phase. The evaluation of the RCO and WMS took place in March

2007 and the evaluation of the JC and the whole intervention was done in February 2008. Data from the different groups that participated in the intervention was collected to evaluate its impact and understand the mechanisms. The instruments explained in the previous section of this chapter were used for data collection. Table 2.19 summarises this part of the study.

Table 2.19 Evaluation phase

EVALUATION PHASE	WHY?
Evaluation with ward managers	To determine measurable outcomes of the project following a realistic evaluation methodology.
Evaluation with nurses	To understand "why and how" the intervention works.
Evaluation with mentors	

c.1. Evaluation data collection from ward managers

The first part of the evaluation with ward managers was done in March 2007, after the WMS 'A nursing research culture'. The aim of this evaluation was to see whether their perceptions on facilitators and barriers towards research development in their wards changed after the seminar and to understand the reasons for this. To do so, they completed the questionnaire (Appendix 20) twice, immediately before and after the seminar.

The second part of the evaluation was done in February 2008 to obtain information about their views after the whole intervention. Thus, they completed the second questionnaire developed for them about the barriers and facilitators and their opinions on the intervention (Appendix 21). The researcher went personally to the hospital wards to meet ward managers, give them the questionnaires and collect them after a few days.

c.2. Evaluation data collection from clinical nurses

The evaluation with clinical nurses was also divided into two parts: March 2007 to evaluate the outcomes of the RCO and; February 2008 to evaluate the long term outcomes after the whole intervention year. There were three times for evaluation, T1, T2 and T3. T1 and T2 occurred in March 2007, before and after the RCO. Nurses in the intervention group completed two instruments to measure possible differences in their research knowledge and perception of barriers and

facilitators (Table 2.20). This was done in the classroom immediately before starting the course and when it was completed.

The second part of the evaluation, T3, was done in February 2008. Intervention nurses completed several instruments to assess the intervention impact on their perceptions regarding research, barriers and facilitators, their research knowledge and on the use of material resources. Information about JC was also collected from nurses at T3. Besides, control nurses completed the NRQB at T3.

A postal survey was conducted to collect the evaluation data at T3. Personal envelopes, with a covering letter and the instruments, were prepared for nurses. The distribution and collection of questionnaires was done with the cooperation of ward managers

The following Table 2.20 summarises the evaluation data collection with clinical nurses.

Table 2.20 Groups of nurses and evaluation instruments

Time	T1, T2, T3	T1, T2, T3	T3	T3
Tools	Research knowledge test	Facilitators & barriers scale	JC questionnaire	NRQB
Groups				
INTERVENTION	X	X	X	
CONTROL				X

c.3. Evaluation data collection from mentors

Different sources of information were used to collect evaluation data from mentors. Mentors were asked to complete the guide about JC after each session and send it to the researcher by email. Besides, they kept a diary about the work done with ward managers for nursing research development in the different hospital wards. These two sources of data, together with the meetings held periodically with them, allowed the researcher to obtain continuous information about the intervention and its implementation.

In addition to this, in February 2008, the mentors completed a questionnaire to gather information about their general views on the intervention, the different activities conducted and suggestions for future activities (Appendix 23). The

researcher gave the questionnaires to mentors in person and collected them after a few days.

Table 2.21 summarises the most relevant aspects of the development and evaluation phases of the study. It includes the intervention activities, the hypothesis, the variables, and the evaluation procedure.

Table 2.21 Intervention procedure summary

Hypothesis/ Research questions	Variables	Tools	Evaluation	When?
There is an effect of the WMS in WM attitudes, interest and understanding towards nursing research and their perceptions of barriers and facilitators towards nursing research	Attitudes Interest Understanding Barriers Facilitators	Open questions about barriers and facilitators Questionnaire with open and closed questions	Pre and post WMS	March 2007 February 2008
There is an effect of the RCO in CN understanding and in research knowledge	Knowledge	Research knowledge objective test	Pre and post RCO	March 2007 & February 2008
The JC will have an effect on CN use of material resources and their research knowledge and skills.	Use of material resources Knowledge Skills	Questions about use of material resources	Pre and post JC	February 2008
There is an effect of the interventions (RCO, JC, MN) in CN perceptions of existing barriers and facilitators for nursing research	Barriers Facilitators	Research knowledge objective test Facilitators and barriers scale	Pre and post intervention	March 2007 February 2008
There is an effect of MN in WM perceptions of barriers and facilitators	Barriers Facilitators	Questionnaire with open and closed questions	Pre and post intervention	March 2007 February 2008
What is the WM general perception of the intervention and its activities?	Perceptions	Questionnaire with open and closed questions	After the whole intervention	February 2008
What is the CN general perception of the intervention and its activities?	Perceptions	JC questionnaire Open questions in questionnaires	After the whole intervention	February 2008
What is the M general perception of the intervention and its activities?	Perceptions	Diary Meetings Guide for JC Questionnaire with open and closed questions	During and after the intervention	Continuous from March 2007 to February 2008

2.4. Data analysis

2.4.1. Quantitative analysis

Quantitative data were statistically analysed using the SPSS (v.15.0) package. Questionnaires were coded in SPSS 15.0 to prepare data for analysis. The coding was done and checked by two people, the researcher and an assistant, to avoid mistakes when entering the data. The variables of the questionnaire were divided into four groups regarding their levels of measurement: ratio, interval, ordinal, and categorical nominal variables (Martínez-González et al 2006; Munro 2005; Martín and Luna 2004). Most of the variables belonged to the last three categories.

Considering the sample size of this study, the normal distribution could be assumed (Martínez-González et al 2006; Munro 2005; Martín and Luna 2004; Lumley et al 2002). Therefore, the level of measurement of the variables was the determinant factor that guided the decision for using parametric or non-parametric tests.

Descriptive, bivariate and multivariate analyses were performed. The descriptive analysis was done using the mean and standard deviation for ratio and interval variables and percentages for nominal and ordinal variables (Martínez-González et al 2006; Munro 2005; Martín and Luna 2004). The descriptive analysis offered a general overview of nurses' demographic characteristics, research capability and research experience. Moreover, it gave an idea of the research activity conducted by clinical nurses in the different hospital wards.

Exploratory factor analysis was conducted for the 'attitudes towards research' scale, with principal components analysis as the method of factor extraction, to identify the underlying factor structure of the scale (Watson et al 2005). The Kaiser-Meyer-Olkin coefficient and the Bartlett test of sphericity were taken into account. Oblique factor rotation was used to identify latent factors. The extraction was based on scree plot visual interpretation and Kaiser's criterion for Eigenvalues of equal to or greater than unity. Moreover, the Monte Carlo PCA for Parallel Analysis test was done.

The realistic evaluation framework guided the analysis to identify relationships between contexts, mechanisms and outcomes (Table 2.1, p.49), that informed the intervention design and implementation. Different tests such as, ANOVA; t-student, Pearson correlations and Chi-square were used to look at relationships between the variables. The PEPI program (Abramson and Gahlinger 1993) was used as the exact test for 2xK contingency tables to calculate the exact p value (mid-P). Welch's t test was used when the two samples had possibly unequal variances, as an adaptation of Student's t-test (Martínez-González et al 2006; Martín and Luna 2004). Fisher's exact test was used as a statistical significance test for the analysis of categorical data where sample sizes were small or the data were very unequally distributed among the cells of the table (Martínez-González et al 2006; Munro 2005; Martín and Luna 2004). The Fisher test is exact and allows obtaining more accurate analysis in the cases mentioned above (Martínez-González et al 2006; Martín and Luna 2004). The level of significance for all the statistical tests was established at $p \leq 0.05$.

A linear regression model for research related activity was created taking into account the results obtained in the bivariate analysis. Those variables that were statistically related with nursing research activity were introduced into the model to determine their simultaneous effect on the dependent variable, the research activity (Polit and Beck 2008). This kind of analysis is helpful to provide a more comprehensive picture of the most important independent variables that influence a dependent variable (Díaz de Rada 2002).

Subsequent to the bivariate and multivariate analysis, path analysis was carried out to assess simultaneous relationships among variables. 'The aim of path analysis is to provide quantitative estimates of the causal connections between sets of variables' (Bryman and Cramer 2005, p.314). In other words, it studies the pattern of relationships between three or more variables. To do so, a path diagram is developed. It is a hypothesised model constructed based on statistical results or a theory. This model, represented in the path diagram, makes explicit the likely causal connections between variables (Bryman and Cramer 2005). The variables introduced in the model are linked by causal paths represented by arrows which indicate the expected causal connections between them. The meaning of these connections is that a change in the variable at the tail of the arrow will result in a change in the variable at the head (Loehlin 2004). In addition to the arrows connecting variables, further arrows coming from outside directed

to dependent variables should be included in the model. These denote the amount of unexplained variance in the dependent variable and should be included in the model to explain the influence that other variables not considered for the path analysis could have on it (Bryman and Cramer 2005).

Estimates of the postulated paths need to be provided and to do so, path coefficients are computed. These are standard regression coefficients. To calculate the coefficients, equations stipulating the structure of the relationships are set up and treated as multiple regression equations (Bryman and Cramer 2005). 'The resulting standardised regression coefficients provide the path coefficients and the errors, or unexplained variance, are calculated by taking the R^2 away from 1 and taking the square root of the result of this subtraction' (Bryman and Cramer 2005, p. 315). R^2 gives a measure of how well the model is likely to fit in the population and values over 0.3 can be considered as moderate and strong fit (Muijs 2004).

In this study, a hypothesised model was constructed based on the significant relationships found in the bivariate analysis and following the CMO configurations. Pre and post intervention comparative analysis was carried out to compare baseline and evaluation results to determine the impact of the intervention. The ANOVA test for repeated measures and t-tests for paired samples were used in the comparative analysis.

2.4.2. Qualitative analysis

In this study, qualitative data came from open questions in questionnaires and focus groups. The qualitative data gathered through questionnaires was content analysed. The responses to the questions were reviewed to identify categories that were grouped into themes. These categories were 'quantified' using frequencies or numbers that were useful to describe the results. Content analysis is one of the most used method of analysis in qualitative data (Polit and Beck 2008; Cormack 2000).

In focus groups data came from observations, conversations and notes, so the analysis combined different elements. There are several approaches to analyse focus groups transcripts and it is recommendable to have a clear idea of which

one will be followed before starting the data collection (Silverman 2005; Burns 2004).

The method of 'Thematic content analysis', described by Burnard (1991) from previous works on content analysis, especially for semi-structured interviews, was considered to be a good approach for data analysis of qualitative data. It is a method that provides a detailed and systematic recording of the themes and issues addressed during data collection under an exhaustive category system that comprises 14 steps (Burnard 1991). It requires the full transcription of records and encourages the researcher to keep close to the original transcripts.

In this study, the method of thematic content analysis explained by Burnard was adapted and some of the steps were followed for the analysis (Pope and Mays 2006; Burnard 1991):

- During the focus groups, notes were taken by the assistant regarding non verbal observations. Afterwards, a debriefing was held between the moderator and the assistant and memos were written regarding the sessions. All these steps were helpful to gather as much information as possible and to become familiar with the data.
- The sessions were tape recorded and all the data, including the notes, were fully transcribed by the researcher to start immersion in the data.
- Transcriptions were read and re-read to start identifying an initial set of categories. This step was called 'open coding' (Burnard 1991): categories were freely generated to provide a comprehensive description of the data.
- The first list of categories was reviewed and read to identify overlap or repetition. These categories were grouped under higher level subheadings (themes) because they were related under the same heading.
- Each transcript was then coded with the list of categories and the coded sections under the same categories were put together and organised under the appropriate subheading or theme.
- A colleague, the assistant who participated in the focus groups, was asked to repeat the process with one of the transcripts and the lists and coding were reviewed and discussed.
- When writing up the findings, each section was described using the themes and categories and quotations were used to illustrate them.

- The assistant at the focus groups was asked to review the final report because she was familiar with the data (she participated in the three focus groups and in the triangulation with my results).

A computer package, Nvivo 2.0, which facilitates data storage, data handling and some aspects of the analysis, was used for data analysis (Morison and Moir 1998). Some of the most important advantages of this program are that it permits a flexible coding system (new codes could be continuously added) and that it offers search facilities and the possibility to view texts retrieved in its contexts. It could help to enhance rigour in the study (Silverman 2005; Morison and Moir 1998) but, by any means, could be used as a substitute of the researcher's reflective and analytic work.

The focus groups were conducted in Spanish, as well as the analysis and coding of transcriptions. Only at the end, the themes and quotations were translated into English. The translation was made by the researcher, person who conducted the sessions, transcribed the records and did the analysis.

Rigour and credibility in the qualitative analysis

Its lack of scientific rigour has been an often criticism to qualitative research (Denzin and Lincoln 2003; Britten 1995; Miles and Huberman 1994). The most common criticisms are that it does not produce generalizable findings, it is subject to researcher's subjective bias, and that it lacks reliability (Pope and Mays 2006; Denzin and Lincoln 2003; Pope et al 2002; Morse and Field 1996; Miles and Huberman 1994).

Qualitative researchers should try to follow all the process in a systematic way that allows other researchers to do things in the same way and reach similar conclusions. When interpreting data, it is essential to recognise the researcher's impact on the whole process (Pope and Mays 2006; Silverman 2005; Pope et al 2002; Rose and Webb 1998; Morse and Field 1996). Therefore, it is important to make a reflexive overview of the researcher's background and other factors that will have an effect on data interpretation. In this case, the researcher was familiar to ward managers and this was considered.

In this study, several steps have been followed to ensure the rigour of the qualitative analysis (Barbout 2001; Sandelowski 2000, 1993, 1986; Guba and Lincoln 1981).

To increase the consistency meticulous records of focus groups, memos and transcriptions have been kept. All the focus groups were tape-recorded and fully transcribed by the researcher in order not to lose any potentially important details. In addition, memos were written by the researcher after each session. Some authors have stated that these notes can be a good approach to help to ensure rigour because 'they are analytic in themselves and contain immediate and later perceptions and thoughts about informants' (Rose and Webb 1998, p.560). These steps helped in the analysis and in the elaboration of a comprehensive final report capturing the 'real essence'. In addition to this, researchers' triangulation, which consists of having an independent assessment of analysis by an additional researcher and comparing results, was done in this study. Experts on qualitative methods did part of the analysis separately to assure consistency (Barbout 2001; Rose and Webb 1998; Burnard 1991).

A technique strongly recommended in the literature to ensure the truth value or credibility in the analysis is the 'member checking'. It consists of showing the analysis to participants checking whether they think that their accounts are well-represented (Silverman 2005; Sandelowski 2002; Mays and Pope 1995; Miles and Huberman 1994; Sandelowski 1993). In this study, after each focus group, participants' verification and a debriefing between researcher and assistant were conducted. All this helped to ensure an objective interpretation of data and allowed to capture the important issues and to verify interpretations.

In addition, some key characteristics of focus groups analysis were taken into account to improve the quality of the process (Krueger and Casey 2000; Morgan and Krueger 1998; Reed and Roskell 1997). For instance, it is important to bear in mind that the analysis tries to find patterns, making comparisons and contrasting data within and between groups. The complexity of focus groups analysis is high as in addition to considering the words, the context and the intensity of comments, it is also important to observe the internal consistency of respondents. Sometimes, participants change their opinions throughout the discussion and it is important to identify what has made that person change his mind. Moreover, the complexity of groups' interaction should be considered in the

analysis looking at: participants' influence on each other, shaped opinions or silences.

2.5. Specific risks and ethical issues

This study was approved by the Ethics Committee of the University Hospital of Navarra (Appendix 24). Ethical permission from the University of Sheffield was also sought (Appendix 25). The principal ethical issue that could have arisen with this study was that nurses, especially those with temporary contracts, could decide to participate in the project under pressure because they may be afraid that a negative could have a repercussion on their professional situation. To avoid this, they were informed about the free character of their choice, about the fact that any decision they take would not interfere in their professional situation and the possibility of withdrawing the study at any time they wished without providing any explanation. Moreover, participants were adequately informed about the study and had enough time to decide whether they wished to take part on it. Anyone declined to participate or withdrew at any point of the study.

Another important ethical issue could be related to the focus groups run with WM because they could have felt intimidated to talk in public or in front of their colleagues. To overcome this, all participants were given the chance to take part in an individual interview if they preferred or felt the need to discuss in privacy any aspects. Participants were asked permission to tape-record the focus groups and they signed a consent inform.

2.6. Confidentiality

The researcher explained to participants that the information they provided was confidential. Respondents gave their names to the researcher due to the need to track them personally for the evaluation. This information was kept in separated sheets and the questionnaires were coded to avoid identification. Only the research team had access to the data. Nobody else had the information to match the questionnaires with respondents. It is absolutely necessary to guarantee the security of the data collected; therefore, data were stored on a password-protected personal computer, in a locked room. A backup copy of all the data and the informed consents were taken and stored securely. The diffusion of the results will be carefully done in order not to make it possible to identify

respondents (McCull et al 2001). The transcriptions of the tapes with the focus groups were all made by the researcher with nobody else in the room, to avoid the possibility of recognition of participants by their voices. No other person had access to the tapes. All the recordings, field notes and transcriptions will be erased and destroyed two years after completion of the study.

In conclusion, the study followed the data protection principles set out in the Data Protection Act 1998 (Carey 1998) and in the Spanish Organic Law of Data Protection (Jefatura del Estado 1999), conforming to the principles of research, as well as to the principles relating to ethics, science, information, health and safety and finance set out in the framework of the Research Governance Framework for Health and Social Care.

Chapter 3. Results

This chapter will start with the results of the baseline phase of the study. In this phase the sample was composed of ward managers and clinical nurses. The chapter will then present the evaluation phase of the study, in which the impact of the intervention was evaluated through clinical nurses', ward managers' and mentors' points of view. The evaluation phase took place over the whole year in which the intervention was being implemented.

3.1. Baseline phase results

The information obtained in the baseline phase of the study was gathered to help to understand the nursing research culture in the hospital and to design the intervention.

3.1.1. Baseline results from ward managers

Two different methods for data collection were used to obtain the information from ward managers: a questionnaire and focus groups, being the later the main source of data.

Demographics, academic and professional profiles

Thirteen ward managers of hospital wards participated in the study. The ward managers' demographic data and academic and professional profiles are summarised in Table 3.1.

Table 3.1 Ward managers' demographics, professional and academic profile

Characteristics	
Demographics	
Female	100%
Age (years)	m*=46.7 (SD**: 8.59)
Married	67%
Single	33%
Professional profile	
Year of qualifications	m=1978 (1964-1991)
Years of professional experience as a nurse	m=12 (SD:5.81)
Years of experience as ward managers	m=12 (SD:11.22)
Academic profile	
Educational qualifications	
BSc (Bachelor)	92%
MSc (Master)	8%
PhD (Doctor in Philosophy)	0%

*mean; **standard deviation

In the following section, ward managers' results classified in three major themes, which arose in the analysis of qualitative data, are presented. These themes are:

- a. Understanding of nursing research
- b. Ward managers' role regarding nursing research
- c. Influential factors in nursing research development

a. Understanding of nursing research

Ward managers were asked about what they understood by nursing research and their opinions about it. Their comments have been grouped into three sub-themes which include: 'the contributions of research to nursing and other health professionals', 'general opinions about nursing research' and 'the importance of the focus and the quality of research'.

The contribution of research to nursing was an aspect that arose in the three groups. Ward managers clearly saw that nursing research was essential for professional development because it helped professional growth by developing nursing knowledge and opening professionals' minds. In the three groups they also insisted on the fact that nursing research was essential to improve the way they worked because it was helpful for decision making and justifying nursing practice, especially changes to it. It was clearly noticed that all ward managers stressed that the major contribution of nursing research was in relation to patient care. This is illustrated in the following quotation:

FG2*

WM5.** To do research is to move forward in our knowledge with the aim of...improve the care...of patients, to improve the attention we provide to patients.

(*focus group; ** ward manager)

Another aspect that was commented on in the three groups was that nursing research contributed to professional satisfaction and enthusiasm because it motivated staff and helped them to avoid routine:

FG3

WM9. ...personal satisfaction...**WM11.** (Interrupts) to avoid the routine, to know why we are doing some things, critical attitude to improve those aspects of our practice that need to be changed, eh...open mind...I think that it (nursing research) contributes to many things...

In general, from their perspective, the experience of having some research activity being carried out in the ward had been positive. This was highlighted in all the groups, especially in FG1 and FG3, where they said that it was always very positive for nurses:

FG3

WM9. In our case the experience has been very participative and positive. We have done studies including them (nurses) and ...people have participated and got involved.

The research experience of most ward managers in their wards consisted of doctoral theses conducted by lecturers of the nursing school or projects done together between the hospital and the nursing school. Data about ward managers' specific research experience was gathered through the questionnaire: participation in research studies, publications, and participation in nursing conferences. Nearly half of the sample (46.2%) had been involved in nursing research studies over the previous two years, participating mainly in data collection (90%). Regarding publications the percentage decreased to 31%. The percentage of ward managers who attended a research conference in the last two years was 84.6%, being presenting oral communications the most popular way of participation (55.6%), followed by round tables (33.3%) and posters (11.1%).

Ward managers considered that participating in research activities helped them to be more reflective when they cared for patients and they found that it was satisfying to know that they were doing things well, filling gaps in nursing practice:

FG1

WM3. ...because we realised that we cared very well for the physical aspects of patients but there were other aspects that...also worried the patient, such as the social life...we did not cover at all.

In the third group, they also commented on the possible contributions of nursing research to other health professionals, as it helped to care better for patients. They insisted that this was only possible if the research done by nurses was of good quality and that this had not always been the case.

Ward managers held positive opinions about nursing research and its relevance, regardless of their experience and training in this field. They described nursing research using adjectives such as: it is 'essential', 'a nice field', 'very interesting and motivating'. However, participants also saw many difficulties stressing aspects regarding the difficulty of combining research activity with their daily work. They saw research as something they should do but they do not do. It was highlighted, mainly in FG1 and FG2, that there was no research culture in the hospital and the development of nursing research, although interesting, was not considered a priority in the organization. Their priority was the daily work and the patient, due to the fact that nowadays patients were more demanding and the workload greater:

FG3

WM8. ...the priority is the work with the patient...and it is already enough! **WM5.** Yes, patients are more and more complex...

FG1

WM1....we have very complex patients...and they are more and more demanding with nursing staff...patients and their families...much more than before... **WM3.** (Interrupts) Yes **WM1.** ...and...I think that this also has an influence on research...

Therefore, although they believed in the added value of research in patients' care, as the impact was not immediate, they did not take it into account when they set their priorities. This situation led research to depend exclusively on staff personal effort and interest:

FG1

WM3....that's the principal problem... **WM1**....(interrupts) the lack of time, lack of time... **WM3.** ...it is in your free time...you have to do it (research activities) at the expense of your time... **WM1.** **WM2.** Yes, yes **WM3.** ...and depending on your willingness, it (research) is done or not...it depends on the compromise of each one!

The importance of the focus and the quality of nursing research was discussed only in the third group, probably because these ward managers had more research knowledge and experience and were aware of the differences and the importance of the focus and quality of research. They insisted on the fact that many times the nursing perspective was not on the focus of the research and that this was not contributing to the development of nursing knowledge. The following

quotation illustrates this view, it was mentioned by one of the ward managers working in intensive care, who attended a Masters in Nursing research in Canada:

FG3

WM10. ...I think that nursing research is done, or has to be done, with the perspective...actually with the perspective of our profession, our discipline, otherwise...we will not really move forward in nursing (the rest of participants agree)

They also commented that, in Spain, the quality of nursing research was very poor because there was no tradition, experience and knowledge and therefore, there was no strong evidence to support its use in nursing practice. According to their views, this might be one of the principal reasons why the impact of research in practice was low. This is illustrated in the following quotation:

FG3

WM9. ...we have to do research...but serious research, I (moderator) **What do you mean by serious research?** **WM9.** ...good research, that really gives... determined steps. If you look for evidences, in nursing, there are very few evidences...strong evidences...

Ward managers' views about the research progress in the hospital differed among groups. In FG1 they were pessimistic and stated that they had not seen any progress over the last ten years in nursing research activity in their wards. They perceived that the research activity had been nearly abandoned:

FG1

WM1. ...we have it (nursing research) just abandoned... **WM2.** ...(interrupts) yes, we too... **WM3.**...the shame is that once you have put something in a corner...you tend to forget it

On the other hand, participants in FG2 and FG3 identified a clear increase in nursing research activity over the last few years, although, it is still at the initial stages, regarding its quality and rigour.

b. Ward managers' role regarding nursing research

Another theme that was explored in the focus groups was how ward managers saw themselves regarding nursing research. We looked at the role they considered they play in nursing research development in their wards and their answers mainly referred to 'motivating people' and 'being the leaders' of the research activity.

All the ward managers agreed that part of their responsibility was to promote nursing research activity in their wards. However, there were some differences

between and within groups regarding their perceptions about their specific role in research development. These differences were mainly regarding whether they perceived their role more as 'leaders' or as 'facilitators'. For instance, the ward managers who were more experienced and had more research activity in their wards clearly stated that their role was more directive because they had to lead the research activity and the groups. They saw themselves as the motor, they had to promote research to be conducted in their wards and to involve people:

FG2

WM7. ...you do not see it! (research activity) **WM5.** If the ward manager does not drive the research activity you do not see it... **WM7.** (interrupts) It is very difficult that people get involve... **WM5.** (interrupts) (the ward manager) is the one that should be driving... **WM3.** ...to promote people to do research...

They considered that if they were not there 'pulling', controlling, reminding nurses to do research and organising them, research activity would not take place in their wards because the daily work with patients was the priority and people did not feel the need to do it. The need to promote more autonomy among nurses by delegating the research activity to them was stressed.

On the other hand, the participants who had few years of experience as WM, did not consider that they had to play this leadership role. In fact, they insisted on the idea that they did not think that this depended so much on the ward manager. They said that in their wards they perceived that nurses wanted to do things and were motivated.

FG2

WM5. ...during the 3 research studies that we have carried out, the ringleader was me! **WM7.** I do have the feeling that nurses keep the project going... **WM8.** (interrupts) Yes, yes, not all, but yes... **WM5.** I am very glad to hear that!

One idea that arose very clearly in all the groups was that ward managers thought that they had to motivate their staff to be involved in research. Participants stressed that not every nurse had to be interested in conducting research studies. However, they considered that they had to find or identify those nurses who could do it and motivate them to participate in research activities, creating a group that could work together. One of the key points was to facilitate nurses to do it by encouraging them to go to the library during the shift, providing them with study days or compensating the extra hours. Nevertheless, they also stated that it was difficult to keep a balance because usually the same nurses that were keen to do research, were also keen to do all the other activities of the

ward, such as teaching, and therefore, at the end they ended up burned-out. Moreover, the rest of the staff could feel 'jealous' because they were not invited to participate.

FG2

WM6....I do egg people on...I involve nurses and they are always the same ones! The rest wash their hands of, they do not want... **WM7**.... you also know to whom you are asking for help and to whom do not... **WM5**. Yes, but those people that are continuously involved in the studies...at some point they get tired! **WM6**. No, mine do not get tired, but the others say: you always do things with the same people!

Also, ward managers highlighted, especially the youngest, that to motivate staff, they should be the 'role model' and had to be motivated and involved in research activities themselves. One of them said that when the staff was not motivated it was important to be self critical and ask themselves about the reasons because ward managers' attitude could be a determining factor.

One of the more experienced participants clearly held a different view regarding her role as ward manager. She stressed that, considering her experience, by trying to motivate nurses she did not get anywhere and that what had to be done was to force nurses to do research:

FG1

WM4. To motivate? More than to motivate you have to force people to do research!

One idea that was explored in the second group, and supported by the four participants, was the importance of being 'aware of the moment'. They stressed that the ward manager had to find the 'right time' to promote research activities in their wards. They highlighted that it was very important to bear in mind that depending on the moment and the workload, research may be welcome or not.

The identification of research themes was another aspect discussed in the groups. Ward managers in FG1 and FG2 stated that part of their role was to identify the research ideas or topics because nurses were not used to think about it:

FG1

WM4. Where do research ideas come from? Usually, from the ward manager, the ward managers, although this should not be always like this. Do nurses ask themselves aspects regarding their practice? No, no much.

This view was not shared by the most experienced ward managers. These participants highlighted the importance for clinical nurses of reading and being

research active to identify gaps or research priority areas. Moreover, they underlined the determinant influence of the working experience and reflexive practice to generate adequate research questions. Thus, nurses' attitudes (reflective or not) and practical experience were very important aspects regarding this issue:

FG3

WM10. ...research ideas arise from the worries or concerns that appear in the work **WM11.** depending on the attitude, daily practice... **WM9.** ...(interrupts) the nursing literature, it is essential, and the experience, essential! I. (moderator) Do you think that research ideas arise from nurses? **WM9.** From the ones that read

c. Influential factors in nursing research development

One of the themes that was explored in more depth in the three groups was the influential factors for research development in the hospital. It was necessary to explore these factors to understand the situation in the hospital and design an adequate intervention to enhance research. To do so, ward managers were asked about barriers to and facilitators for research and it was noticed that they were the same, and depending on whether they were happening, these were considered barriers or facilitators. The influential factors are summarised in Table 3.2.

Table 3.2 List of barriers-facilitators for research development In the hospital

Time	Staff motivation
Tradition and culture	Nursing school
Research programs	Resources
Knowledge and training	Ward organization
Support	Visibility of research
Research impact on practice	

Time was a very important issue which allegedly inhibited research development. The research activity had to be conducted out of the shift and nurses had other priorities (family, children) in which to spend their free time. Most of the ward managers considered that if they had less workload shifts, with some free time, nurses would participate more in research activities. However, there was disagreement regarding whether the lack of time was real because there were many moments, mainly in the afternoon and during the night shifts, when nurses lose time chatting, taking coffee or reading magazines:

FG2

WM6. ...go to the wards at 3:30 pm... WM5. they (nurses) will be taking coffee WM7. I do not mind!
WM6. And at 9pm eh? And at 8 o'clock in the morning...? WM5. Yes, I know

Thus, their opinion was that although time was available, people got accustomed to not putting the effort into studying or reading. The youngest ward managers agreed with that but their view was different because they considered that these relaxing moments were essential for the 'well-being' of the ward.

Another issue related to time was that, sometimes, they did not make good use of it because there was a lack of culture among nurses to do research, read papers, or to go to the library. Thus, ward managers showed that there was not exclusively a problem of lack of time but also a lack of **research tradition and culture** that led them to not doing research activities even when they had moments in which they could. Participants considered that having a **research program** with the research priority areas in the wards, that helped them to know what to do and to keep a continuity of the research activity during the whole year, could be an important facilitator.

Another important limitation was the **lack of training** of both, nursing staff and ward managers. As already explored, ward managers considered that part of their responsibility was to enhance nursing research activity in their wards. However, most of them did not know how to do that because they lacked knowledge, less than half of the sample (46%) had received specific training in nursing research. Apart from the person who had the Masters degree, the rest of the ward managers received this research training in short seminars or courses organised by the School of Nursing or the Nursing Council. Therefore, as ward managers did not feel confident enough, they did not promote research activity among their nurses as much as they should:

FG1

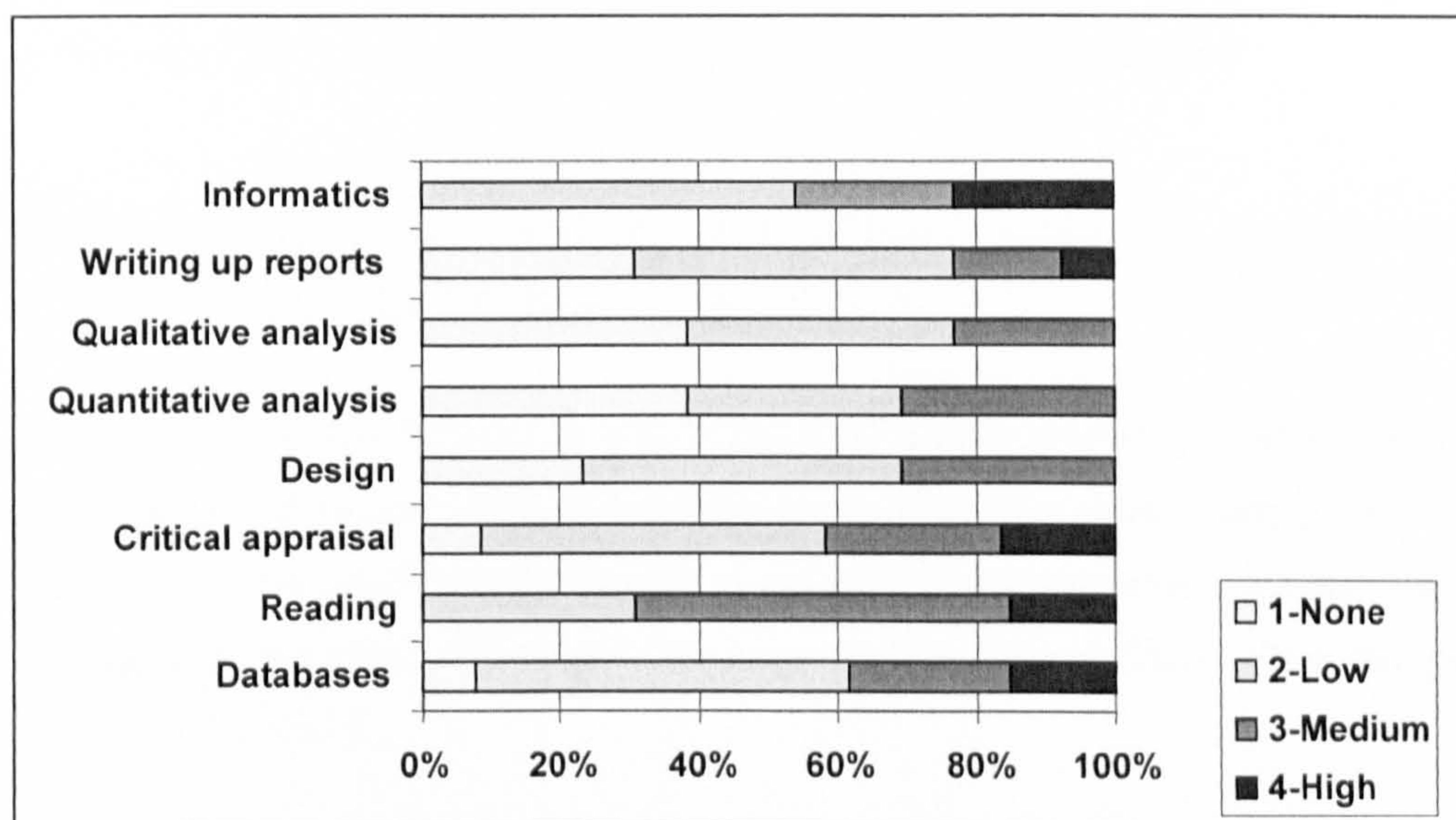
WM1. If I had more knowledge, maybe I would get more involved, because now I feel insecure...it (research) is something that I do not know about and therefore, I prefer to get involved in other things that I feel more in control...

These perceptions were supported by the results obtained through the questionnaire. When ward managers were directly asked about their knowledge regarding nursing research, 69.2% rated it as 'none' (15.4%) or 'low' (53.8%) and only 30.8% classified it as medium or high. Although two out of 13 ward

managers considered their knowledge as high, 100% of the population stated that they would like to receive further training in nursing research.

More concretely, considering their level of research skills, the two areas that were rated highest were 'reading research articles' (mean: 2.8, SD: 0.69) and 'informatics' (mean: 2.69; SD: 0.85), although in both cases, participants considered their level of skill as being between 'low' and 'medium'. On the contrary, regarding 'analysis of quantitative and qualitative data' with means of 1.96 (SD: 0.92) and 1.84 (SD: 0.80) respectively, they considered their domain between 'none' and 'low' (Figure 3.1).

Figure 3.1 Research skills



Regarding nursing staff research knowledge the WM perceived a clear deficit. They considered that nurses were not prepared to do research and, therefore, it was extremely complicated to conduct any research activity with them. In FG3 participants stressed that, although not every nurse had to be trained to conduct research studies, they should know how to read a scientific paper and to do a basic appraisal of it, to be competent consumers of nursing knowledge and improve practice. They mentioned another important barrier for research development which was language because most of the papers were published in English and those in Spanish lacked quality and rigour. Another aspect that they considered essential for the development of a research culture was to have a group of well trained nurses with research capability that could take a leadership role to enhance research in the different wards. However, at the moment, they

did not have enough trained people in the hospital to do this and they perceived it as a limitation:

FG3

WM10. ...I really do see the great problem in the capability **WM12.** (interrupts) in the capability. For instance, in my department I do not have...I do not have people with the capability; I do not have people that know and are interested in research

Taking into account the lack of knowledge of clinical nurses and the impossibility of having research leaders in the different wards, ward managers pointed out that having the help and support of research experts would facilitate nursing research development. **Research experts** should be people with higher academic preparation and good leaders with authority to be a reference, helping them to identify research priority areas, to create research teams, maintain the continuity of the research activity in the wards, and to supervise the studies:

FG1

WM1. ...the perfect situation? if we all had more research training and somebody with more knowledge that could supervise us...who could say: listen! we could do this study...and we would be glad to do it! but we miss this! **WM3.** the drive

Ward managers underlined the importance of having research leaders working in the hospital, as it guaranteed that they were living the same reality and did not come from different contexts. However, it was commented that the main research support was received from the School of Nursing where there were the people with more capability.

Other sources of support were identified in the groups: hospital managers, doctors and peers. Most of participants did not feel supported by the managers of the hospital. They did not feel that the development of nursing research was a priority in the hospital as no facilities were provided because they still hold the idea of *'you have to work, not do research'*.

Regarding doctors' support there were contrary opinions. Participants with more experience considered that they did not have the support from doctors because of their lack of understanding of nursing research. Moreover, they stated that, as both disciplines had different perspectives, doctors could help only when nurses took over the study, otherwise, it could be 'dangerous' and become something other than nursing research:

FG3

WM11. ...the research areas of doctors **WM9.** (interrupts) They go separately! What can you do in the valvular reparation? **WM11.** Nothing, I am not interested at all **WM9.** What doctors want is quiet people that collect their data! **WM10.** We already have a huge research area, all about nursing care...

Nevertheless, other ward managers, especially one in FG2, who had research experience, stressed that she usually did research with doctors, that she felt supported and that this collaboration was essential because they had more research knowledge and nurses could learn much about research from them. She highlighted that the support received from doctors was mainly regarding the methodological aspects of the study.

Regarding the support received from **peers**, participants stressed that, in the hospital, there was the general belief that nursing work should be at the bedside and therefore it could be criticised when a nurse left the ward to go to the library to dedicate some time doing research activities. However, participants considered that for nurses involved in research, it was important to feel that they were supported, respected and understood by their colleagues, otherwise, nobody would be willing to participate in research activities to avoid conflicts with their colleagues or receive a different treatment. In FG3, participants with more experience doing research stressed that, in general, they did not receive support and felt alone, without any acknowledgment from peers, that people did not understand them and nobody paid attention to what they were doing. They considered that the main reason for this was the situation in Spain and the lack of a nursing research culture in the hospital. Therefore, nurses did not value any research activity conducted in their ward. Nurses mainly worried about the extra effort and workload that a research study might imply for them instead of considering the potential contribution that it would have in nursing practice.

This situation seemed to be related to the lack of perceived **research impact on practice**. Participants underlined that research findings did not really inform nursing practice. This fact was mainly commented in FG3. They stated that, although they had achieved interesting and relevant research findings that were not difficult to introduce in the hospital, they could not use them in practice. They found that hospital managers did not pay attention to them and that they could not do anything. Sometimes they had the experience providing hospital managers with strong evidence of the need for some changes, but financial interests hindered the process. Thus, they felt that their views were not listened

to. Research results only had an impact on practice when changes were 'small' and 'no disturbing' for the rest of the hospital and this situation was very frustrating:

FG3

WM9. ...you are not heard/listened by superiors... Eh...nurses are taken into account? maybe for small things, when we do not disturb anybody, when the effort depends exclusively on us and nobody notices it: we have to make postural changes to patients twice in an hour in stead of once...ok, do it, but when other professionals have to intervene...I think that we are not taken into account!

This situation was not helping nurses to support and value nursing research, as they could not see the benefits in their practice and, therefore, saw it as a waste of time. They talked about the 'moment', saying that until now there was no nursing research culture in the hospital and that with the European Convergence this will change. Therefore, the right time to be heard and taken into account, regarding research evidences in nursing, could be imminent.

Staff motivation and interest towards research was also perceived as a key element for research development:

FG1

WM1. We do not have the staff motivated **WM2.** (Interrupts) No, no **WM1.** We do not have time, we are not motivated... **WM2.**...people find excuses...

According to ward managers, the level of motivation of nursing staff differed regarding the ward and seniority: nurses who had been working for many years felt uninterested and were burned-out, while recently graduated nurses, especially those with temporary contracts, were more motivated to do research activities. Moreover, in FG3, they highlighted that an aspect that had direct impact on decreasing nurses' motivation, and was related to the lack of a research culture in the hospital, was the fact that being involved in research activities was not compensated and that did not have any relevance for career development. Ward managers commented that they usually worked with the same group of nurses and these had to sacrifice their free time without receiving any compensation.

In the three groups, participants agreed that the fact that they were working in a University hospital was extremely relevant and helpful for research development. Therefore, they all insisted on the crucial role that the **School of Nursing** played in this issue. They showed this role mainly regarding two aspects: the approach

for nursing education and the collaboration between the academic and practical worlds. Regarding the educational aspect, participants stressed that the approach used until now had not helped research development because it made students play a too passive role. Participants talked again about the lack of a research culture among nurses as they were not used to going to the library, to reading, and did not have the habit of studying. Participants believed that the School had the possibility to make nurses aware from the beginning of the relevance that research had for professional development, narrowing the gap between research-theory-practice. They stressed that the Nursing School held the key to preparing nurses to see the patient as a whole, have an open mind, be reflective in the way they work, have curiosity and ask questions about their practice. Also, they could introduce more research training in the basic curriculum helping nurses to achieve the habit of studying and reading. Ward managers considered that the educational approach had not progressed until now, although it is expected to change with the European Convergence.

In addition, ward managers considered that there should be bidirectional collaboration between the School of Nursing and the hospital. They said that they should form a team: the hospital offering the practice and the School helping more with the intellectual work and leading the research activity. This collaboration would be very important to narrow the existing research-theory-practice gap, establishing connections between the academic and practical worlds and to develop a nursing research culture in the hospital:

FG2

WM6. I think that we have to work together with...**WM7.** (Interrupts) The School (of nursing) **WM6.** The Nursing School **WM5.** ...with the School **WM8.** Yes **WM6.** ...I think that the studies should also be directed by people from the School, involved...each one in her areas or departments...

Participants held different views regarding whether this collaboration already existed. Although they considered that it had improved over recent years, they also stated that it should be better and formally established at institutional levels as, until now, most of the collaboration had been at personal levels. One of the ward managers stressed that while the hospital was always willing to collaborate with the Nursing School, this was not the case with the school that only looked after its own interest. This was mentioned referring to nursing lecturers who did data collection for their doctoral theses in the hospital.

Lack of **resources** was seen as another important barrier in the hospital to conduct research activities. This implied both material resources, such as rooms, computers or books; and economic resources. They stressed that currently it was almost impossible to get funding for nursing research and they had to be asking medical departments. Some also mentioned that they did not know how to apply for funding. Ward managers mentioned that nurses did not receive any facilities to attend courses or conferences unless they presented a paper. They considered that this was a barrier because going out and seeing what others were doing was a stimulus for nurses to do research.

The staff and **ward organization** also seemed to have an impact on the research activity. They considered that there were several issues which limited them: 1. too much workload and a complex and changing situation in the hospital; 2. more complex and more demanding patients, and a mixture of patients' specialities in the wards; 3. unpredictable shifts that difficult organization; 4. the contracts policy, the staff shortage and lack of continuity in the same ward. Regarding the organization of the wards, they also mentioned that, as every nurse had to be in charge of patients, if they left the ward to study or to go to the library, this directly had an impact on others' work:

FG1

WM1. ...because of the work organization, as each nurse is in charge of some patients, if she leaves, other gets overloaded... **WM2.** Yes, and a peer could say ok, go to the library, but other...

Finally, it was mentioned that the **visibility of research** was very important. They considered that an effort should be made in its dissemination to make people aware of research relevance, motivate other nurses to do research, give ideas, and facilitate research utilization. This dissemination could take place at international and national journals, conferences, but also within the hospital. They highlighted the benefit of the Intranet to facilitate the visibility of research in the hospital.

Summary of ward managers' findings

This section of the chapter has presented findings from questionnaires and focus groups which were essential for the design of the intervention, providing understanding about the situation and the research culture in the hospital. It is concluded that ward managers of this hospital were aware of the relevance of research for nursing profession and patient care and they had positive opinions

about it. Nevertheless, they also saw many difficulties that made its development and use in practice very complicated. They talked about the research culture of the organization and the quality of nursing research, both, key aspects to be addressed in the intervention.

In addition, the ward managers considered that they were key agents in research development in their wards and that it was part of their duties. Nevertheless, there were some differences in their views because some of them considered that they should mainly play a leadership role, while others, saw that their responsibility was more to help to enhance motivation and encourage staff to do research.

An aspect that was widely explored in the focus groups was the factors that they considered determinant for research development. Ward managers showed several barriers that the proposed intervention had to overcome. Table 3.3 summarises those barriers and the main facilitators introduced through the intervention with the objective of developing a nursing research culture in the hospital.

Table 3.3 Barriers to nursing research and intervention main facilitators

Barriers	Main facilitators introduced with the intervention
<p>Lack of time: some said that sometimes it was not real. Difficulties regarding clinical nurses' work organization/ staff shortage.</p> <p>Lack of a research culture: difficult to make nurses aware of the importance of research. For nurses and managers to work is to be with patients.</p> <p>Lack of a research program/plan.</p> <p>Lack of knowledge: ward managers and nurses</p> <p>Lack of support: from managers, doctors, nursing school, experts in research and peers.</p> <p>No research impact on practice: frustration and indifference.</p> <p>Lack of motivation: nurses motivated at the beginning but get burned-out</p> <p>Lack of resources to go to conferences and courses</p> <p>Difficulties regarding ward organization</p> <p>Lack of visibility of research results</p>	<p>Training: for nurses and ward managers</p> <p>Visibility of research and its potential impact on nursing practice: journal clubs</p> <p>Research expert support: mentors' network</p> <p>Definition of research priority areas and research programmes/plan in the different hospital wards: designed by ward managers with the help of mentors</p> <p>Support from hospital managers: facilities and resources</p>

3.1.2. Baseline results from clinical nurses

In addition to the baseline data collected from ward managers, information was obtained from clinical nurses. This information was gathered through a questionnaire survey.

At the beginning of this section, the descriptive analysis of the questionnaire will be presented to give an overview of the situation in the hospital regarding nursing research. Afterwards, bivariate analysis will be presented, where variables were compared and correlated to look at relationships between context and outcomes.

To guide this part of the analysis, Table 2.1, p.49, containing the classification of variables into contexts and outcomes, was followed: 1-Contexts were all the variables given by the situation, individual and general factors; 2-Outcomes were the research related activity, research capacity and capability; 3-By mechanisms it was meant aspects of the intervention which will be mainly directed to increase nurses' research capability, capacity and activity.

a. Descriptive analysis

a.1. Variables classified as contexts

Contexts included nurses' personal characteristics (demographics, professional and academic-research profiles) and general contexts (ward's characteristics and barriers and facilitators)

a.1.1. Nurses' personal characteristics

Demographics

In the study site the total number of nurses meeting the inclusion criteria for this study was 211 and the response rate was of 76.7% (n=162). See Table 3.4 for nurses' demographics data.

Professional profile

There was a large variation in the sample regarding the time since they obtained their nursing degree (range=31, 1074-2005), being the mean number of years 11 (SD: 7.2). Table 3.4 summarises the data gathered to establish the nurses' professional profile.

Table 3.4 Nurses' personal characteristics

Characteristics	
Demographics	
Female	100%
Age (years)	m*=32.4 (SD**: 7.47)
Married	51%
Single	49%
Professional profile	
Years of professional experience	m=11 (SD:7.17)
Years working in the University Hospital of Navarra	m=10.2 (SD:7.02)
Number of wards where they worked	m=1.80 (SD:1.15)
Type of contract	
Permanent	64% (68% full-time/ 32% part-time)
Temporary	36% (58% full-time/ 42% part-time)

*mean; **Standard deviation

Academic-research profile

Academic research profile included variables such as, postgraduate education, research training and English proficiency. Regarding nurses' postgraduate education, 94% had completed at least one speciality program of those offered in the hospital. Furthermore to the speciality program, 53% of nurses (n=86) had attended other postgraduate courses organised mainly by the hospital, and the Schools of Nursing of the two universities of Navarra. Only 3% of the sample had a masters' degree. The percentage of nurses who had attended research related courses was 13%. Most of these were short courses organised by the School of Nursing.

Regarding their English proficiency, which was measured with a four point Likert scale (none, low, medium, high), 60% of clinical nurses felt that it was 'none' or 'low'. Although, due to the increasing interest given to learning English, younger generations had higher English proficiency.

a.1.2. General context

Wards' characteristics

Seventy six percent of the sample work in general hospital wards with surgical and medical patients. The speciality areas where they worked are summarised in Table 3.5.

Table 3.5 Speciality area of work

Speciality area	Percentage (n)
Midwifery/Labour ward	3.7 (6)
General surgery	22.8 (37)
Cardiology	10.5 (17)
Internal medicine/ Oncology	14.8 (24)
Paediatrics	6.2 (10)
Orthopaedics/ Neurology	13 (21)
Oncology week hospital	5.6 (9)
Intensive care	23.5 (38)

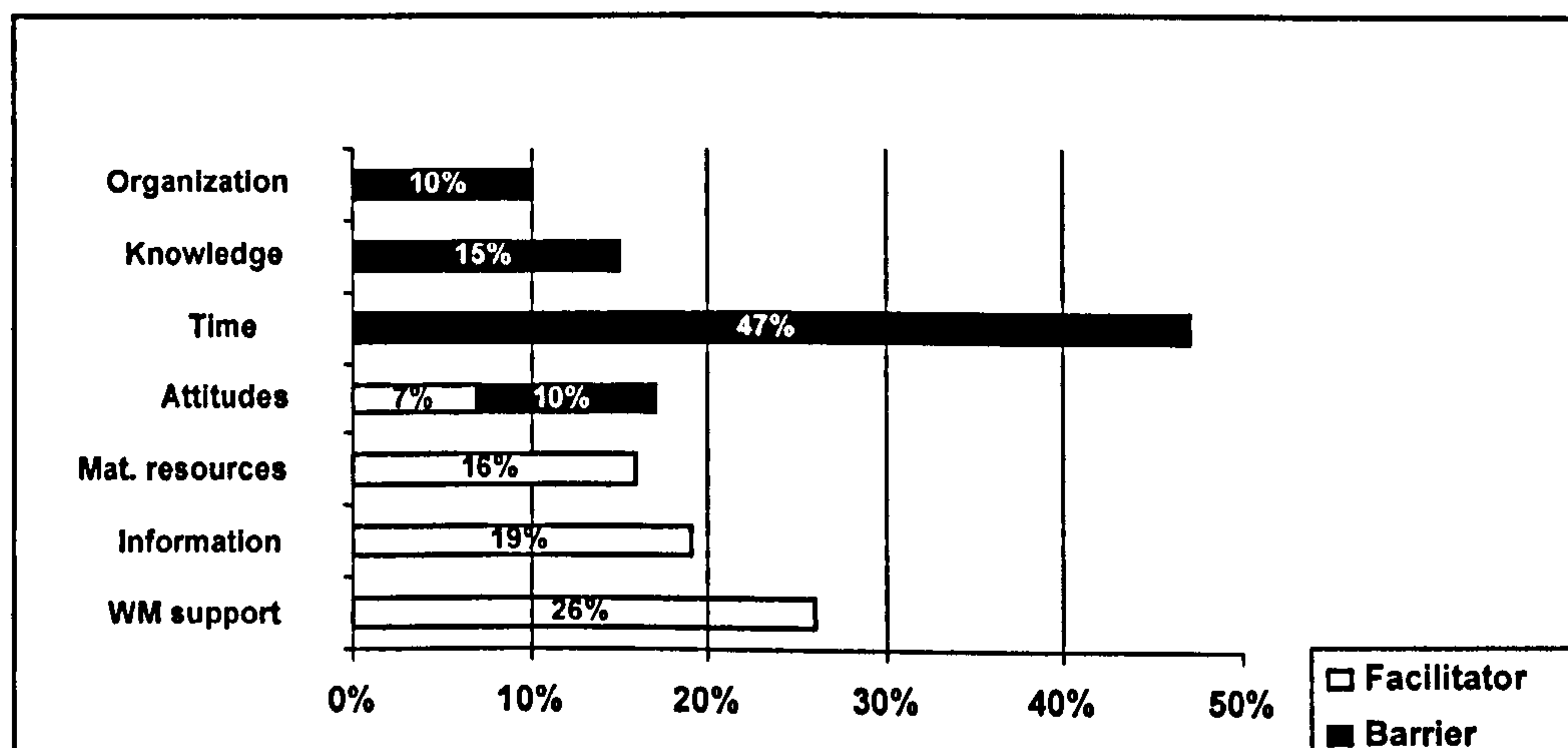
Influential factors for nursing research development

The influential factors were gathered with open-ended questions to allow nurses to identify those elements that they considered more important to conduct research studies and read research papers. The most important barriers and facilitators are given in the following section.

Facilitators and barriers to undertake research studies

The support of their ward managers was seen as the most important facilitator to do research (26%). The access to information and the availability of material resources (i.e. bibliography, library and protocols) were the most important facilitators for 19% and 16% of participants respectively. On the contrary, the most important barriers perceived by nurses were the lack of time, the lack of knowledge and their negative attitudes (i.e. lack of interest and motivation). Ten percent of nurses felt that the work organization, mainly the workload, shifts and staff shortage, was the main barrier (Figure 3.2).

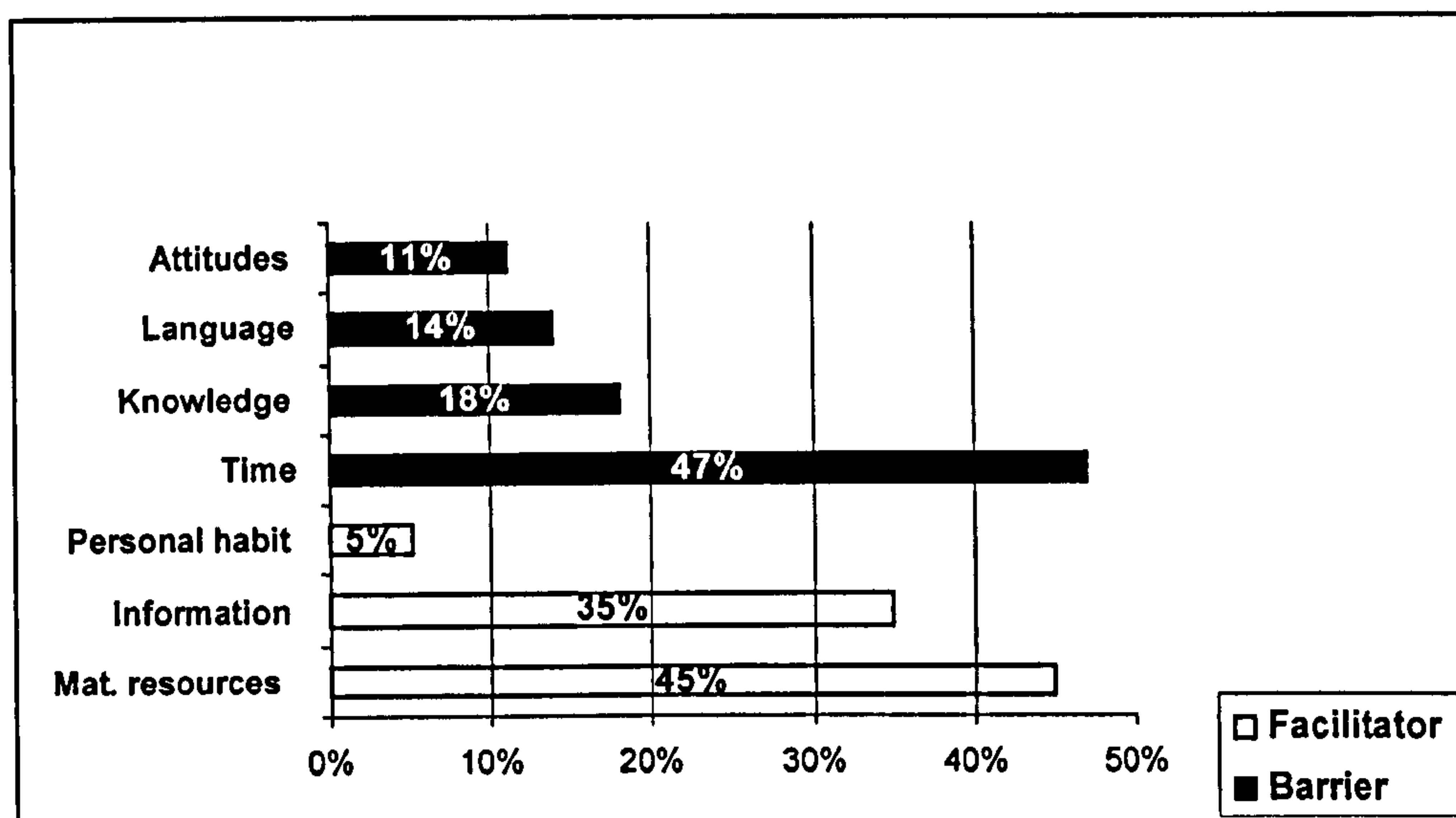
Figure 3.2 The most important facilitators and barriers to undertake research



Facilitators and barriers to use the published research

Material resources' availability (i.e. library access and bibliography) and the accessibility of information (i.e. databases, informatics and computers) were considered the principal facilitators to read. The personal habit of reading was also considered the main facilitator for some of the participants but the percentage was lower. The most important barriers were similar to those identified to undertake studies, i.e. the lack of time and knowledge, and the negative attitudes. However, in this case for some nurses the low English proficiency was the main inhibiting factor (Figure 3.3).

Figure 3.3 The most important facilitators and barriers to use research



Nurses' suggestions for developing research

Nurses were asked, through an open-ended question, about what would they change to help to develop nursing research in their wards. Ninety six nurses answered this question and results were content analysed and summarised in six themes: training, time, motivation, staffing issues, support, research areas and impact on practice.

- The three most important aspects to change were: the training (n=28/29%), time (n=29/30%) and motivation (n=26/27%):

CN*109. We have to be trained and motivated and the research activity should be integrated in our shift.

CN59. I think that none of us is motivated and we do not see the need for research. I feel that everything has been already said and to do research is to go all over the same again.

(*clinical nurse)

- Nurses (n=9/9%) also commented that they would increase the number of staff able to do research during the shift and not to overload peers when they leave the patient to study.
- Support from experts and managers of the hospital was also seen as something to change (n=5/5%). Nurses commented that they needed to have facilities and incentives to do research.
- Finally, nurses (n=5/5%) stressed that if they did research about interesting topics that had an impact on practice, this would increase their motivation:

CN148. ...when I started I was willing to participate in research activities but topics were decided by managers and I did not like this. We collected data but these were not useful at all. Nothing changed in practice.

a.2. Variables classified as outcomes

The nurses' research capability and activity were defined as the study outcomes because the aim of the intervention was to increase them in the hospital.

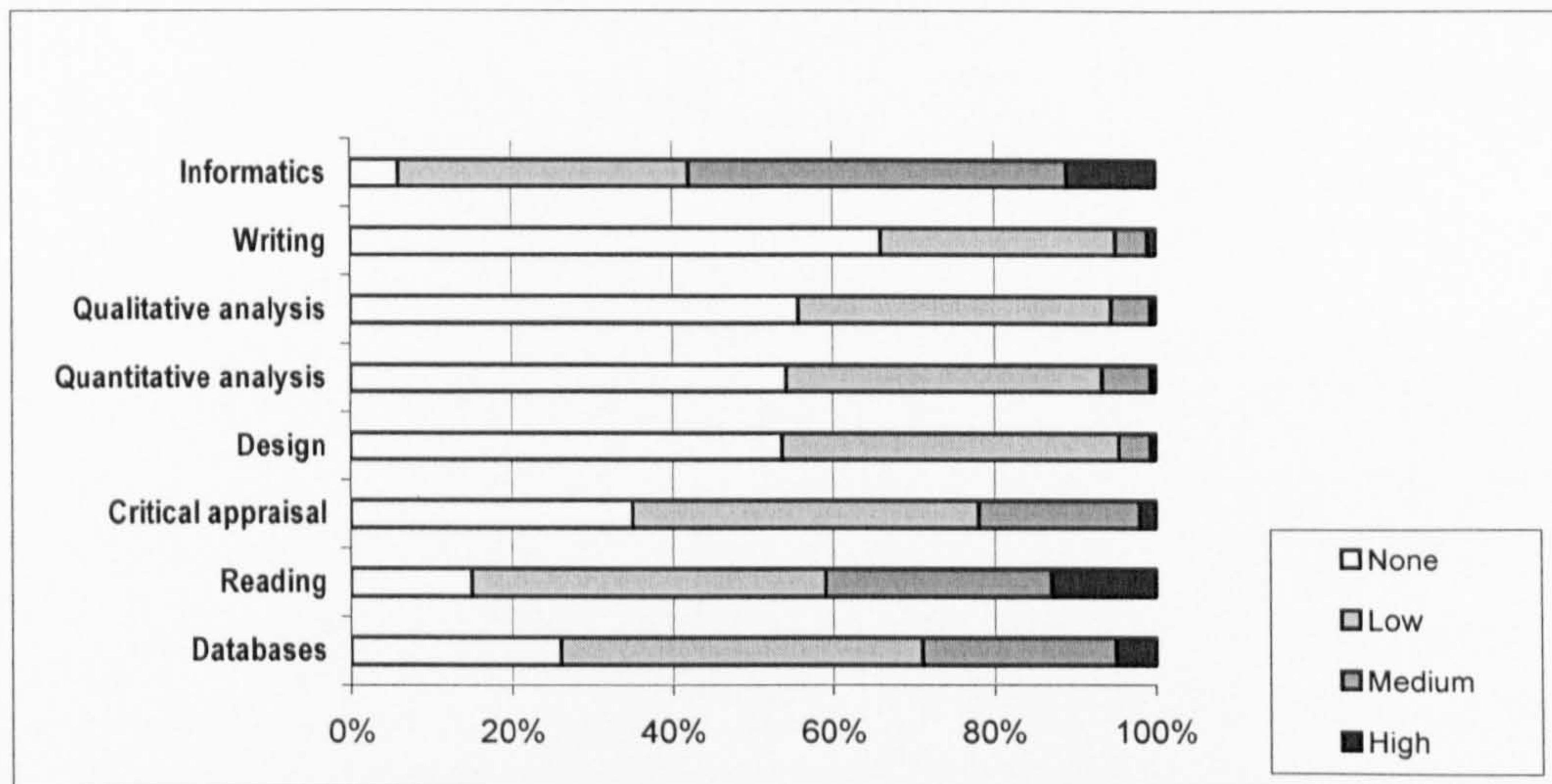
a.2.1. Nurses' research capability

The nurses' research capability included variables such as research skills and knowledge, interest, and attitudes.

Research skills and knowledge

The research skills of nurses were measured with a four point Likert scale (none, low, medium, high) of nine items covering different research areas such as, database searches, critical appraisal of the literature, data analysis and study design. The central tendency values showed that for clinical nurses the mean level of knowledge was 14.91 (SD: 4.36), which means that the overall knowledge falls between 'none' and 'low'. The highest rated area of knowledge was the use of informatics with 47% of clinical nurses considering their proficiency as 'medium', and the lowest were study design, data analysis and writing reports (Figure 3.4).

Figure 3.4 Clinical nurses' research skills



When nurses were asked about their general research knowledge (none, low, medium or high) the answers were congruent with the previous data. Ninety two percent of them said that they had 'none' or 'low' research knowledge (Table 3.6).

Table 3.6 Clinical nurses' research knowledge

Level of knowledge	Percentage (n)
None	32.1 (n=52)
Low	59.9 (n=97)
Medium	7.4 (n=12)
High	0.6 (n=1)

Research interest

The majority of the sample, 86% (n=136) stated that they would like to receive more preparation in nursing research. They were asked, through an open-ended question, about the kind of preparation that they would like to receive and 52% answered the question. Forty percent of those who replied said that they needed preparation in all the research areas: 'I need knowledge in all the research areas/fields', 'in general', 'about how to develop a study'; and 26% about their speciality working area. The rest of the answers were more specific: in literature review issues (13%) (databases search, critical appraisal and reading), in methodology (11%), and in data collection and analysis (10%).

When nurses were asked about whether they would like to participate in nursing research projects, the percentage of interested people decreased to 75% (Fisher exact p value <0.01). Thus, it seemed that not all the nurses interested in gaining more research knowledge wanted to conduct research studies.

Nurses' attitudes towards research

Nurses' attitudes towards research were measured with a 19 item Likert scale (five options from 'totally agree' to 'totally disagree'). This scale was designed from the literature review and its internal consistency was calculated using Cronbach's alpha, $\alpha=0.73$. Exploratory factor analysis was conducted, with principal components analysis as the method of factor extraction, to identify the underlying factor structure of the scale. The Kaiser-Meyer-Olkin coefficient was 0.656 and the Bartlett test of sphericity was statistically significant (χ^2 653.96; $df=171$, $p<0.01$) indicating that properties of the correlation matrix justified factor analysis to be carried out. Sample size was also considered as adequate as the variable to subject ratio was 1:8.5. Oblique factor rotation identified three latent factors. The extraction was based on scree plot visual interpretation (Figure 3.5) and Kaiser's criterion for Eigenvalues of equal to or greater than unity. Moreover, the Monte Carlo PCA for Parallel Analysis test was done and results supported the extraction of three factors. The three factors identified, comprising 17 of the original 19 items, explained 41.41% of the total variance. Two items were removed because they had low loading factors, 0.212 and 0.240 respectively. Factor 1 was called 'research relevance', it included 8 items and explained 20.5% of the total variance (Eigenvalue of 3.48). Factor 2, with 6 items, was labelled 'value of research for nurses' and explained 12.5% of the total variance (Eigenvalue of 2.11). Factor 3 was labelled 'nurses' characteristics' and explained 8.4% of the total variance with three items (Eigenvalue 1.44). Table 3.7 illustrates the final solution of factor analysis conducted with the 17 remaining items.

Figure 3.5 Scree plot

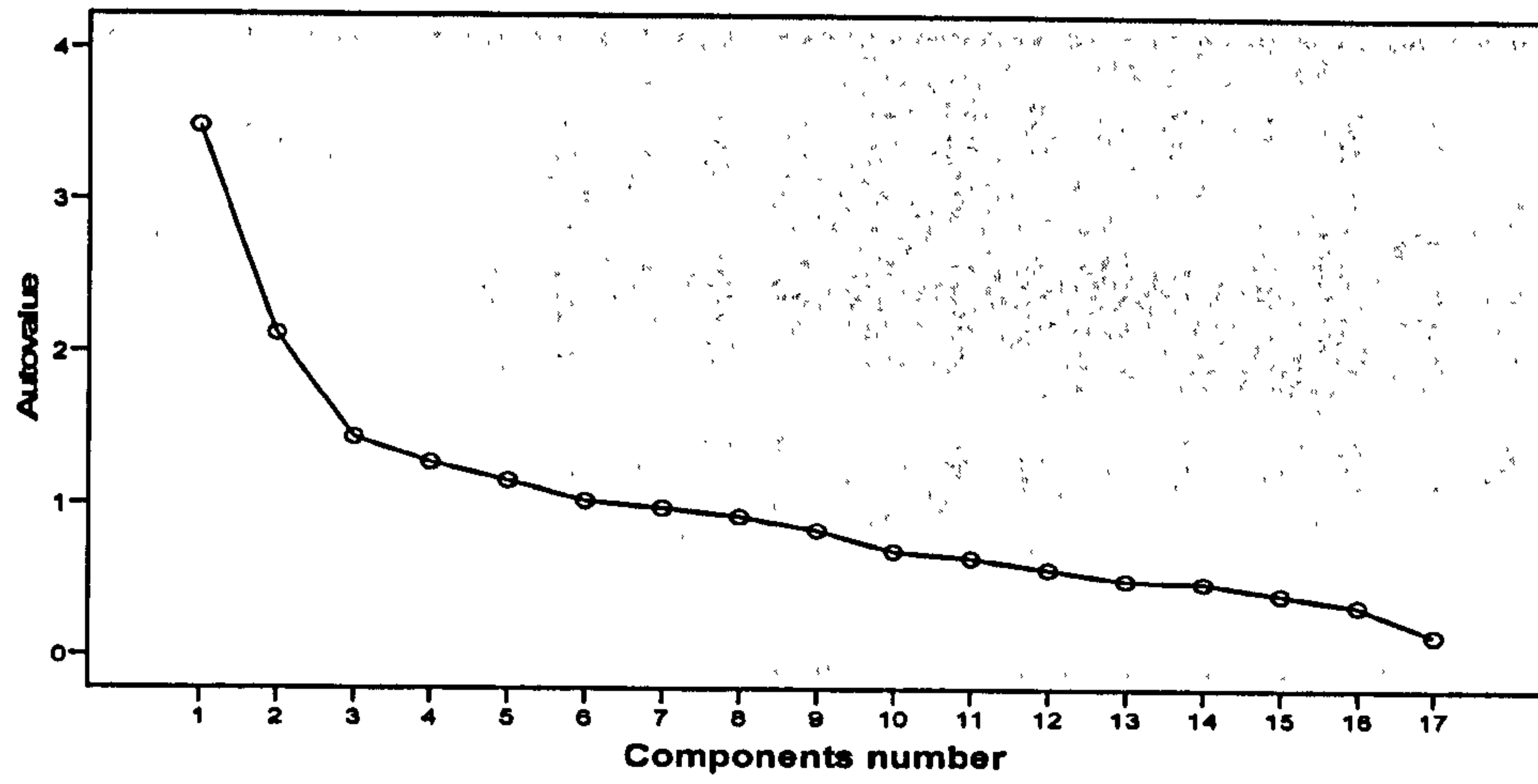


Table 3.7 Attitudes towards research scale: Factors, items and factor loading

Factors	Items	FACTOR LOADING		
		1	2	3
Factor 1. Research relevance	1. Research is only relevant to nurse education, not to nurse practice	0.688	-0.280	0.098
	2. Research is a specialist activity that is relevant to only a few nurses working in the clinical areas	0.681	-0.341	0.099
	3. Nursing research complicates the daily nursing work	0.579	-0.135	-0.267
	4. We do not need any researchers in nursing to develop the care	0.537	-0.199	0.168
	5. Nurses are too busy delivering care to spend time reading research	0.522	0.129	-0.052
	6. Nurses are not in need of knowledge based on research as much as doctors	0.478	-0.387	0.062
	7. Most nurses don't have any motivation to carry out research	0.436	0.126	0.179
	8. I find that most reports of research in nursing are too complex to understand	0.370	-0.106	0.107
Factor 2. Value of research for nurses	9. I think that nursing research is important	0.089	-0.862	-0.032
	10. I think that nursing research is interesting	0.043	-0.841	-0.026
	11. I would do research if I would have time to do so	0.306	-0.575	-0.095
	12. I value when some of my peers do research work in nursing	0.104	-0.492	0.077
	13. An essential role of nurses is to carry out research	0.180	-0.487	-0.362
	14. Nursing should become a research based profession	0.313	-0.393	-0.286
Factor 3. Nurses' characteristics	15. Most nurses are competent to undertake research	0.168	-0.086	0.686
	16. Most clinical nurses are not interested in implementing research findings	0.430	-0.098	0.666
	17. Most nurses are aware of relevant research findings	0.006	0.083	0.611
	Cronbach's alpha	0.649	0.699	0.536

Nurses were given the opportunity to add comments regarding their opinions about nursing research. Thirty five answered to this question and sixteen of them considered that nursing research was essential for the profession and important for practice:

CN18. I think that nursing research is very important because it will allow us to improve our practice and generate new knowledge.

Some of the nurses' comments (n=4) referred to the fact that research was a neglected area and in the hospital, managers did not value it.

Other nurses (n=5) stressed that they preferred caring for the patient than studying, they thought that the daily work and the research activity were not easy to combine and that not every nurse had to do research:

CN30. I think that it is important but not for every one! There should be nurses for teaching, others for caring for patients and others for doing research...

Others' opinions about research (n=2) depended on the topics and its impact on practice.

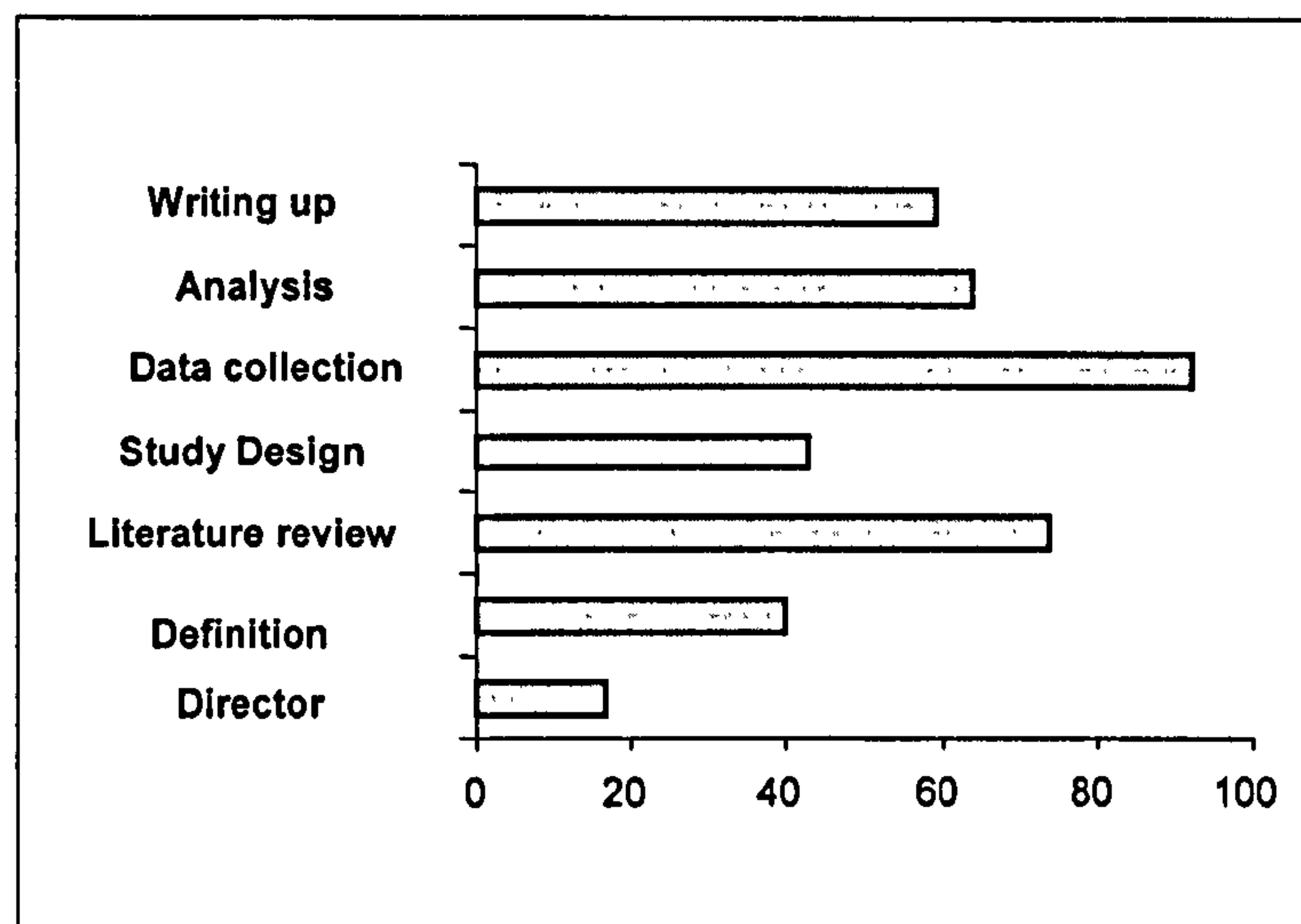
CN124. ...depending on the topic it is interesting or not for clinical nursing. Sometimes, we participate in research projects that do not contribute to nursing practice development at all!

a.2.2. Research related activity

This concept included research activities such as, conducting research studies, reading research, using research results in practice or participating in research diffusion activities.

Fifty nine percent of nurses had participated in research studies (mean: 1.75; SD: 1.1), mainly in nursing research studies (86%). Only 9% took part in medical research studies and 17% in multidisciplinary research. The majority were descriptive studies (63%) and 19% stated that they did not know the design of the study. The role they played more often in the studies was collecting data (92%) (Figure 3.6).

Figure 3.6 Nurses' role in research studies



Sixty one percent of nurses considered that the experience of doing research was positive. Nevertheless, 30% stated that it was 'neither good not bad' and the rest felt that it was a 'bad' or a 'very bad' experience (Table 3.8).

Table 3.8 How would you describe the experience?

Level of knowledge	Percentage (n)
Very good	16 (15)
Good	45.7 (43)
Neither good not bad	30.9 (29)
Bad	5.3 (5)
Very bad	2.1 (2)

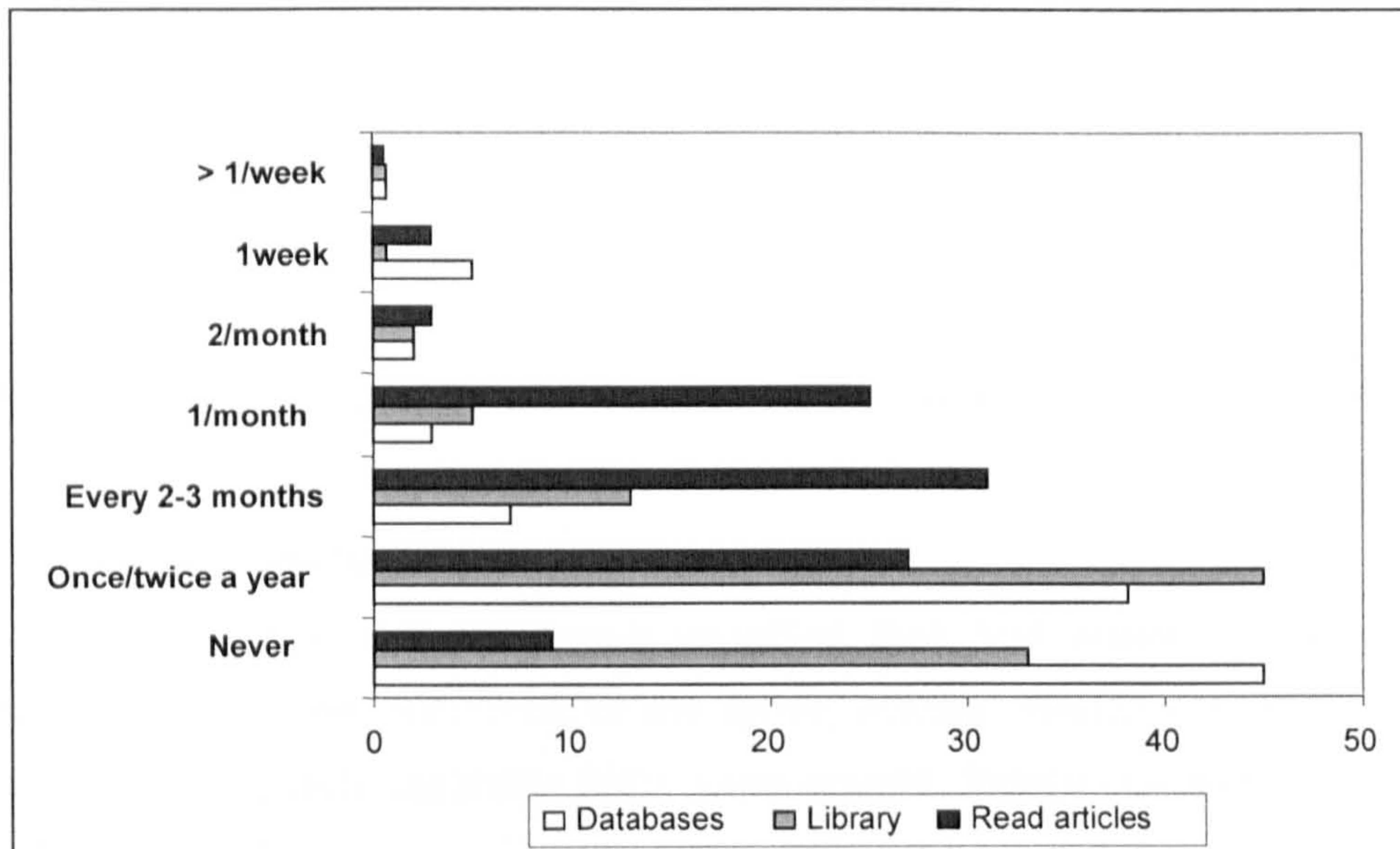
Nurses were asked, through an open-ended question, about the reasons for this and the content analysis of the answers gave the following results that appear summarised in Table 3.9.

Table 3.9 The experience of participating in research studies

Positive experience	Neither good not bad/negative experience
Learning experience about research and about how to care for patients (n=16)	No knowledge (n=14)
Research helps in the daily practice when applying the results. Reflexive practice (n=14)	No impact in practice (n=9)
Gratifying, important to know other aspects of the profession. Open your mind (n=10)	No time to do and enjoy it (n=8)
Interesting the topic and the study (n=12)	Lack of coordination and support (n=7)
Motivating (n=10)	Too much effort (n=6)
Nurses' comments: <i>CN130 I learnt a lot participating in the study and applying results in practice. It helps to understand and reflect on the daily practice.</i>	The project was not understood (n=5)
<i>CN78. It helps as an stimulus for your work because you read and learn about the way in which they do things in other places, keeps you up to date and it is helpful to design protocols to care for patients</i>	No continuity afterwards (n=5)
	No interesting topic (n=3)
	Nurses' comments: <i>CN120 It was during the speciality course and the study did not motivate me at all we found many difficulties and did not achieve any conclusions. I had a great deficit of knowledge.</i>
	<i>CN59. It was not gratifying at all! The topic was not decided by us and results did not contribute to practice because there were things already introduced</i>

In addition to this, the use of material resources (library, databases and articles), was measured in the questionnaire. It was assessed by a question with three items in a Likert scale of seven points (i.e. never, once/twice per year, every 2-3 month). The most frequent answer in two of the three items was 'never' and 'once/twice per year', 83% for databases use and 78% for the use of the library respectively (Figure 3.7).

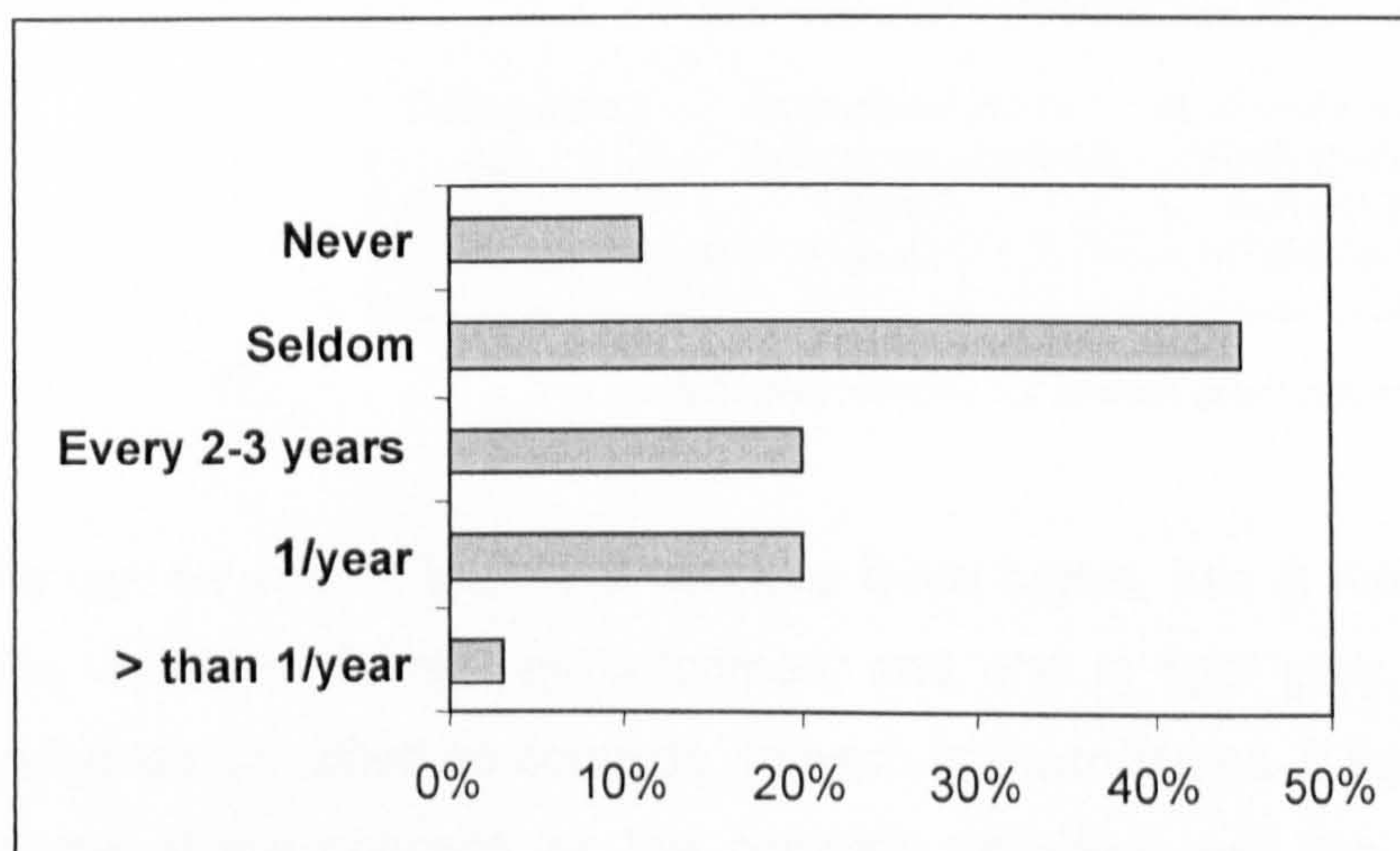
Figure 3.7 Nurses' use of material resources



The majority of clinical nurses, 61.5%, stated that they did not subscribe to professional nursing journals. Many of them said that they had been subscribed but now they were not due to a lack of time to read or because they could have electronic access to them, this being cheaper and more convenient.

Regarding the use of research in practice (never, seldom, sometimes, frequently or all the time), the mean was 2.39, SD:1.0 and most of the responses fell between 'never' and 'sometimes'. When they were asked about the attendance to nursing conferences, the most frequent answer was 'seldom' (45%) (Figure 3.8).

Figure 3.8 Attendance to nursing conferences



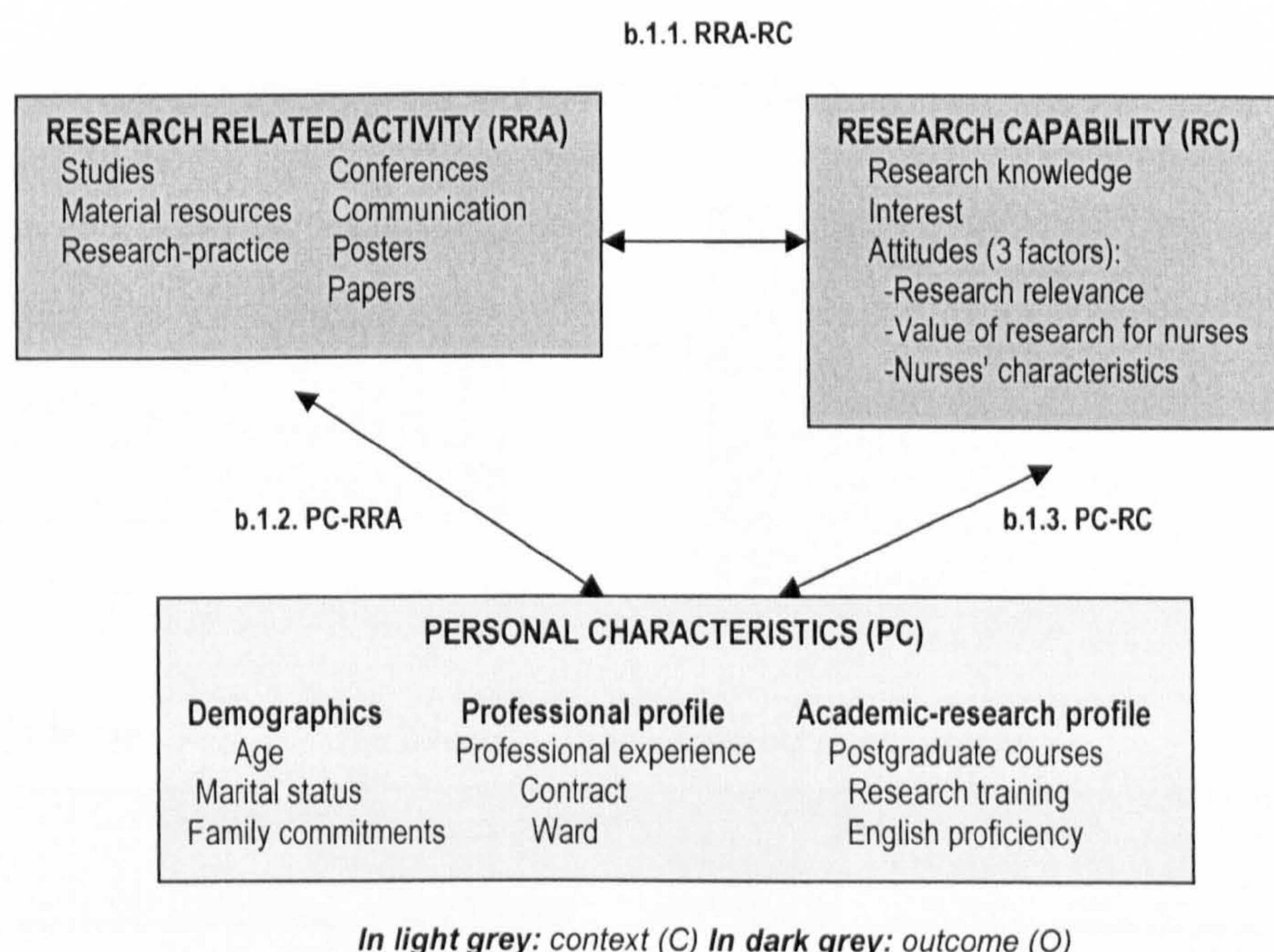
Looking at nurses' participation in research diffusion activities, it was noticed that the most frequent was presenting oral communications. Fifty two percent of nurses had done it (mean: 2.16; SD: 1.3). This was followed by 30% of clinical nurses who had published a paper (mean: 1.74; SD: 1.17). The least common activity was the presentation of posters to conferences (23%).

b. Relationships between main variables

b.1. Bivariate analysis

In this part of the analysis, those variables that had statistically significant relationships with the outcomes of the study, nurses' 'research related activity (RRA)' and 'research capability (RC)' were sought. Figure 3.9 summarises the variables studied.

Figure 3.9 Variables included in the bivariate analysis



As can be seen, Figure 3.9 contains three boxes, two in dark grey, representing the variables defined as outcomes, and one in light grey, which includes the variables classified as contexts. In each of these boxes, it appears, in capital, the name of the concept (or the complex variable), and the variables that were included in that concept. This section of the analysis will be divided in three parts:

- b.1.1. RRA and RC: relationships between research related activity and research capability.
- b.1.2. PC and RRA: relationships between personal characteristics and research related activity.
- b.1.3. PC and RC: relationships between personal characteristics and research capability.

Each of these parts of the analysis will be explained separately, and in detail, in the following sections of this chapter.

b.1.1. Research related activity and research capability

This section presents the comparisons between RRA and RC to determine whether there were relationships between the study outcomes. In Figure 3.10, the variables included under the terms RRA and RC are detailed, and Tables 3.10a and 3.10b summarise the statistical differences (Table 3.10a presents differences between groups and Table 3.10b relationships between variables).

Figure 3.10 Research related activity and research capability

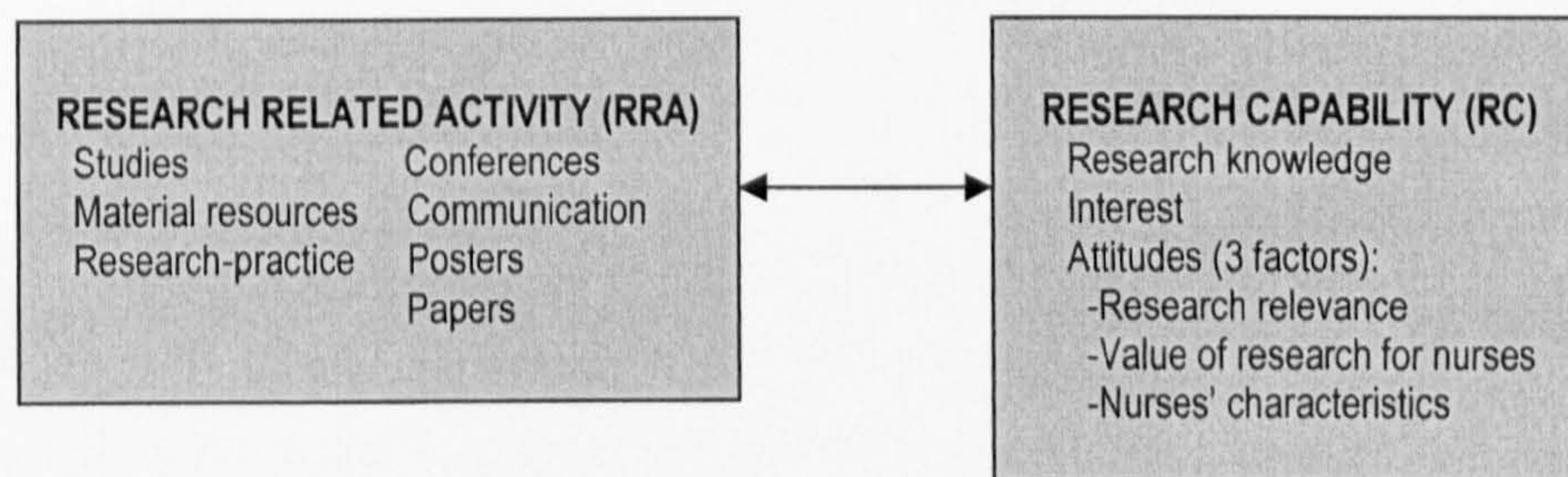


Table 3.10a RC and RRA statistical results. Differences between groups

RRA	RC					
	Knowledge	Interest in training	Interest to participate	Research relevance	Value of research	Nurses' characteristics
Studies	**					
Material resources		+	**			
Research in practice		+	*			
Conferences	**	*			*	
Communications						**
Posters	*				+	
Publications	**	+	**	+	*	

+ indicates differences almost statistically significant (p values between 0.05 and 0.1)

* indicates statistically significant differences ($p \leq 0.05$)

** indicates statistically significant differences when $p \leq 0.01$

Lined area: relationships between variables in Table 3.10b

Table 3.10b RC and RRA statistical results. Relationships between variables

RRA	RC		
	Knowledge	Research relevance	Value of research
Material resources	**	**	*
Research in practice	**	**	**

* indicates statistically significant relationships ($p \leq 0.05$)

** indicates statistically significant relationships when $p \leq 0.01$

Regarding the relationships between **nurses' participation in research studies** and RC (knowledge, interest and attitudes), results indicated that the mean of research knowledge was statistically higher ($t=2.6$; $p=0.01$) in those nurses who had participated in research studies, or *vice versa*, nurses with more knowledge participated more in research studies. As the differences of means were not big, the effect size was calculated and a value of 0.42 was obtained, which indicates a medium effect size.

Looking at the **use of material resources**, results showed that this was related to all the variables grouped in RC. The research knowledge was positively correlated with the use of material resources ($r=0.529$; $p<0.001$), which indicates that nurses with more knowledge tended to use more the material resources or *vice versa*. Moreover, the interest of nurses in more preparation and in participating in studies also had significant relationships with the use of material resources, being more frequent in interested nurses ($t=1.855$; $p=0.066$ and $t=3.024$; $p<0.01$, respectively). Regarding nurses' attitudes towards research, significant correlations were found between the use of material resources and the factors 'research relevance' and 'value of research for nurses' ($r=-0.272$; $p=0.001$ and $r=-0.180$; $p=0.029$ respectively) which means that when nurses had more positive attitudes they tended to use more the available material resources or *vice versa*.

The **use of research in practice** was related to most RC variables. It was moderately correlated with the research knowledge ($r=0.274$; $p<0.001$). This means that those nurses with more research knowledge tend to use more the research findings in their practice or *vice versa*. The use of research in practice was also related to nurses' interest and attitudes. Nurses interested in more research training and in participating in studies used research findings significantly more in their practice ($t=1.841$; $p=0.068$ and $t=2.181$; $p=0.03$, respectively) with an effect size of 0.427. Two of the factors identified in the attitude scale 'research relevance' and 'value of research for nurses', were

negatively correlated ($r=-0.298$; $p<0.001$ and $r=-0.276$; $p=0.001$), which means that nurses with more positive attitudes towards research use more the research findings in practice or *vice versa*.

The variable **attending conferences** was also related to many of the variables grouped into RC. The participation in conferences was higher in nurses with more research knowledge (Fisher p values <0.01), with interest in more research training (mid- $p=0.021$) and with positive attitudes towards research (factor 'value of research for nurses') ($F=3.277$; 0.013), or *vice versa*.

Regarding **research diffusion activities** (i.e. presenting communications, posters and publishing), research knowledge was significantly higher in nurses who had participated in diffusion activities like presenting posters (mid- $p=0.03$) and publishing papers ($t=3.19$; $p<0.01$ -effect size: 0.53). On the other hand, the interest of nurses did not have significant relationships with their participation in research diffusion activities but in publishing papers, being the interest higher in nurses with publications, or *vice versa*. The factors 'value of research for nurses' and 'research relevance' were statistically related to publications ($t=-2.49$; $p=0.014$ and $t=-1.767$; $p=0.079$ respectively) which means that those nurses with publications have more positive attitudes towards research or *vice versa*.

b.1.2. Personal characteristics and research related activity

In Figure 3.11 the variables included in PC and RRA, and studied for statistical significant relationships, are summarised and the results are shown in Table 3.11a,b (Table 3.11a presents differences between groups and Table 3.11b relationships between variables).

Figure 3.11 Personal characteristics and research related activity

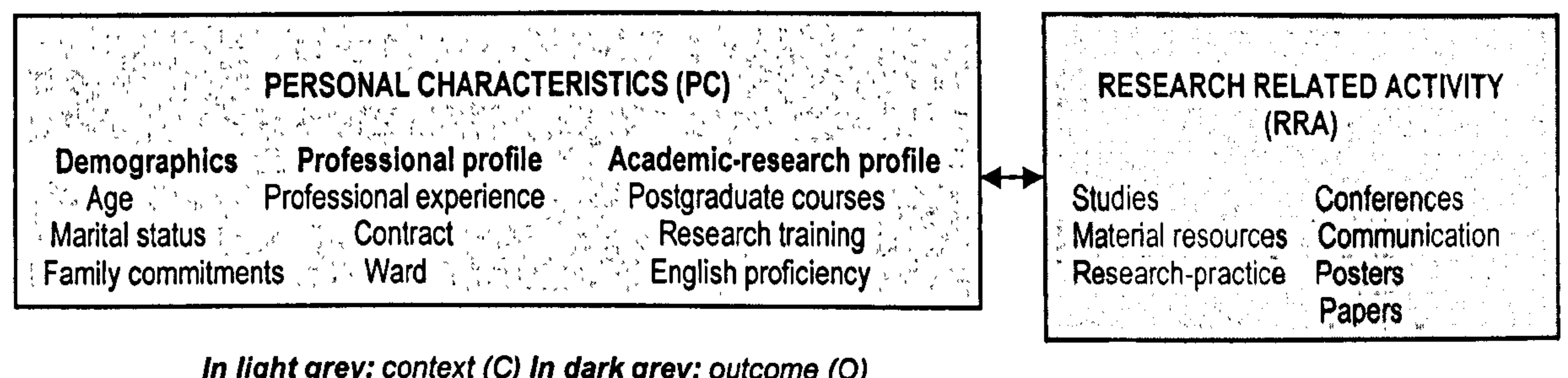


Table 3.11a PC and RRA statistical results. Differences between groups

PC	RRA					
	Studies	Material resources	Research-practice	Conferences	Communications	Posters Publications
Age					**	+
Marital Status					*	
Children					**	
Family commitments						
Years of exp.				*	**	+
Contract		*	*	*	**	*
Ward	*	*	**		**	* **
Academic Profile						
Research training	**	*	*	**	*	**
English proficiency		**		*	**	+

+ indicates differences almost statistically significant (p values between 0.05 and 0.1)

* Indicates statistically significant differences ($p \leq 0.05$)

** indicates statistically significant differences when $p \leq 0.01$

Lined area: relationships between variables in Table 3.11b

Table 3.11b PC and RRA statistical results. Relationships between variables

PC	RRA	
	Material resources	Research-practice
Age	*	+
Years of exp.	+	*

+ indicates differences almost statistically significant (p values between 0.05 and 0.1)

* indicates statistically significant relationships ($p \leq 0.05$)

As shown in Tables 3.11a,b, most RRA variables were related to the variables called professional and academic-research profiles. Results indicated that the only research-related activities that had statistically significant relationships with nurses' demographic data were: the use of material resources and the presentation of communications and posters.

The participation in research studies was higher in intensive care units ($\chi^2=5.98$; $p=0.01$). Moreover, statistical results indicated that nurses with research training had more experience conducting research studies (86%) than those without training (55%) ($\chi^2 6.99$; $p < 0.01$).

The use of material resources was negatively correlated (low correlation) with nurses' age ($r=-0.164$; $p=0.04$), which means that young nurses use the available material resources more. In addition, the professional profile (the ward where they work and their contract) was a variable clearly related with the use of material resources. Nurses' employment situation was determinant as there were

significant differences between the kind of contract and the use of material resources ($F=3.2$; $p=0.025$), Bonferroni post-hoc tests showed that nurses working with temporary full-time contracts use material resources significantly more frequently than nurses with permanent part-time contracts. The general context (the ward) seemed to play an important role in nurses' use of material resources, when the sample was divided into nurses working in intensive care units and nurses working in the hospitalization wards, t-student tests showed that the differences were statistically significant ($p=0.039$) with an effect size of 0.27, thus, nurses working in intensive care units use more the available material resources. Moreover, the research training and English proficiency seemed to have an impact on the use of material resources (Twelch 2.695; $p=0.013$), being higher for those with some training, effect size 0.77, and with higher English proficiency, or *vice versa*.

Regarding the **use of research in practice**, nurses' age and years of professional experience had a slight positive correlation ($r=0.147$, $p=0.068$; $r=0.176$; $p=0.028$), which means that older and more experienced nurses tend to use more research in their daily practice. In addition to this, it was noticed that those nurses with research training used more research findings in their daily practice ($t=2.07$; $p=0.04$), effect size of 0.47. The relationship between the ward and the use of research in practice was statistically significant ($F=4.26$; $p<0.001$), nurses working in intensive care used more the research findings than the others.

Professional and academic-research profiles were statistically related to the variable **attending conferences**. Nurses with full-time contracts go more often than those with part-time contracts (mid- $p=0.02$) and those with permanent contracts also tend to participate more in conferences, although the significance of these differences were in the limit (mid- $p=0.10$). Moreover, nurses with more professional experience go more often to conferences. The research training and English proficiency were also important being higher the participation in conferences in nurses with research training (Fisher p values <0.01) and with higher English proficiency ($\chi^2=32.529$; $p=0.038$).

Regarding **research diffusion activities** and the professional profile, it was noticed that the percentage of nurses who had presented a communication (84 out of 162 nurses) or published a paper (49 out of 162 nurses) was higher in nurses with permanent contracts (communications: $\chi^2=30.37$; $p<0.001$ and

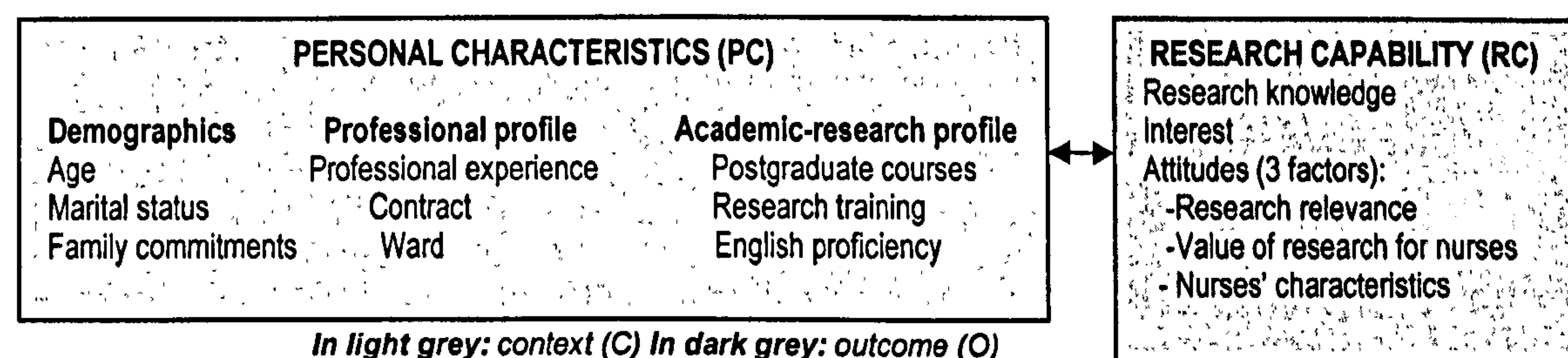
posters: $\chi^2=9.42$; $p=0.024$ respectively). The number of years of experience was also related, with experienced nurses participating more often in diffusion activities ($t=7.246$; $p<0.001$ and $t=0.182$; $p=0.073$). Moreover, the ward (intensive care unit versus other hospital wards) was also determinant, nurses working in intensive care participated more in diffusion activities (communications: $\chi^2=13.95$, $p<0.001$; publications: $\chi^2=29.00$, $p<0.001$). Although, in the case of presenting posters it was the opposite (posters: $\chi^2=4.71$; $p=0.03$). The research training was related to some of the research diffusion activities, being the percentages of nurses that had presented a communication or published a paper significantly higher in those with research training ($\chi^2=5.44$; $p=0.02$ and $\chi^2=18.94$; $p<0.001$ respectively). The English proficiency was also related to the presentation of communications (mid- $p=0.067$) and in the limit with the presentation of posters (mid- $p=0.0613$).

The demographics were related to the presentation of communications and posters. The age of nurses who had participated in these diffusion activities was higher ($t=151.4$; $p<0.001$ and $t=1.9$; $p=0.06$). The percentages of nurses married and with children who had ever prepared a communication was higher than those of single and without children ($\chi^2=6.34$, $p=0.01$; $\chi^2=12.07$; $p=0.001$ respectively).

b.1.3. Personal characteristics and research capability

The variables grouped as RC (knowledge, interest and attitudes) were studied for statistically significant relationships with PC. Figure 3.12 illustrates the relationships studied.

Figure 3.12 Personal characteristics and research capability



Research knowledge was significantly related to nurses' demographic data. The age was negatively correlated with knowledge ($r=-0.316$; $p<0.001$ (moderate correlation)), thus, younger nurses have more knowledge. There were also statistically significant relationships between nurses' demographic data and their

interest and attitudes (factor 'research relevance'). The interest in research training, in participating in research projects and the attitudes towards research were significantly higher in young, single and without children nurses (Table 3.12 for tests performed and statistical results).

Table 3.12 Tests and statistical results for RC and PC variables

PC	RC		
	Interest in training	Interest to participate in projects	Attitudes Factor 1
Age	t=-2.129 df:155 p=0.035	t=-3.257 df:152 p=0.001	r=0.384 p>0.001
Marital status	χ^2 4.998 df: 1 p=0.025	χ^2 17.54 df:2 P<0.001	t=-3.836 df:151 p<0.001
Children	χ^2 4.175 df:1 p=0.041	χ^2 13.66 df:2 P<0.001	t=2.966 df:151 p=0.004

Regarding the relationships between professional profile and RC, the professional experience was related to knowledge, interest and attitudes. Nurses' knowledge was negatively correlated with their professional experience ($r=-0.31$; $p<0.001$ (moderate correlation)), which means that those nurses with less professional experience seem to have more knowledge about research. Regarding nurses' interest in more training and in participating in studies, results indicated that more experienced staff seem to be less interested ($t=-2.23$; $p=0.02$ and $t=3.5$; $p<0.001$ respectively). The employment situation was also related to nurses' research knowledge and interest, being both higher in nurses working with temporary contracts ($F=5.23$; $p<0.01$ and $\chi^2=15.25$; $p<0.01$ respectively).

The area where nurses worked, divided into intensive care units and hospital wards, had statistically significant relationships with nurses' knowledge, attitudes and interest in participating in research studies. Nurses working in intensive care units had more research training and knowledge, were more interested and hold more positive attitudes towards research (factor 'research relevance') (Table 3.13 for tests and statistical results).

The academic-research profile was related to some of the RC variables. For instance, research training and knowledge, which relationship increased the tool's criterion validity ($T_{welch}=2.55$; $p=0.018$). The English proficiency was also related to nurses' research attitudes, knowledge and interest in participating in studies (Table 3.13 for tests and statistical results).

Table 3.13 Tests and statistical results for PC and RC

PC	RC				
	Research training	Knowledge	Interest to participate	Attitudes Factor 1	Attitudes Factor 2
Ward	$\chi^2 2.880$ df:1 p=0.09	t=-2.2 df:1 p=0.026	$\chi^2 5.33$ df:1 p=0.021	t=3.184 df:152 p=0.002	t=1.248 df:156 p=0.218
English proficiency	$\chi^2 13.994$ df:3 p=0.0257	F=20.431 df:3 P<0.001	$\chi^2 6.976$ df:3 p=0.0787	F:4.531 df:3 P= 0.005	F:3.719 df:3 P= 0.013

b.1.4. Relationships within research capability variables

Those nurses interested in more research training and in participating in research studies were those with higher research knowledge and with more positive attitudes. Besides, nurses interested in more training tend to be also interested in participating in research studies or *vice versa* ($\chi^2=81.289$; $p<0.001$). The same happened with attitudes, factors 'research relevance' and 'value of research for nurses', being both negatively correlated (moderate correlation), with nurses' knowledge (Pearson $r=-0.309$; $p<0.001$ and $r=-0.396$; $p<0.001$ respectively) which means that those nurses with more knowledge hold more positive attitudes towards research or *vice versa*.

b.2. Multivariate analysis

b.2.1. Linear regression model for research related activity

The bivariate analysis allowed us to determine the statistically significant variables related to one of the principal outcomes: nurses' research related activity. The following step was to do a linear regression model with the independent variables to determine their influence in the dependent variable, research related activity. The variables related to research activity with a p value <0.1 were introduced in the model to determine the most important predictors for nurses to participate in different research activities.

Multiple regression is a multivariate statistical technique for determining the simultaneous effect of two or more independent variables on a dependent variable and determine the most important predictors for it (Polit and Beck 2008; Cormack 2000). In this study, the dependent variable was nurses' research related activity. This sums up the different research activities measured in the questionnaire: number of studies, frequency of use of material resources, frequency of use of research in practice, and number of communications, posters

and publications. The independent variables introduced into the model were: research knowledge, ward, research training, English proficiency, attitudes towards research (the three factors obtained in the factor analysis), interest and ward managers' support. Following the classification of variables into contexts, mechanisms and outcomes, the independent variables are:

- Context: research training and English proficiency; ward, ward managers' support.
- Outcomes: research knowledge, attitudes and interest.

Regarding the contexts, the research training was a dichotomous variable asking whether nurses had received some kind of research training. The English proficiency and the ward manager's support were introduced as dummies. The ward where they worked was divided into hospital wards and intensive care units.

The other variables introduced (outcomes) were research knowledge, attitudes towards research and interest. The research knowledge was measured with a nine item Likert scale asking about different skills. Attitudes were measured with three subscales (obtained with factor analysis): 'research relevance'; 'value of research for nurses' and 'nurses' characteristics'. Table 3.14 summarises the variables introduced in the model.

Table 3.14 Variables in the model to determine research related activity

Contexts

Ward: Intensive care and hospital wards

Research training: Have you done any research course? 1-yes, 2-no

English proficiency: 1-none, 2-low, 3-medium-high. Reference value for dummies: none

My ward manager supports me to do research: 1-strongly agree/agree (yes), 2-undecided, 3-disagree/strongly disagree (no). Reference value for dummies: strongly agree/agree

Outcomes

Research knowledge: 9 items Likert scale with 4 options

Attitudes towards research (Factors: 'research relevance', 'value of research for nurses' and 'nurses' characteristics'): 5 options Likert scale

Interest: Would you like more research preparation and to participate in research studies?

The model, shown in Table 3.15, explains 47% of the variance of nurses' participation in research activities ($R^2=0.468$). This means that the variables introduced into the model are quite strong predictors of the dependent variable.

Table 3.15 Multiple regression results

Variable	β	p	CI (95%)
Research knowledge	0.536	<0.0001	0.287, 0.785
Research training	3.822	0.005	1.161, 6.483
Ward	2.955	0.013	0.631, 5.279
Attitudes towards research total	-0.536	0.204	-1.451, -0.313
Factor 'nurses' characteristics'	1.004	0.071	-0.089, 2.097
Factor 'value of research for nurses'	0.242	0.617	-0.716, 1.201
Factor 'research relevance'	0.510	0.297	-0.455, 1.475
English proficiency			
d1: none-low	-0.254	0.855	-3.003, 2.495
d2: none-medium/high	0.256	0.865	-2.728, 3.241
Interest			
In preparation	1.143	0.523	-2.393, 4.679
In participation	-2.357	0.131	-5.426, 0.713
Ward managers' support			
d1: yes-undecided	0.242	0.892	-3.285, 3.769
d2: yes-no	0.377	0.819	-2.875, 3.628

(F (13,111)=7.523, p<0.001) β =regression coefficient. CI= confidence interval

Variables such as the English proficiency, the interest, the ward managers' support and some of the attitudinal factors were no longer statistically significant predictors when the other variables were introduced into the model and their effect controlled. Therefore, these will be excluded.

Considering the variables that gave significant results (ward where they work, research training and knowledge, and one of the factors of the attitudes towards research scale), the regression coefficients showed that the most important predictor of nurses' research activity was their research training. Those nurses with research training scored 3.82 higher on research activity, showing a more active participation in research activities. This was followed by the ward. Nurses working in intensive care units scored 2.95 higher in their research activity than nurses working in hospital wards. Regarding attitudes towards research, the factor 'nurses' characteristics' gave statistically significant results in the borderline. This means that those nurses who had more positive views regarding nurses' competency, interest and awareness towards research tended to be more research active (when the score increases 1 the final score of research activity increased by 1.004). Research knowledge was statistically significant with a $p < 0.0001$. Those nurses with more knowledge participated in more research related activities, in this case when the score increased the final score of research activity increased by 0.536.

b.2.2. Path analysis

Subsequently to the bivariate and multivariate analysis, path analysis was carried out to assess simultaneous relationships among variables (Bryman and Cramer 2005, p.314). Path analysis studies the pattern of relationships between three or more variables through the development of a path diagram which indicate the expected causal connections between them (see section on quantitative analysis in Chapter 2).

A hypothesised model was constructed based on the significant relationships found in the bivariate analysis and following the CMO configurations. In other words, the variables included in the path diagram were those with significant results in the bivariate analysis. The context variables included: research training (yes or no), age, contract (temporary or permanent), years of experience as a nurse and ward (intensive care versus hospital wards). The outcomes variables were: research knowledge, attitudes towards research (a mean value from Likert scales in both cases) and research related activities. To simplify the analysis, the outcome variables research related activities were grouped into a variable (RRA) giving a number that results from the sum of the different research activities. The 'attitudes towards research' was divided into three variables that represent the three factors obtained when the scale was factor analysed: 'research relevance (RR)', 'value of research for nurses (VR)' and 'nurses' characteristics (NC)'.

Therefore, in the model represented in Figure 3.13, there are ten variables introduced: training, age, contract, experience, wards, knowledge, RR, VR, NC and RRA. The arrows represent the expected connections between variables. Each p is a causal path. The model proposes that training has a direct effect on RRA ($p3$). Moreover, an indirect effect of training on RRA is also proposed as training affects knowledge ($p1$) and knowledge affects RRA ($p2$). The knowledge was also expected to have an indirect effect on RRA through the attitudes variables (RR, VR, and NC) ($p4, p5, p6$). Regarding the rest of the variables, while the ward is proposed to have both, direct and indirect effects on RRA ($p22$ and $p16, 17, 18$), the age, contract and experience are expected to have only an indirect effect on RRA by affecting attitudes (RR, VR and NC) ($p7$ to $p15$), which in turn affects RRA ($p19, 20$ and 21). In addition, there are five arrows coming from outside represented with the coefficient ϵ , which indicate the error or unexplained variance by the model.

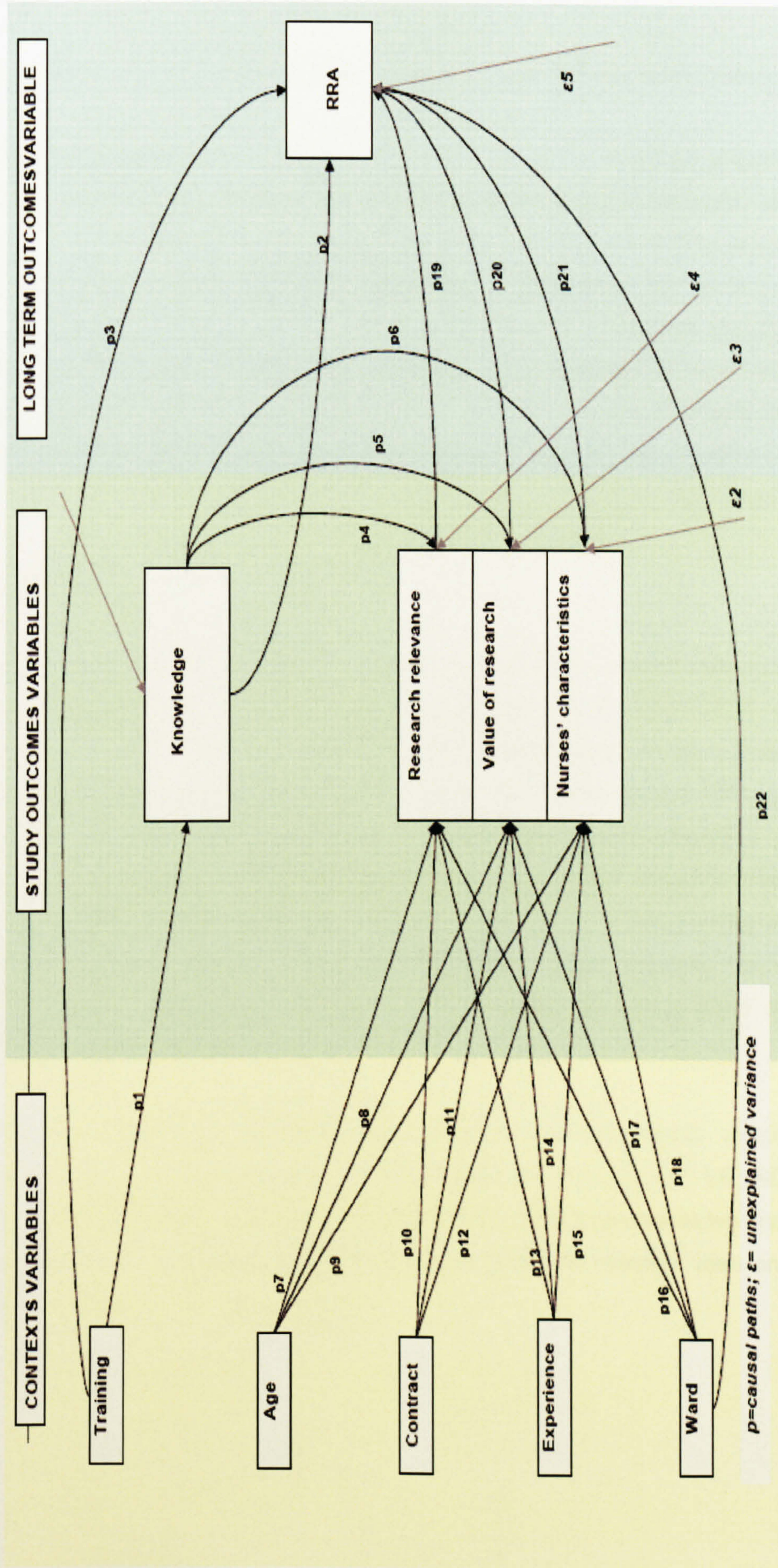
The structured equations designed for the analysis of the model are:

- Knowledge = (β) training + ε_1
- RR = (β) knowledge + (β) age + (β) experience + (β) contract + (β) ward + ε_2
- VR = (β) knowledge + (β) age + (β) experience + (β) contract + (β) ward + ε_3
- NC = (β) knowledge + (β) age + (β) experience + (β) contract + (β) ward + ε_4
- RRA = (β) training + (β) ward + (β) knowledge + (β) RR + (β) VR + (β) NC + ε_5

β = path coefficient; ε = unexplained variance

Multiple linear regression analysis was carried out for each of the equations. The significance level of $p \leq 0.05$ was used for beta regression coefficients.

Figure 3.13 Path diagram



Results

The ANOVA results of the five linear regression analysis are the following:

$$\text{Knowledge} = \text{training} + \varepsilon_1 \quad F=12.83; p<0.01$$

$$\text{RR} = (\beta) \text{ knowledge} + (\beta) \text{ age} + (\beta) \text{ experience} + (\beta) \text{ contract} + (\beta) \text{ ward} + \varepsilon_2 \\ F=11.702; p<0.01$$

$$\text{VR} = (\beta) \text{ knowledge} + (\beta) \text{ age} + (\beta) \text{ experience} + (\beta) \text{ contract} + (\beta) \text{ ward} + \varepsilon_3 \\ F=5.164; p<0.01$$

$$\text{NC} = (\beta) \text{ knowledge} + (\beta) \text{ age} + (\beta) \text{ experience} + (\beta) \text{ contract} + (\beta) \text{ ward} + \varepsilon_4 \\ F=1.770; p<0.122$$

$$\text{RRA} = (\beta) \text{ training} + (\beta) \text{ ward} + (\beta) \text{ knowledge} + (\beta) \text{ RR} + (\beta) \text{ VR} + (\beta) \text{ NC} + \varepsilon_5 \\ F=17.104; p<0.01$$

Results are represented in Figure 3.14.

Context variables had an impact on the outcomes. The research training and the ward have both direct effects on the RRA ($\beta=0.22$, $p<0.01$ and $\beta=0.26$, $p<0.01$, respectively). Moreover, the training had an indirect impact on the outcomes as the knowledge, which is affected by it, have an impact on the RRA ($\beta=0.35$, $p<0.01$). The total effect of training on RRA (direct and indirect) is $\beta=0.31$, $p<0.01$. The biggest influence in the RRA is made by the research knowledge ($\beta=0.35$, $p<0.01$) which is, at the same time, influenced by the training ($\beta=0.27$, $p<0.01$). The unexplained variance of the model without including the ward is $\varepsilon=0.97$. When the ward is included in the analysis, the unexplained variance decreases until $\varepsilon=0.75$.

The other contextual variables, age, contract and experience, which were expected to have an indirect impact on the outcome through RR, VR, NC, have been taken out from the model, together with the three variables indicating attitudes, as no significant relationships were identified between them and RRA (Figure 3.15).

Figure 3.14 Path diagram for RRA (coefficients and significance)

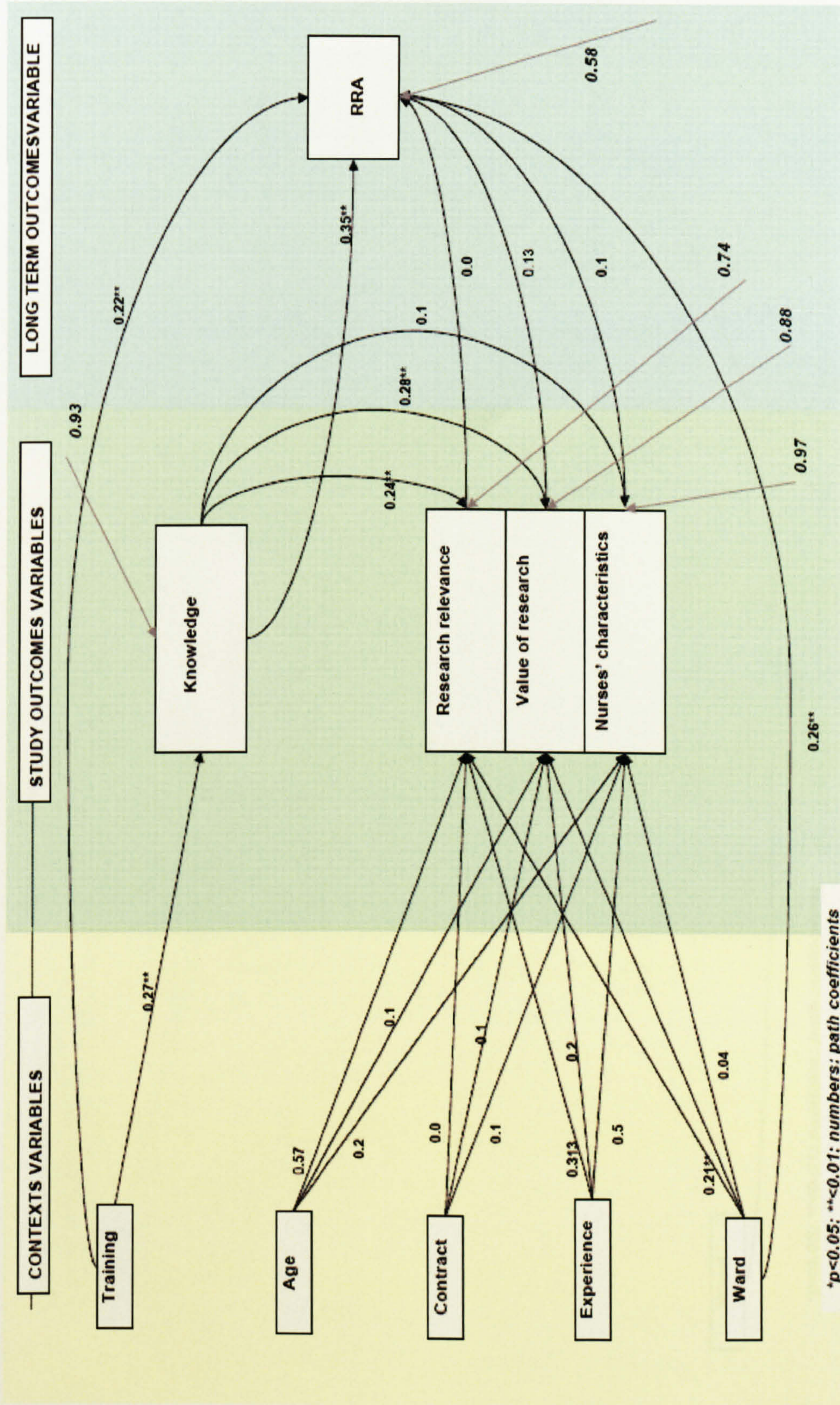
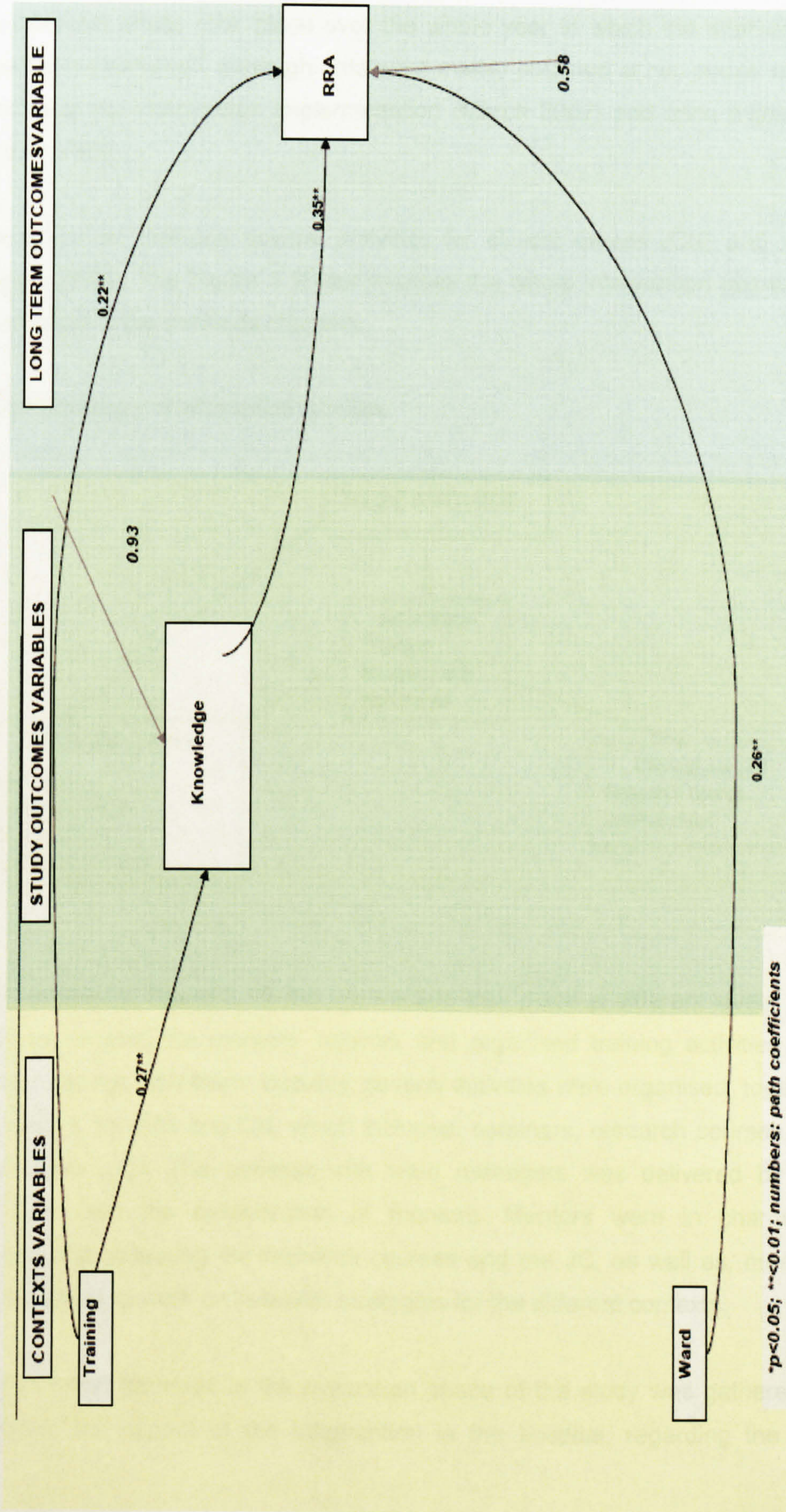


Figure 3.15 The path model

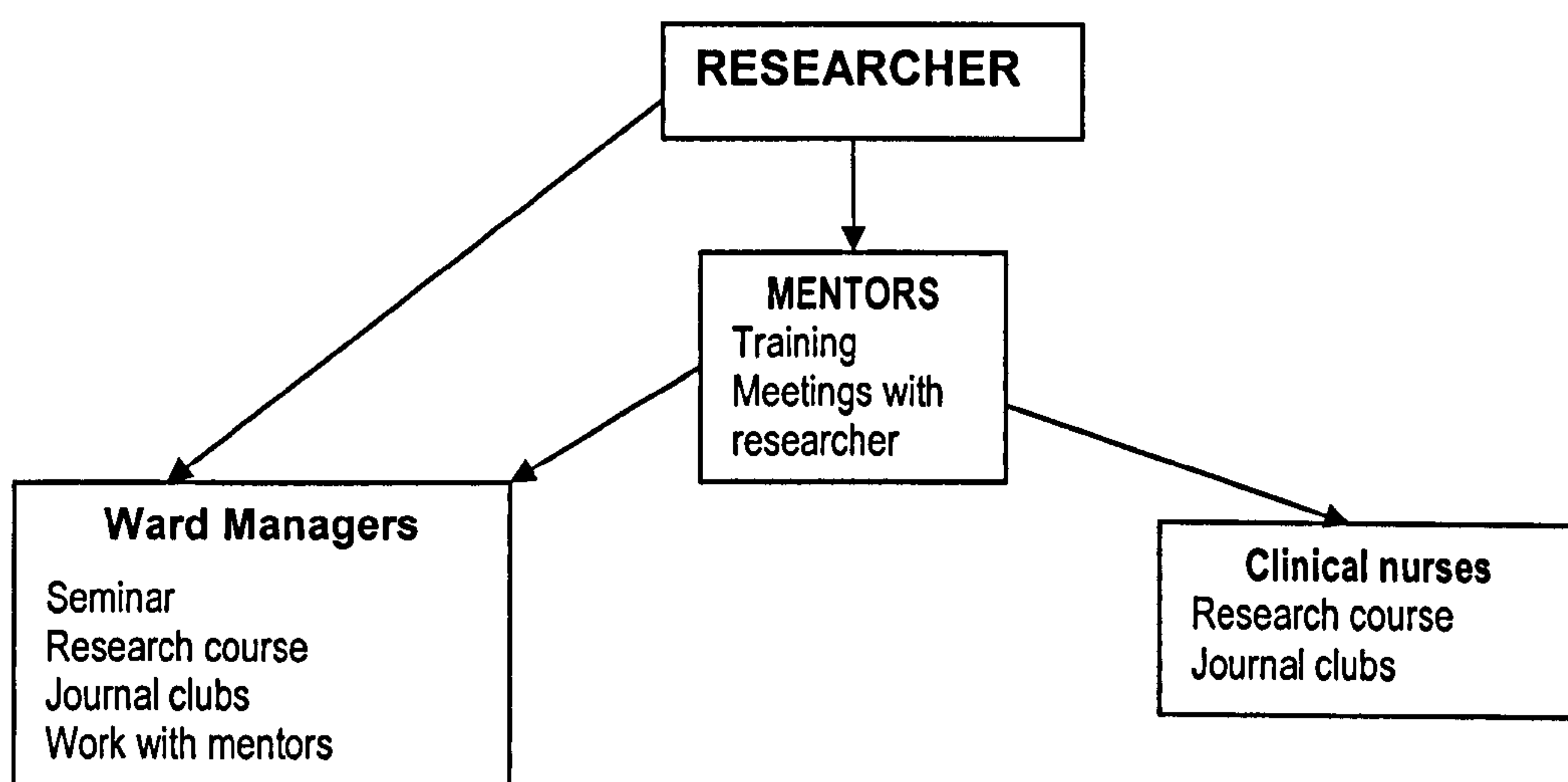


3.2. Evaluation phase results

The evaluation phase took place over the whole year in which the intervention was being implemented, although data were mainly obtained at two points: at the beginning of the intervention implementation (March 2007) and once it finished (February 2008).

The intervention included several activities for clinical nurses (CN) and ward managers (WM). The Figure 3.16 summarises the whole intervention (explained more in detail in the methods chapter).

Figure 3.16 Summary of intervention activities



As can be seen in Figure 3.16, the intervention took place at different levels. The researcher created the mentors' network and organised training activities and working meetings with them. Besides, several activities were organised, together with mentors, for WM and CN, which included: seminars, research courses and journal clubs (JC). The seminar with ward managers was delivered by the researcher, with the collaboration of mentors. Mentors were in charge of preparing and delivering the research courses and the JC, as well as, meeting ward managers to work on research strategies for the different contexts.

The information gathered in the evaluation phase of the study was gathered to understand the impact of the intervention in the hospital, regarding the two

outcomes of the study, nurses' 'research capability' and 'research related activity', as well as the intervention mechanisms and influencing contextual factors.

3.2.1. Evaluation results from ward managers

The evaluation data from ward managers (WM) was collected during the WMS before and immediately after it (March 2007), and in February 2008, once the implementation of the whole intervention was completed.

a. Results of the seminar 'A nursing research culture'.

Eleven ward managers (WM) of the hospital wards, where the intervention was being implemented, participated in the seminar. The main outcome of the work done with WM during the seminar was the identification of concrete actions that would be the basis for the strategies that they would be designing, together with mentors, for the research culture development in their units. The work done in the seminar was divided in three phases:

- a.1. Identification of the most influential factors for research
- a.2. Classification of factors: impact and complexity
- a.3. Planning of actions to act on the identified factors

a.1. Identification of the most influential factors for research

With the information about barriers and facilitators collected from ward managers, a table with all the influential factors for a nursing research culture was developed (Table 3.16). The Table was generated to allow participants to work more in depth on each of the identified factors, which were classified into three groups: culture in the hospital, ideas and scientific evidence.

Table 3.16 Main influential factors for the development of a research culture

UNIVERSITY HOSPITAL, CIMA, RELATIONSHIP WITH NURSING SCHOOL Comisions, library and other resources	
<p style="text-align: center;">CULTURE IN THE HOSPITAL (CUN)</p> <ul style="list-style-type: none"> •Attitude in practice: <ul style="list-style-type: none"> •Critique, reflective •Eagerness to improvement •Research in place: <ul style="list-style-type: none"> •Moments •Contents •Staff: <ul style="list-style-type: none"> •Motivation •Team work: <ul style="list-style-type: none"> •Own Role •Work organization: <ul style="list-style-type: none"> •Staff (number and characteristics) •Distribution •Prioritize, time administration •Support from the organization <ul style="list-style-type: none"> •Support from persons •Incentives •Career, professional development •Economical support 	<p style="text-align: center;">IDEAS</p> <ul style="list-style-type: none"> •To generate ideas •New ideas: <ul style="list-style-type: none"> •Courses, congresses •Professional associations •Journals, books •Intranet •Communication •New techniques •Data, indicators •Research themes <p style="text-align: center;">SCIENTIFIC EVIDENCE</p> <ul style="list-style-type: none"> •Training: <ul style="list-style-type: none"> •Research •Critique •Languages •Disponibility •Accessibility

**The grey area represents some of the main characteristics of the context: it is a University hospital with an Applied Medical Research Centre (CIMA) and close relationships with the Nursing School.*

a.2. Classification of factors impact and complexity

A next step of the seminar was to discuss in groups about the influential factors and classify them regarding their complexity (few or a lot) and impact (high or low). This was done as a way to prioritize the identified factors taking into account whether WM could act or change them by themselves, and the real impact that this would have in the research culture development. All the factors, but two, were classified as having high impact. This was not unexpected because they were already identified by ward managers in the questionnaire as important issues. Table 3.17 summarises this classification.

Table 3.17 Factors classification

		IMPACT	
		HIGH	LOW
COMPLEXITY	LOW	<p>Staff organization Distribution Support from the organization II* - support from persons II Attitude in practice: critique, reflexive III Research in place To generate new ideas II Scientific evidence: research, critique, languages Staff motivation Team work: own role II Work organization: staff</p>	<p>Intranet Revistas y libros</p>
	HIGH	<p>Ideas Training II Motivation III Team work (own role) Availability, accessibility III Prioritize-time administration II Attitude in practice Research in place: moments, content II Economic resources and grants Incentives Staff Work organization Support from the organization (incentives, resources, career) III Communication New techniques Data To generate ideas Career and professional development Research themes II</p>	

*II,III...: represents the number of times that the idea was repeated

a.3. The planning of concrete actions to act on the identified factors

Finally, during the seminar, WM planned concrete actions to act on the influential factors (Table 3.18), starting by the ones of the first quadrant of Table 3.17 which represent those factors with high impact and low complexity.

Table 3.18 Factors and actions planned

Factor	Actions planned
In general. Not specified	<ul style="list-style-type: none"> To search information about courses and congresses. Grants. To go to congresses every year (to explain to other colleagues what has been seen/learnt in the congress...) More participation with medical departments (sessions) To present clinical cases To know and use the resources of Internet in the units (search articles) and to disseminate in sessions or put in nurses' notice board To create a file with all the web pages interesting for the speciality Communication with other wards that have the same speciality
Attitude in practice Research in place	<ul style="list-style-type: none"> To ask nurses to enhance reflection To review the assessments and competencies To review nurses' protocols To search for the right time to write down about the themes of congresses, research and put in nurses' notice board To talk with mentors to search articles with interesting topics for nurses To have meetings with nurses in all the shifts Incentives for the extra effort: hours, free days... To organize staff facilitating them to leave the ward and work on internet... To change the organization and work distribution to facilitate nurses to be present in the medical rounds
Attitude critique and reflexive	<ul style="list-style-type: none"> To review documents To ask questions To do the nurses' competence assessment To organise specific training sessions for the ward
Attitude in practice Eagerness for improvement	<ul style="list-style-type: none"> Incentives To identify and facilitate nurses who are interested in research
Support from persons	<ul style="list-style-type: none"> Rigour Calendar Time
To generate ideas New Ideas	<ul style="list-style-type: none"> Ward managers: to dedicate time, to enhance communication To delegate in nurses aspects of their interest To provide information in the notice board/ congresses To put in the notice board interesting articles
Economical resources	<ul style="list-style-type: none"> To inform and administrate grants
Professional development	<ul style="list-style-type: none"> To facilitate and give incentives To establish 'working coffee times'

Thus, in this seminar WM were able to identify concrete actions for research culture development in their wards taking into account the real contexts.

b. Ward managers' perceptions about the seminar

After the seminar, 100% of WM stated that they would like to attend more seminars about the development of a nursing research culture in the hospital. When they were asked to specify the contents they would like to receive in future seminars, their answers were the following (Table 3.19):

Table 3.19 WM suggestions for next seminars' contents

Content	n
Strategies to develop a research culture	3
Scientific evidence, information searching	2
Attitude in practice and staff motivation	1
How to plan a research project	1

Ward managers were also asked about whether their expectations regarding the development of a research culture in their wards had changed after the WMS and 90% stated that those did change. Only one participant stated that her expectations did not really change because, although she got new ideas to start with, the workload in her ward was too high. Regarding the reasons why most ward managers' expectations had changed, answers had been content analysed and results appear in Table 3.20.

Table 3.20 WM change of expectations after the seminar. Reasons

Identification of realistic and concrete actions (n=4) The provision of real support with (n=3): -The intervention (mentorship, training) -The NRDA in the hospital An increase in their motivation (n=1) Reflexions made during the seminar (n=3)	Some quotations: WM2 I see strategies that are realistic to apply in my ward and I have seen that nursing research is going to be supported. WM6 I think that it is not as difficult as I thought, especially because I have support. WM9 I have reflected and thought about this more in depth. It is not difficult to think about small actions and objectives that could be achieved in short and medium term.
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Finally, ward managers were asked to re-think about the barriers and facilitators they perceived for research development to compare them before and after the seminar and to identify real changes. Results are shown in Table 3.21:

Table 3.21 Barriers and facilitators before and after the seminar

In 3 out of 9 wards: same facilitators and barriers before and after the WMS.
In 1 out of 9 wards: after the WMS facilitators increased and barriers the same.
In 3 out of 9 wards: same facilitators and changes in barriers after the WMS:
- Barriers decreased:
Before the WMS: lack of training, lack of support, lack of time and language.
After the WMS: lack of training.
- Barriers different:
Before the WMS: lack of time and workload
After the WMS: lack of motivation, lack of incentives, lack of doctors' support
In 2 out of 9 wards: completely different facilitators and barriers before and after the WMS

Thus, it seems that the work done during the seminar was useful for WM and made them aware of the fact that, although there are some important barriers, they, as ward managers, could introduce some initiatives that could have an impact on nursing research development.

c. Ward managers' perceptions after the whole intervention

Once the intervention activities finished (February 2008), a questionnaire with open questions was completed by 11 ward managers of hospital wards. Ward managers' results have been grouped into themes that follow the realistic evaluation approach: intervention outcomes (O), mechanisms (M) and contexts (C). These themes are:

- c.1. Intervention outcomes: Changes in nursing research culture
- c.2. Contextual factors affecting the intervention and the outcomes
- c.3. The intervention and its mechanisms
- c.4. Ideas and priorities for future interventions

c.1. Intervention outcomes: Changes in nursing research culture

Ward managers' perceptions regarding changes in the nursing research culture were studied. Some of them, six out of eleven WM, considered that the research culture changed 'moderately' in their units during the intervention period while the others did not perceive any change 'at all'.

The changes they perceived were related to nurses' awareness and attitudes towards research, which seemed to be better. They considered that after the intervention nurses were more motivated and perceived the need for research:

WM7V. I think that those nurses who attended the courses and journal clubs have understood the need for nursing research and its relevance in their practice.

Ward managers gave their point of view regarding the reasons and the factors that influenced the intervention outcomes, and these have been grouped in: contexts or contextual factors (C) and intervention mechanisms (M).

c.2. Contextual factors affecting the intervention and the outcomes

The contextual factors seemed to play a determinant role in the outcome of the intervention. In the hospital a **new human resources policy** was introduced during the intervention period and this changed the context completely. At the beginning of the study, the nursing staff had more stability and was able to attend courses during the shifts. The new situation in the hospital has led to staff shortage and lack of stability. This had increased the workload and therefore, nurses did not have the possibility to leave the shift to attend seminars or courses. As a result of the situation regarding staffing issues, nurses are burned-out and not motivated to participate in research activities:

WM2V. It has been a difficult year. Due to a staff shortage, now nurses are only able to work. The lack of motivation is now generalised among nurses.

WM6II. The intervention was well designed with concrete objectives but the circumstances were different when it was planned.

The following quotation was made by the ward manager of a unit where, before the new human resources policy, every year nurses participated in research activities. As it can be noticed, the situation nowadays is different:

WM5V. I am scared. In 33 years of experience I have not seen anything similar. There is no time and no enough staff at all. We are coming back to the model we always wanted to avoid: nursing doing and doing, only tasks, without an integrated vision of the patient. It is a pity, in this ward we had always do things like attending conferences, presenting papers... but now it is simply impossible.

Nevertheless, it has been noticed that, although the general context of the hospital had changed, there were some **differences among units**. This was the case of oncology areas, where the intervention activities had more acceptance and were more successful. These differences in people's participation, involvement and attendance may be explained due to the motivation and

attitudes of nurses and, to the ward managers' and mentors' involvement. Therefore, the **characteristics of the persons** working in the units are important contextual factors to bear in mind when explaining the outcomes.

Finally, another contextual change in the hospital, to which one WM made reference, was the creation of the new area NRDA led by a nurse. It was seen as a potential facilitator for nursing research development in the hospital.

c.3. The intervention and its mechanisms

One of the aspects explored with ward managers was their perceptions about the intervention in general and the specific contributions of the activities run in the hospital, RCO, JC and MN, to understand the mechanisms that may explain the outcomes.

In general, ward managers agreed that the most effective activities were the JC and the RCO and WMS. Regarding **JC**, they commented that they were an opportunity to interact and share ideas among peers, and to apply the knowledge achieved in research courses. Journal clubs were interesting and helpful to get familiar with research, learn how to read and critically appraise a paper and motivate nurses. They were also effective to increase nurses' awareness of research relevance for nursing practice. Besides JC contributions, **the RCO and WMS** were seemed as essential to provide them with some basic knowledge about research methods and to think about specific actions to develop the nursing research culture.

Regarding the **work with mentors**, planned to continue working on the actions for research development that WM identified during the seminar, although ward managers valued it as a good initiative, it was not set up in most of the cases. The reasons for this, from the ward managers' point of view, were mainly two: impossibility to meet together due to workload and other commitments and, the ward managers' and mentors' roles not adequately defined. Moreover, they insisted on the fact that the personal relationship between ward manager-mentor and mentor-nurses was important. For instance, the following two quotations made reference to the same mentor:

WM6V. ...with the mentor very bad. People were not happy with her. She was not involved at all!

WM6II. She (the mentor) was not happy with her situation, she felt that she should have more 'rights' in the ward because of her academic preparation. She is not the 'motor' and does not change things. She is not a leader. There is not good 'feeling' among us. Maybe, I could have facilitated mentors' work but considering the bad situation, for me, this was in the last place...

In general, according to ward managers' views, the intervention was well planned. They agreed that the principal mechanisms that had a positive impact on the nursing research culture were the fact that the research training and the support received from research experts (mentors) made nurses feel more motivated to participate in research activities and gave them the possibility to put their knowledge in practice with the JC.

Nevertheless, ward managers identified other mechanisms that had a negative impact on the intervention, some of them due to intervention external factors like the changes in the context mentioned above. For instance, they agreed that there was **no continuity** in the activities due to difficulties in organising the sessions, nurses' impossibility to attend, lack of stability of staff, and lack of time:

WM3III. ...we started very well but afterwards there was no continuity and time to dedicate to it (research activity)

WM2II(im). Due to a lack of staff stability in my unit and a lack of motivation among nurses, we could not run any initiative to change the research culture. We are still adapting to structural changes in the unit.

They insisted on the idea that the new situation regarding human resources and staffing issues had an impact on nurses making them feel no motivated to participate in research activities. Another mechanism, related to the lack of a research culture in the hospital, was that research was **something 'extra'** and no part of nurses' work. Therefore, it was not facilitated during the shift and it was perceived by nurses as an extra-effort that they did not want to do.

c.4. Ideas and priorities for future interventions

Taking into account the intervention outcomes, and the contexts and mechanisms that, according to WM, had an influence, they were asked about aspects that they would have done differently. Their ideas can be summarised in the following headings: adjustment to the new context, more facilities, more research activity and continuity, nursing school and hospital links and, ward managers and mentors relationship/roles. As will be noticed in the following paragraphs, these headings made reference to both contextual aspects and mechanisms that could be modified to achieve better outcomes in the nursing research culture development.

Most of the ward managers insisted on the impact of contextual changes on the intervention's outcomes and they agreed that the new situation should be considered before continuing:

WM6II. We should start again taking into account the new situation. My ward has changed, the ambiance among nurses is very bad, the work organization has also changed...

Besides the importance of an **adjustment to the new situation**, they insisted that they needed **more facilities** if they wanted to develop the research culture in their units. These facilities should include: more staff, staff stability, training opportunities, and time during the shift for nurses to attend training activities:

2V. ...to adjust staff to workload. This will help to motivate nurses.

2II (pediat). ...to stabilize the staff. This will make nurses to be much more involved and willing to participate in research. There are people with interest but the situation makes them feel demotivated.

As seen in the quotation above, ward managers considered that an improvement on working conditions would have an impact on nurses' involvement and motivation to participate in research.

Regarding some mechanisms that could be important to introduce in a future intervention, ward managers stressed that it could be helpful to start **doing a research study** really interesting for nurses and that its application to practice could have a clear impact in patient's care. In other words, ward managers believed that nurses needed to perceive the research impact in practice to feel motivated to participate in research activities:

WM7V. To facilitate those motivated nurses, with the help of their peers, to participate in a research study with an interest for them and with a potential impact on patient's care.

They insisted that more **continuity** and a better planning of the activities were needed to get a real impact on the research culture.

One of the ward managers highlighted that one of the principal mechanisms could be to establish **more links between the Nursing School and the hospital**. She stressed that there was a need for experts' support to conduct research activities and that those experts were mainly in the university:

WM6II. The research activity and experience is more in the academic world, I think that it should be like that but with connections with nursing practice to apply research findings in practice.

Finally, ward managers identified the **relationships between them and mentors** as one of the key mechanisms for research development. They stressed the importance of having a good personal and professional relationship with the mentor that allows both to play their role. Moreover, they insisted on the idea that mentors should have some personal characteristics/attributes to be able to play a leadership role, independently of the situation given by the context:

WM6II. The mentor's role should be more active. Our mentor has not been a leader and did not set up the initiatives. She has been in the background.

To summarise, the WM valued the intervention as a good initiative and identified some changes in the nursing research culture after its implementation. Nevertheless, there were contextual changes and other mechanisms that influenced the outcome. The identification of these factors that have affected the intervention is crucial to explain the results and for the planning of future intervention with the same objectives.

3.2.2. Evaluation results from clinical nurses

The evaluation with nurses was focused on determining the impact of the intervention on the two principal outcomes of the study: nurses' 'research capability' and 'research related activity'.

The complete data collection process, including nurses' groups, instruments, moments and response, appears summarised in the following Table 3.22.

Table 3.22 Summary of evaluation with clinical nurses

	GROUPS	Baseline (T0)	T1	T2	T3	Instruments
Intervention	A	n=15	n=7 n=7	n=7 n=7	n=13 n=11	NRQ Research knowledge objective test Facilitators and barriers scale Journal clubs questionnaire
	B		n=81 n=82	n=81 n=82	n=24 n=34	NRQ Research knowledge objective test Facilitators and barriers scale Journal clubs questionnaire
	A&B	n=15	n=88 n=89	n=88 n=89	n=37 n=45 n=41	NRQ Research knowledge objective test Facilitators and barriers scale Journal clubs questionnaire
Control	C	n=81			n=61	NRQ NRQB

T1: Before the RCO; T2: immediately after the RCO; T3: 12 months after the RCO and JC

As can be seen in Table 3.22, group C participated at T0 and T3 (baseline and final evaluation phases) while, with the intervention group (A&B), data were mainly collected at T1, T2 and T3. The column on the right indicates the instruments completed by each group and the ones in the middle the point at which they were completed and the number of nurses that answered.

The total sample of nurses in the T1 and T2 evaluation phases was N=97 (15 group A and 82 group B). In the T3 evaluation phase of the study the total sample of nurses was N=138 (81 group C and 57 group AB) and the overall response rate achieved was 77%. The following Table 3.23 specifies the response by wards. As it can be seen, in seven wards the response was 100% and only in two, less than 50%. The collaboration of ward managers was essential to achieve high response rates. In fact, the WM of the wards with the lowest response rates (22% and 11%) had suffered recent changes in their posts and responsibilities, which might have affected their level of involvement in the data collection process.

Table 3.23 Evaluation response rate

Ward	Nurses	Questionnaires back	Reminders	Response rate
2V	4	4	1	100%
2II	4	3	2	75%
2II (Paediatric)	10	7	1-2	70%
3	10	10	1	100%
5II	9	1	1	11%
5V	8	5	2	62.5%
6II	10	10	1-2	100%
6V	13	13	1	100%
7V	7	7	1	100%
8II	9	2	1	22%
UCI	25	25	1	100%
Intermedios	4	4	1	100%
TOTAL HOSPITAL	113	91		80.5%
ESPECIAL SERVICES	25	15	1	60%
TOTAL RESPONSE	138	106		77%

a. Results from control group of nurses (GROUP C)

The control group was composed of nurses who did not take part in the intervention (n=81). These were hospital wards nurses who did participate in the baseline phase of the study by answering the first questionnaire (NRQ) designed to obtain information to understand the nursing research culture in the hospital and to plan the intervention. All those nurses were contacted again in the final evaluation phase of the study (T3) to gather information to gain a better understanding of whether the expected outcomes in the intervention group were due to the intervention, 61 nurses participated (75% response rate). This information was obtained with a similar but shorter version of the first questionnaire, the NRQB.

The outcomes measured in group C nurses and the analysis done to compare them in the baseline and evaluation phases of the study appear in Table 3.24.

Table 3.24 Outcomes in group C at T0 and T3

Outcomes	Variables	Type of variable	Analysis
Research capability (RC)	Research skills	Quantitative	t-student paired samples
	General research knowledge	Qualitative	Descriptive/Percentages
	Attitudes towards research	Quantitative	t-student paired samples
Influential factors	Facilitators & Barriers	Qualitative	Content analysis
Research related activity (RRA)	Participation in research activities	Qualitative	Descriptive/Percentages
	Use of material resources	Quantitative	t-student paired samples
	Use of research in practice	Quantitative	t-student paired samples

Ninety eight percent of group C nurses indicated that they did not receive any research training since T0, and 82% did not participate in any research activity since then. Therefore, it was expected to find no differences in the variables measured in this group of nurses, as they had not participated in the intervention and most of them did not take part in other research courses or activities.

The next table (Table 3.25) summarises the statistical results for the quantitative variables, which will be further explained in the following paragraphs together with the rest of variables displayed in Table 3.24.

Table 3.25 Statistical results in group C

Outcomes	Variables	T0 and T3 Mean difference	SD*	t**	df***	Sig**** (2-tailed)
RC	Research skills	0.267	3.364	0.614	59	0.542
	Attitudes towards research	3.066	8.126	2.947	60	0.005
RRA	Use of material resources	0.288	1.829	1.210	58	0.231
	Use of research in practice	0.450	2.459	1.417	59	0.162

*Standard deviation; **t-student; ***degrees of freedom; ****p value

a.1. Research capability

Regarding nurses' **research skills** at T0 and T3, statistical results showed no significant differences. t-test for paired samples found no significant differences in the means of research skills at both times ($t=0.614$, $p=0.542$). Something similar happened with nurses' general perception of their **research knowledge** being considered as none or low at both times by most of the nurses (94% at T0 and 95% at T3).

Nurses' attitudes were measured with 'the attitudes towards research scale' a 19 item Likert scale (Cronbach alpha= 0.805), and results indicated that, although, they were not directly involved in the intervention activities, control nurses' **attitudes towards research** improved significantly during the intervention period ($t=2.95$, $p<0.01$).

Nurses also had the possibility to give their opinions about nursing research through an open question. Sixteen nurses answered to this question and nine of them highlighted that research was important, necessary and essential for the nursing profession. The following quotations illustrate this idea:

CN61. It is essential for the development of nursing profession and to receive an acknowledgment from society and other professionals.

CN13. I think that nursing research improves the quality of nursing care and that it is important and necessary.

The other seven nurses' answers were more focused on the existing barriers and the lack of facilitators to do research than on their opinions about research itself.

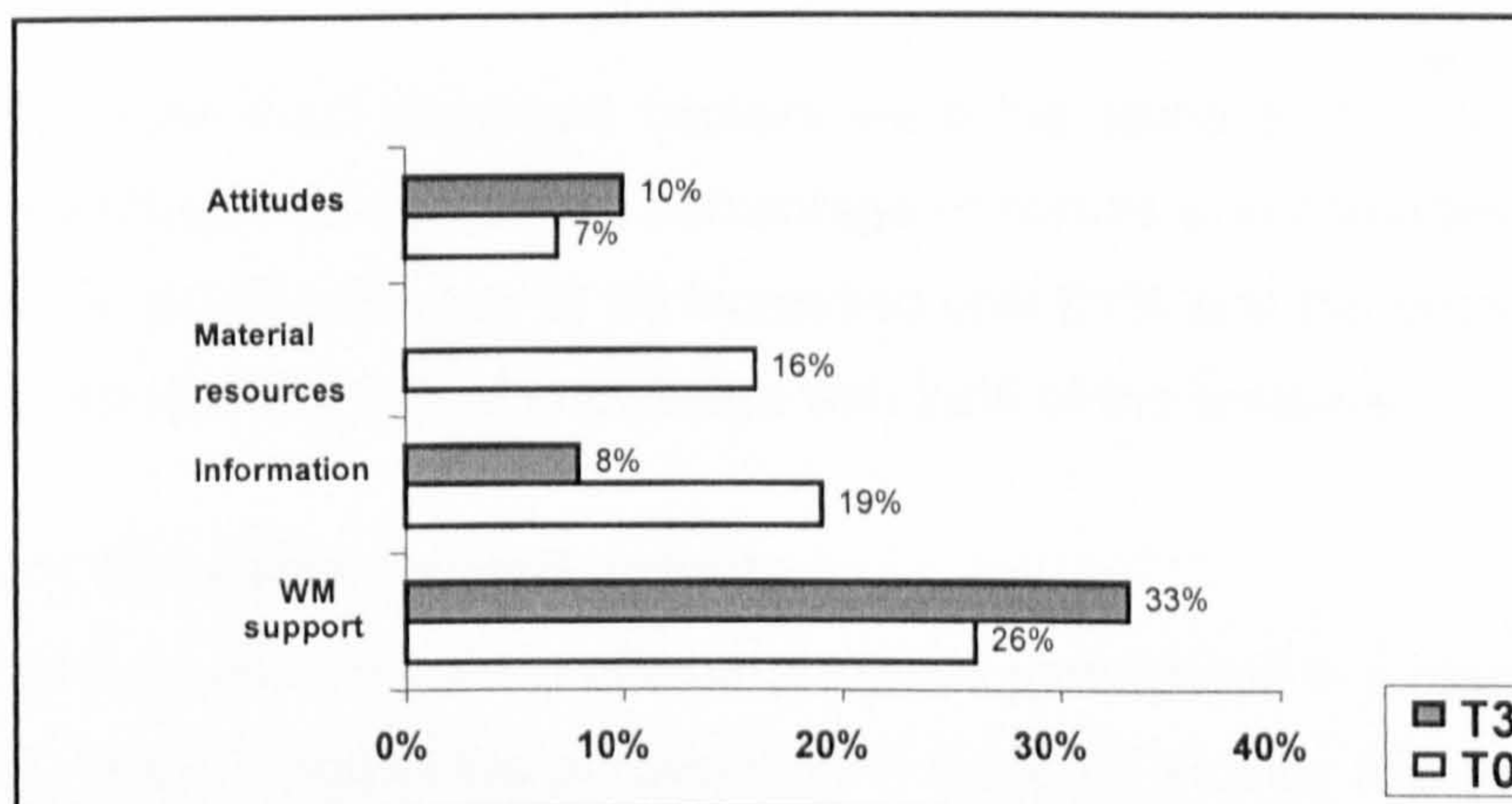
a.2. Influential factors: facilitators and barriers

Nurses' perceptions on facilitators and barriers to participate in research activities were gathered with open-ended questions and results were content analysed. The main facilitators and barriers perceived at T3 were compared with the ones obtained at T0 for participating in research studies, to have a template of their tendency during the intervention period and, as explained in the following paragraphs, they did not seem to have changed substantially along the study.

a.2.1. Facilitators to participate in research activities

Sixty nurses answered this question and 50% highlighted the fact that they had 'no facilitators at all' to do research. The facilitators identified by the other 50% of nurses appear summarised, and compared with those at T0, in Figure 3.17:

Figure 3.17 The most important facilitators at T0 and T3



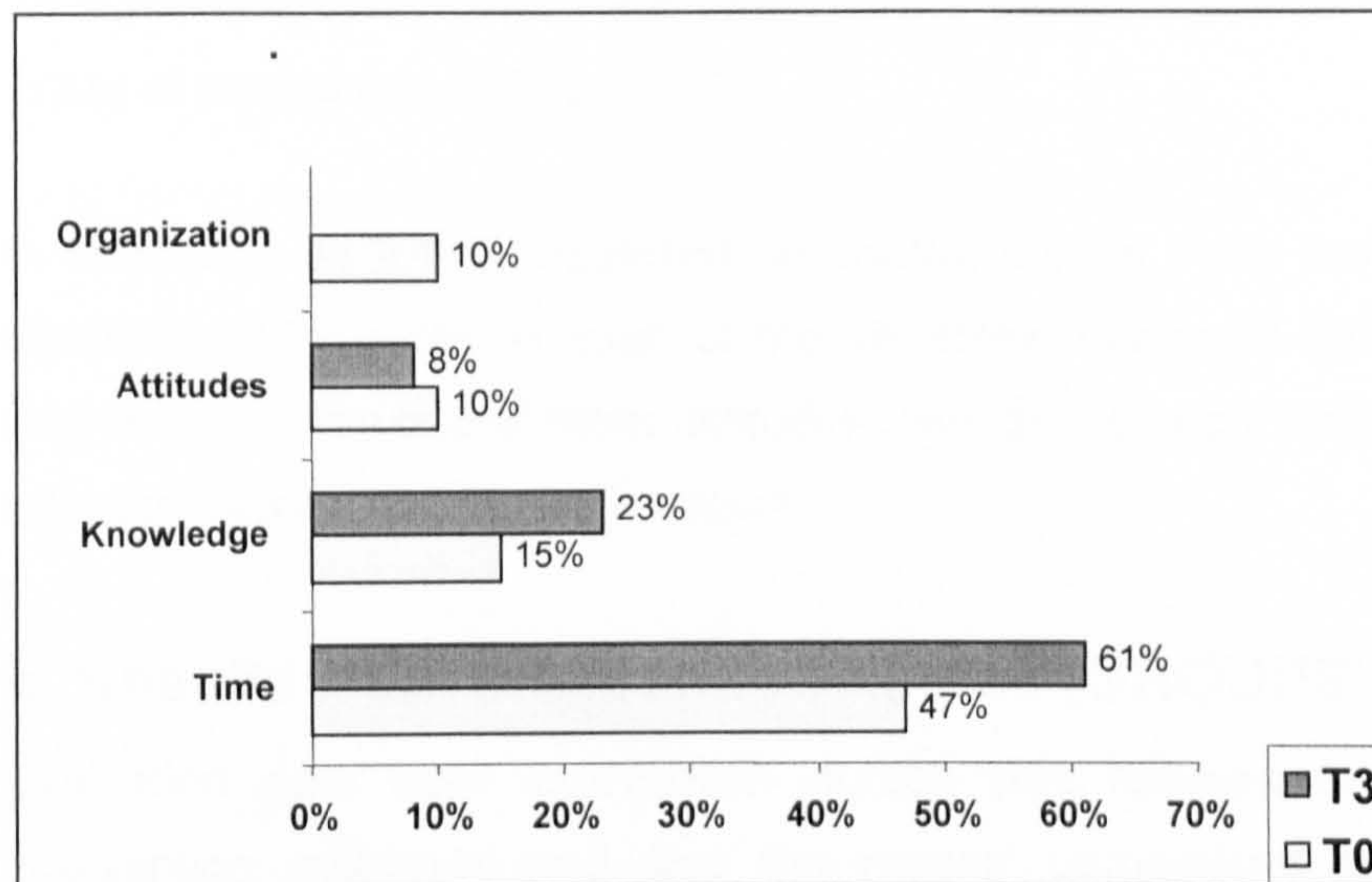
As can be seen, the principal facilitators at T3 were similar to the ones at T0. As it was the case at T0, the ward managers' support was perceived as the principal facilitator to participate in research activities, although its percentage increased to 33% at T3. The second most important facilitator at T3 was nurses' positive attitudes and motivation. In addition, it was noticed that, although the material resources and accessibility to information were identified as important facilitators at T0, at the evaluation stage, these percentages decreased until 0% and 8%

respectively. This might be explained because, as it has been just mentioned, at T3, those factors related to the research capability of nurses were considered more determinant for their participation in research.

a.2.2. Barriers to participate in research activities

Fifty nurses answered to this question at T3 and results are summarised and compared with the ones at T0 in the following Figure 3.18:

Figure 3.18 The most important barriers at T0 and T3



The three most important barriers were the same at T0 and T3, although the percentages changed. The percentage of nurses who considered the lack of time as the principal barrier at T3 increased until 61% and the second most important barrier was the lack of knowledge with 23% of the answers.

a.3. Research related activity

Eighteen percent (n=11) of control nurses participated in a research activity since T0, which included the participation in research studies and the preparation of a communication for a conference, n=8 and n=5 respectively. All of them considered this experience as positive; very good: 73% and good: 27%. Again, as at T0, nurses were asked, through an open question, about the reasons for this and the content analysis of the answers gave the following results summarised in Table 3.26:

Table 3.26 The experience of doing research activities

Learning experience (n=4)
Motivating (n=2)
Open my mind (n=4)
Help for daily practice (n=3)

Regarding the use of material resources at T0 and T3, results showed no significant differences in the use of databases and the library facilities. Moreover, no significant differences were found in the use of research in practice by this group of nurses ($t=1.417$, $p=0.162$).

In summary, as it was expected, in control nurses there were not statistically significant differences in most of the variables measured before and after the intervention. Only one of them, attitudes towards research, increased significantly after the intervention implementation.

b. Results from intervention nurses (GROUPS A & B)

Evaluation data from intervention nurses was focused on determining the intervention outcomes and also the nurses' perceptions about the different activities which would help to provide more comprehensive explanations of the results.

The evaluation of the intervention nurses took place at three different stages: T1, T2 and T3. The total number of intervention nurses that took part in the different evaluation phases of the study was 89 at T1 and T2 and 57 at T3. The number of nurses at T3 decreased due to staffing issues, staff shortage, changes to other working areas or hospitals, and sick leave.

The objective of the evaluation was to identify whether the intervention had an impact on the principal expected outcomes of the study and, therefore, the same variables were measured along the intervention period. As the intervention was mainly orientated to develop nurses' 'research capability', the evaluation of the intervention nurses was focused on this outcome. Also, their perceptions on an aspect of the research capacity, the influential factors: facilitators and barriers; were measured to see the intervention impact.

The following Table 3.27 summarises the outcomes, the variables and the statistical analysis conducted.

Table 3.27 Outcomes in the intervention group at T1, T2 and T3

Outcomes	Variables	Type of variable	Analysis
Research capability (RC)	Research knowledge Skills to use research (critical appraisal)	Quantitative Quantitative	ANOVA & t-student paired samples t-student paired samples
Influential factors	Facilitators & Barriers	Quantitative. Likert Scale	ANOVA & t-student paired samples

b.1. Research capability

Regarding the **research knowledge**, ANOVA indicated highly significant differences in means at T1, T2 and T3 ($F=970.2$, $p<0.001$). To identify those differences, t-tests for paired samples were conducted and results were the following (Table 3.28):

Table 3.28 Statistical results for research knowledge

	Time	Mean differences	SD	T	df	Sig. (2-tailed)
Research knowledge	T1-T2	-4.24	2.68	-14.64	85	0.000
	T1-T3	-3.78	4.47	-4.39	26	0.000
	T2-T3	0.61	3.60	0.89	27	0.381

As indicated in Table 3.28, the research knowledge of nurses increased significantly after the course (T1mean=9.7; T2 and T3means=13.9 and 13.1 respectively) and the level of knowledge achieved after the course was maintained along the intervention period ($p<0.017$ in both cases).

Nurses' **skills to use research findings** (searching and appraising the literature) were also measured in intervention nurses, results reported in Table 3.29 show significant differences:

Table 3.29 Statistical results for skills to use research findings

	Time	Mean differences	SD	T	df	Sig. (2-tailed)
Skills to use research	T1-T2	-0.630	1.411	-4.124	82	0.000
	T1-T3	-1.333	1.871	-2.138	8	0.065
	T2-T3	-0.750	1.488	-1.426	7	0.197

Nurses' skills to search and read the evidence clearly improved after the research course at T2 and, due to the results at T3, almost significant differences between T1 and T3 mean values, it seems that this improvement was maintained, and the p value ($p=0.065$) was due to the small sample size, $n=9$.

b.2. Influential factors: facilitators and barriers

Nurses' perceptions about **facilitators and barriers** to participate in research activities were measured through a 27 item Likert scale (Appendix 18). The Cronbach's alpha of the scale was: $\alpha= 0.74$ at T1, $\alpha= 0.81$ at T2 and, $\alpha= 0.78$ at T3. ANOVA test for repeated measures indicated significant differences between means ($F=1920$, $p<0.001$), therefore, to identify those differences, t-test for paired samples were conducted and results appear displayed in the following Table 3.30:

Table 3.30 Statistical results for facilitators and barriers

	Time	Mean differences	SD	T	df	Sig. (2-tailed)
Facilitators & Barriers	T1-T2	-0.814	7.140	-1.057	85	0.293
	T1-T3	2.808	12.413	1.153	25	0.260
	T2-T3	5.571	10.279	2.868	27	0.000

There were no significant differences in nurses' perceptions before and immediately after the course, but these were significant at T3, after the whole intervention period. The mean at T3 decreased significantly, which indicates that nurses perceived more barriers to participate in research activities at T3 than at the beginning of the intervention ($p<0.017$).

Thus, in intervention nurses, all the variables changed significantly during the intervention. Regarding the research knowledge and skills, an increase was noticed immediately after the RCO, which was maintained along the whole intervention period in which JC were run. However, their perceptions about the facilitators to participate in research activities decreased significantly during the intervention.

b.3. Nurses' perceptions after the research course

Nurses' perceptions about the RCO were gathered at T2 of the evaluation phase of the study, which took place immediately after the course. Eighty nine nurses attended the RCO and 100% of them stated that they would like to receive more

research training about: data analysis, critical appraisal of the literature, databases searching, statistics, design of research studies, and about how to put research in practice. They were asked to evaluate the course, from one to ten, regarding its utility, interest and delivery, and their answers gave the following means (Table 3.31):

Table 3.31 Nurses evaluation of the research course

Utility (m*= 8.78; SD**: 1.30)
Interest (m= 8.8; SD: 1.14)
Delivery (m=8.35; SD: 1.2)

*mean, **standard deviation

In addition to this, in the questionnaire there was an open question asking them for additional comments after the RCO. Fifty percent wrote comments and all of them were positive indicating that nurses considered it as an interesting and useful activity. Some nurses highlighted that, before, they were not aware of the research relevance but that the course changed their perception and motivated them to continue learning about it. Nurses stressed a willingness to participate in the intervention activities like the JC. The following Table 3.32 illustrates some quotations:

Table 3.32 Nurses' comments about the research course

-
- CN2. The course has been very interesting, it has motivated me to continue working on this field and to read and to do future studies related to our practice. It has changed my wrong perception about research.
- CN25. This is a great start! This is an area that I did not know before but now I will start paying attention to research.
- CN7. The objectives of the course have been covered but during the journal clubs is when we will really start learning something. It has been very useful and clear.
- CN33. It has been very interesting. I hope that the project will continue.
- CN11. To participate in this course has been very positive.
-

Another open question was included in the questionnaire to collect information about participants' opinions regarding nursing research in general. The answers showed that clinical nurses considered that research was necessary for the development of the profession and the improvement of their practice. The following quotations clearly illustrate the idea (Table 3.33):

Table 3.33 Nurses' opinions about nursing research

CN12. It is important and necessary to improve our practice and the quality of care that receive our patients (this idea was the most often repeated by nurses).
CN10. It is something we 'ought' to do and now we can start to feel that we have the capacity to do so.
CN26. It is the future of nursing.

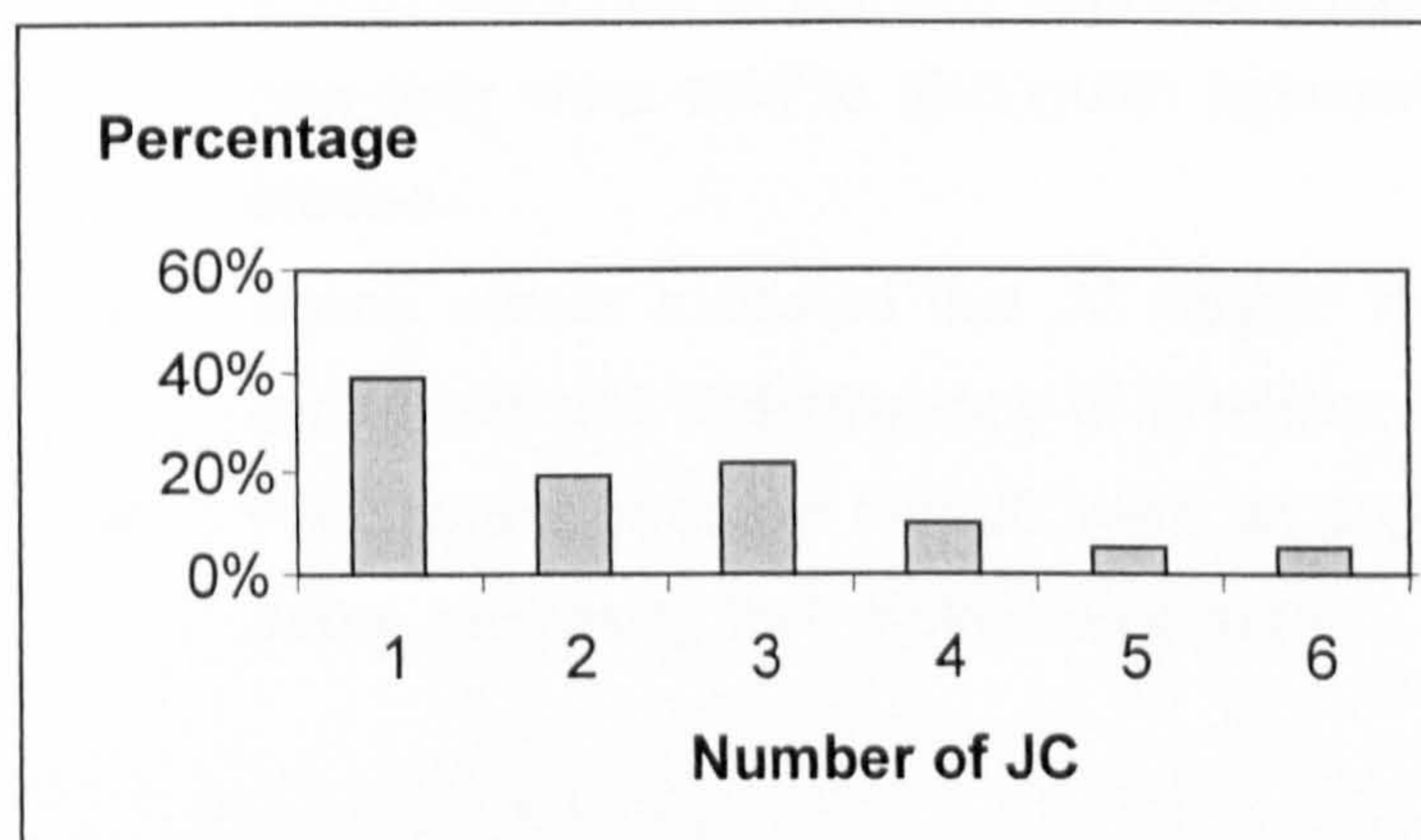
b.4. Nurses' perceptions of the journal clubs

Eleven JC were conducted in the hospital from April to December 2007. The following Table 3.34 indicates the number of JC conducted in each of the areas.

Table 3.34 Journal clubs conducted in the hospital areas

Area	Number of JC
Cardiology	2
General Surgery	2
Neurology	1
Internal Medicine	0
Oncology	6

Fifty one nurses attended the sessions and the following Figure 3.19 specifies the number of journal clubs attended by nurses:

Figure 3.19 Journal club attendance

Approximately 80% of nurses attended from one to three JC and 89% of participants stated that they would have liked to attend more. Nevertheless, they had several impediments such as, incompatibility with their shifts, personal reasons and an inadequate diffusion of details of times and venues of some of the sessions.

Nurses were asked, through an open-ended question, about the reasons that motivated them to participate in JC. Thirteen nurses responded and their answers were content analysed. It was found that the interest of the papers' topic and the relevance for their practice were the principal reasons (n=6) for nurses to participate in JC. This was followed by nurses' motivation to learn how to read and critique a paper (n=5). Also, two nurses stated that they attended the sessions because they had curiosity and one because the ward manager motivated her to go.

Regarding the effectiveness of the JC, a scale with eight items to rank from one (very effective) to five (no effective) was used (Appendix 19). The mean: 1.6 indicated that, in general, nurses considered JC as a very effective activity. Looking separately at the items, it was noticed that the effectiveness of JC relied more in: learning how to critique research (70%); increasing research awareness (63%); increasing interest in reading (51%) and, increasing interest in research (48%); as values lay between one and two.

In addition, nurses were asked, through an open-ended question, about the main contributions of JC, twenty seven nurses answered and the content analysis of their opinions gave the following results:

- Sixteen stressed that JC were an opportunity to understand research and to learn how to critically appraise a paper; highlighting the fact that now they were able to distinguish between 'good' and 'bad' research studies.
- Seven nurses indicated that JC helped to increase nurses' research awareness and understanding of its relevance for nursing practice.
- Four nurses stressed that JC were an opportunity to share ideas with peers, increasing their motivation at work.

3.2.3. Evaluation results from mentors

The mentors' network was established in several units in the hospital. In total there were six mentors and each of them was responsible for one or two wards. During the intervention, mentors' perceptions were gathered through informal interviews and written reports. Once the intervention activities were completed, a questionnaire with open questions was filled in by them, being this the main source of evaluation data from mentors (Appendix 23). Mentors' results have been grouped into three major themes following the realistic evaluation approach (context (C)-mechanisms (M)-outcomes (O)). These themes are:

- a. Intervention outcomes from mentors' point of view:
 - a.1. Changes in nursing research culture
 - a.2. Experience of being a mentor
- b. Intervention mechanisms from mentors' point of view:
 - b.1. Perceptions about the intervention
 - b.2. Ideas and priorities for future interventions
- c. Contextual factors affecting the intervention and the outcomes

a. Intervention outcomes from mentors' point of view:

a.1. Changes in nursing research culture

Mentors' perceptions regarding changes in the nursing research culture after the intervention were explored. They considered (five out of six mentors) that the research culture changed 'moderately' in their units. Only one of them, working in internal medicine wards, did not perceive any change 'at all'.

The specific changes that they observed differed depending on the contexts. Mentors of oncology areas, where nurses' participation and attendance to JC were high, agreed that the main outcome of the intervention regarding the research culture was that nurses' **attitudes towards research** seemed to be better. They considered that nurses, after the intervention, showed a clear willingness to learn about research, to use it in practice and to do research studies. These nurses even demanded more JC when these were stopped during the summer period. The following quotation illustrates this idea:

M2. Nurses' response and acceptance have been more positive than I expected. They have read the articles before coming to the JC. Nurses talked about research in their work place.

In contrast, mentors of general surgery and cardiology units commented that, although there was a noticeable change regarding **nurses' perception about research**, its importance and their role to develop it, nurses' attitudes were still perceived as too passive and dependent on the mentor's initiative:

M5. I had displayed the articles in the 'notice board' three weeks in advance and nobody took them to read, even the ward manager.

M5. They (nurses) want somebody who gives them the idea and things almost done. Their interest is all talk! They are not willing to read articles or use databases.

One of them pointed out that only a few young nurses were motivated to participate in research activities.

The mentor who did not perceive any change 'at all' felt that the situation regarding nursing research was **worse after the intervention**. Nevertheless, she pointed out that the reasons for this were not dependent on the intervention itself, but on external and contextual factors that had changed in the hospital during the intervention period:

M4. I would say that it is worse now but I think that the intervention was well planned and the difficulties do not rely on it or the implementation process.

a.2. Experience of being a mentor

Another explored theme was the experience of being a mentor. All the mentors agreed that their role was essential for the development of a research culture in the hospital due to the fact that, nurses lack training and research experience. Nevertheless, the experience of being a mentor differed depending on the mentor and the specific contexts.

Two mentors, both working in oncology areas, stated that their experience was **positive** and enriching, as they enjoyed and, learnt how to lead a group and discuss informally about research issues. Moreover, ward managers' and nurses' acceptance and response were good, which motivated them to continue:

M1. I enjoyed the positive acceptance and interest of ward managers and nurses. I realised that it (research) is a need and that nurses are willing to start working on its use and development.

Two other mentors, working in neurology and internal medicine, indicated that their experience was **negative** because it was impossible for them to introduce

any research activity in their wards. They found no support from ward managers and it was never the 'right time' to do anything:

M4. I thought that I could do something, something simple, but always, for one reason or another, the moment to do things was not appropriate and we never could do anything.

As mentors explained, the new policy in the hospital and the staff shortage increased nurses' workload, burn-out and mobility to other services. Due to this situation, and the consequent staff's lack of motivation, mentors felt inhibited to play their role. Moreover, they perceived that nursing research was not seen as a priority. One of them commented that the entire situation was frustrating:

M4. My experience has been negative, or better, disappointing, because I have seen that with the situation in my ward nowadays, it is impossible to start anything. I do not have the 'courage' to go and ask them for extra effort, even though I consider it is important for their development.

The two mentors of cardiology and general surgical wards described their experience as **changing** along the intervention period. When they were invited to participate in the intervention as mentors, they considered it as an opportunity for professional development and to put in practice the knowledge and experience achieved with their Masters' qualification. At the beginning, before the summer, nurses' acceptance and participation in research activities were good and, therefore, mentors felt motivated and enjoyed the experience. Nevertheless, their feeling changed after the summer when the contextual situation of the hospital changed due to the new staffing policy. For instance, three mentors pointed out that several JC had to be cancelled because nurses could not attend:

M5. The last JC could not be done because nurses' workload and impossibility to leave the ward.

Another issue explored was whether mentors' expectations were met during the intervention period. As it happened with the previously explained aspects, mentors' views differed depending partly on the area where they worked and the staff response to the initiatives. Four out of six mentors considered that their expectations were 'moderately met' while for two of them, those were 'not met at all'. Mentors of oncology areas stated that some of the principal objectives, which were to motivate nurses to attend the JC and increase their interest in research, were achieved.

Thus, it seems that mentors' experience and development of their role were clearly influenced by the motivation, acceptance and support received from ward managers and nurses. If they did not perceive this support and interest, they felt that their work was not valued and they lost the motivation and willingness to continue.

b. Intervention mechanisms from mentors' point of view:

b.1. Perceptions about the intervention

One of the aspects explored with mentors was their perceptions about the intervention in general and about the specific contributions of the research related activities run in the hospital, to identify the mechanisms that might explain the outcomes. In general, mentors considered that the intervention was positive for the hospital. From their point of view, the intervention showed that the hospital management had an interest in developing nursing research.

Regarding the specific contribution of the different research activities that took place in the hospital during the intervention period, mentors considered the following:

Journal clubs were considered the most effective activity. They saw JC as a practical and *attractive/catching/motivating* way to get nurses familiar with research and offered the possibility to make research more visible. Mentors' perception was that JC helped to improve nurses' attitudes and knowledge about research methodology and critically appraise a paper:

M5. ...they (JC) had made nursing research closer. They (JC) have helped nurses to know how to interpret a bit better an article. Nurses are able, very quickly, to distinguish a good from a bad article.

They considered JC an opportunity to share ideas and hold discussions, among peers, about daily practice issues and research areas. One of them highlighted that to increase nurses' motivation and involvement in the sessions, it was essential to choose papers with relevant topics for their practice.

The specific contribution of the **RCO** was clearly stated by all the mentors. They agreed that it was essential to establish a basis of research knowledge in nurses before participating in JC, because they did not have enough training to read a

research article. Their perception was that the course was useful and effective to increase nurses' knowledge and motivation. Nevertheless, they also stressed that the impact would have been higher if more continuity could had been achieved on the planned research activities, mainly on the JC.

M5. Nurses who attended the course have more research knowledge now.

M4. I think that it has been a very pertinent initiative. The pity is that nurses could not have more continuity of what they learnt in the course.

Mentors' views about the **work done with ward managers** differed. Regarding the seminar run with ward managers at the beginning of the intervention (WMS), they considered that it was a positive initiative. Its main contribution was the opportunity to share ideas or concerns, and that they saw research as something possible, by working on actions to develop it in the different areas. In other words, from their point of view, the seminar was determinant to start with the intervention and motivate ward managers.

On the other hand, regarding the second initiative planned with ward managers, which was working with mentors on the design and implementation of specific strategies to develop nursing research in the different contexts (based on the seminar's outcomes), most of the mentors' perceptions were not positive. Although, all of them agreed that it was an interesting initiative for nursing research development, the contextual factors, which differed between wards, were determinant. Apart from oncology areas, where there were two mentors, in the rest of units not much work was done with ward managers due to a lack of time, ward managers' lack of availability and interest and, in some cases, to the mentors' lack of motivation:

M6. In my experience, the work with ward managers has been limited or null. One of them shown from the beginning a negative attitude, she was reluctant to receive external help because she felt self-sufficient. The other ward manager did not have time to meet me.

A view shared by the two mentors working in oncology units was that it was very enriching for them to work with ward managers on research development, this being an opportunity to discuss issues about areas and gaps for future studies. Nevertheless, other three mentors who, at the beginning of the intervention, hold meetings establishing specific objectives with ward managers, indicated that it was frustrating for both, mentors and ward managers, to see that those could not be achieved.

b.2. Ideas and priorities for future interventions

Taking into account the main outcomes achieved through the intervention and the mechanisms that, according to their views, had an influence, mentors were asked about aspects or activities that they would have done differently for the development of the nursing research culture in their units. Their ideas can be summarised in four headings: a focus on nurses who are motivated; nursing managers' role; mentors' involvement and confidence; and time.

Some of the mentors insisted on the importance of being careful to **focus the effort on those nurses who are really motivated**. They perceived that when in a group there were nurses perceived as burned-out or not motivated, that had a negative influence on the rest of the group.

Regarding the **nursing managers' role**, they agreed that the hospital management should re-think if research development is a clear priority in the hospital and introduce facilities. The contextual changes, mainly the new human resources policy, had impeded some of the intervention activities to be set up.

Another aspect was the **mentors' involvement and confidence**. From the point of view of mentors, not only was nurses and ward managers' motivation perceived as important, but also their own willingness and involvement with nursing research were determinant. However, there were some differences between mentors regarding their degree of involvement with the intervention. Three of them mentioned that they considered that they could have carried out more activities, but the lack of ward managers' support made them lose their confidence and willingness. In addition, one of them highlighted that her degree of involvement was not enough due to changes in her personal life which, together with the lack of ward managers' and nurses' motivation, influenced her negatively:

M5. ...I think that my personal circumstances have also influenced. When I new I was moving to another country I washed my hands of the whole theme, also because those supposed to be interested (nurses) showed no signs of life or of interest. I had two JC nobody attended.

In addition to this, another mentor stressed that the fact that she was unknown by ward managers and nurses of the unit impeded, to some extent, her role as a mentor. She suggested that it was an important facilitator to have informal

relationships, previously established, between mentors and the unit staff, as it was the case with the rest of the mentors.

Another idea that arose from mentors' answers was that the **lack of time** had been determinant. They pointed out that they did not have enough time to develop their role, prepare sessions or meet ward managers:

M1. To dedicate more time to nurses in their units would have given me more specific knowledge of their needs and worries and I would probable found more informal ways to help them to use research.

In addition, mentors highlighted that the lack of time also affected nurses as they did not have the possibility to participate in some of the research activities.

Mentors were asked about actions that they considered should be given priority in the hospital for the development of nursing research. Mentors agreed that, although during the intervention year not all the expected outcomes were achieved, it was essential to continue with the initiatives already set up, concretely with those that had shown a clear contribution to the research culture development: **JC and research training**. Mentors' pointed out that it was preferable to focus on improving these simple activities, conscientiously planned and already introduced in the hospital, than on establishing more complex and, at the same time, unachievable objectives.

M5. From my point of view, no wider objectives should be set. I think we should continue with JC and research training.

Another initiative seen as a priority, and already introduced in the hospital due to the intervention, was the **mentors' network**. From their point of view, the mentors' role was essential to support ward managers and nurses in research activities. Therefore, mentors suggested that their role should be further defined, explored, developed and supported in the hospital.

Finally, mentors stressed that one of the principal aspects that should change to develop nursing research in the hospital was that nursing managers should create **real opportunities** for mentors to do research and develop their role. They mainly referred to time, highlighting that this time should be real, established a priori, and not dependent on the workload:

M4. To me the priority is very clear: nursing management has to make clear their position and decide if they want to develop a nursing research culture or not. If yes, they have to facilitate it somehow. To start, with real time.

c. Contextual factors affecting the intervention and the outcomes

A theme that arose from mentors' comments, and that has been already stressed several times, was that the contextual factors were conditioning the intervention and its outcomes. In this study contextual factors include: 1-general contexts: the hospital and the wards, and; 2-personal characteristics of nurses, ward managers and mentors (see methodology and Table 2.1, p.49).

Contextual factors determined the intervention impact, in fact, mentors' ideas and priorities for the future, mainly made reference to contextual factors that should be addressed or modified (see section above).

Regarding the general contexts, mentors mentioned that a change in the hospital human resources policy had impeded many of the initiatives to be set up as it lead to workload, staff shortage and a lack of time and impossibility to participate in research activities. Besides, the new situation regarding staff issues made them feel disappointed and not motivated towards research.

M4. ...now nurses cannot do anything but running and running. Before, at least every now and then, they prepared a session. Now, even this cannot be done.

Moreover, this new situation in the hospital supported the idea that research was not a priority because no facilities were provided. This indicates that in this context there is a lack of a research culture.

In addition to this situation that affected the whole hospital, there were some differences in the outcomes: changes in the research culture, mentors' experience and perceptions, depending on the units and the personal characteristics of the staff, managers and mentors. As already commented, mentors working in oncology units perceived more positive outcomes mainly because nurses were highly motivated and responded positively to the activities organised. In these units, also ward managers' initiative, interest and support were crucial. Moreover, mentors' personal characteristics, like demographics, research profile and experience seemed to have a clear influence.

Therefore, it could be concluded that contextual factors referred to personal characteristics and to the general contexts, seemed to be determinant in the intervention outcomes and should be considered for future interventions.

2.3.4. Summarising ward managers', nurses' and mentors' views

In this study, data from different sources or key informants (CN, WM and M) was gathered, and therefore, it was possible to have a more comprehensive picture of the situation regarding nursing research in the hospital. Table 3.35 summarises the principal aspects and the similarities and differences on participants' perceptions.

As WM and M agreed, the research culture changed moderately after the intervention, mainly regarding nurses' attitudes towards research. Their views were supported by quantitative findings, as nurses' attitudes increased significantly after the intervention, even on nurses that did not participate in the planned activities.

Regarding the different activities implemented in the hospital during the intervention period, both, M and WM, considered that the most effective were the JC because they helped nurses to get familiar with research methods and see its relevance for practice. This perception was supported by clinical nurses. Those nurses that attended JC stressed that it was helpful for them to understand research. All of them, M, WM and CN, highlighted the key importance of selecting a paper with a topic relevant for their practice.

WM and M commented that they perceived an increase on nurses' knowledge due to the research course, which was considered an adequate activity, and the JC. This increase on nurses' research knowledge and skills was not exclusively a perception, as the quantitative analysis indicated that those increased significantly after the intervention and that this increase was maintained along the whole year.

Regarding the contextual factors, the political changes and the new human resources were highlighted as determinant by both M and WM. All of them

stressed that their intervention was well planned and a good initiative. However, the circumstances changed completely in the hospital due to staff shortage and a lack of stability. This was also supported by nurses as they indicated that the facilitators decreased along the intervention period.

Table 3.35 Similarities and differences on CN, WM and M perceptions

Perceptions	Similarities	Differences
Research training	After the intervention, all WM and CN stated that they wished to receive more research training.	The focus of the research training differed among participants. WM perceived the need to receive more preparation about general and practical aspects related to the development of a nursing research culture in the hospital. CN demands were more specific and focused on the development of research skills.
Nursing research culture	After the intervention, a moderate change in the nursing research culture was perceived by all the M , but one, and by more than half of the WM .	Nearly half of the WM stated that they did not perceive a change in the nursing research culture.
Nurses' attitudes towards research and motivation	WM and M identified a change in nurses' attitudes towards research. They stated that those attitudes were better after the intervention. This perception is supported by data obtained directly from CN . Their attitudes were better after the intervention and they considered that research was essential for nursing profession.	M perceived that the change of attitudes in CN was not homogeneous in all the hospital wards. They identified differences between contexts, and also depending on nurses' personal characteristics, mainly their age. Some M highlighted the passivity of nurses regarding research activities.
Research knowledge and skills	WM and M considered that nurses' research knowledge and skills improved with the intervention activities. This is supported by objective data obtained from CN . The vast majority of WM and CN considered that they lacked research knowledge to carry out different research activities.	After the intervention, research knowledge and skills improved significantly in intervention nurses while no significant changes were identified in control nurses.

Table 3.35 (Continued)

Perceptions	Similarities	Differences
Intervention	The three groups of participants stressed that the intervention was well planned and an adequate initiative to develop clinical nursing research in the hospital.	
Journal clubs	<p>M, WM and CN considered JC as the most effective activity because it was an opportunity to learn and share ideas among peers, increasing their research awareness and motivation.</p> <p>The three groups of participants stressed the importance of choosing adequate papers relevant for clinical practice.</p>	
Research course	<p>M and WM considered that the research course was essential and that it contributed to increase nurses' knowledge. This was supported by statistical results as CN research knowledge improved significantly after the course.</p>	<p>CN highlighted that, in addition to an increase in research knowledge, the course was important for their awareness and motivation.</p> <p>Although the research course was planned for CN, WM demanded research training and it was also delivered with them.</p>
Ward managers' seminar	<p>M considered that it was essential as a start to develop the nursing research culture in the hospital. It was very helpful to think about specific actions that could contribute to increase clinical nursing research.</p> <p>After the seminar, WM had more positive expectations regarding the possibility to develop nursing research in hospital wards.</p>	
Mentors' network	<p>M and WM considered it a very positive initiative to develop nursing research in hospital wards. This was supported by CN, who stressed the need for research experts' support.</p>	<p>There were differences in M perceptions and satisfaction with their role, mainly influenced by the support and interest received from WM and CN.</p> <p>WM considered that the personal relationship with M was determinant.</p>

Table 3.35 (Continued)

Perceptions	Similarities	Differences
Contextual influences	From WM, M and CN point of view the contextual factors were determinant in the intervention outcomes.	CN perceived more barriers to participate in research activities after the intervention. WM and M also identified more difficulties due to changes in the context.
Mechanisms	WM and M perceived different mechanisms that influenced the intervention outcomes and were able to provide concise and practical recommendations for future interventions.	

Chapter 4. Discussion

Introduction

This project was undertaken to study the promotion of nursing research development in a clinical setting through the implementation of an intervention based on a comprehensive understanding of the context. This research study comprised three phases: baseline, development and evaluation. The methodology used: realistic evaluation, proved successful in achieving the projects' objectives, identifying, in the baseline phase, the determinant characteristics of the context for nursing research development and gaining a comprehensive understanding of the intervention mechanisms and outcomes in the evaluation phase.

This chapter will start by identifying the strengths and acknowledging the limitations of the design and methodology; then, findings will be reviewed and discussed, identifying the key aspects of the intervention design and its results. In accordance with the realistic evaluation framework, discussion of findings will be structured around the concepts of contexts, mechanisms and outcomes in nursing research development.

The discussion of the findings will show that the aims of the study have been met. This thesis set out with the intention of exploring the nursing research culture of a hospital; the determinant factors, barriers and facilitators, for its development; and the potential differences between the hospital wards (objectives 1-3). The study of the nursing research capability and research related activity in the hospital, including the views of nurses and ward managers of the hospital wards, and using different methods, were important in achieving these objectives.

Another section of the discussion of the findings (section 4.2) aims to help to understand the design of the intervention and its implementation in the hospital (objectives 4 and 5). The section will explain the results or outcomes achieved through the intervention by providing insights into the contexts and the mechanisms (objective 6) and ideas for future interventions and research in this area will be provided. Finally, the appropriateness of realistic evaluation methodology for the study of the implementation of complex interventions (objective 7) will be analysed in the following section of the discussion where a methodological critique will be included. At the end of the chapter, recommendations for policy making, clinical practice, nursing education and further research will be given.

4.1. Methodological discussion

Realistic evaluation, as predicted in the methodology, has proved to be a useful design to evaluate complex interventions. As several authors have recognised, evaluation studies of complex interventions should include rich information about the intervention design, implementation, outcomes and contexts to have the possibility of providing comprehensive accounts of its impact and adequacy (Oroviogicoechea 2008; Rychetnik et al 2002; Stead et al 2002). The realist evaluation approach offers a framework for this because it aims at 'describing how and why a complex intervention did or did not work' (Byng et al 2005, p.72) acknowledging the significance of the context in the outcome (Pawson and Tilley 1997).

In this study, the baseline phase conducted to understand the nursing research culture in the hospital was useful for the design of the intervention based on a previous understanding of the context. The relevance of the baseline knowledge in evaluation studies was already highlighted by the pioneers of realistic evaluation (Pawson and Tilley 1997). The intervention designed in this study has the strength of being well supported by a comprehensive baseline phase that allowed a good understanding of the setting, crucial for this kind of strategies to introduce research in clinical practice (Le May et al 1998). In this project, the relevance of the context and its impact on the intervention implementation and outcomes has been clearly shown, supporting the appropriateness of this methodology for evaluation studies.

The realistic evaluation design looks at the relationships underlying variables classified into contexts (C), mechanisms (M) and outcomes (O) (Kazi 2003; Pawson and Tilley 1997) and constructing CMO configurations to explain phenomena. In this study, the classification of variables was done theoretically (Table 2.1, p.49). The contexts included individual and general issues such as, the wards or nurses' demographics and academic profiles. The mechanisms were the intervention activities and the outcomes, the research capacity (through the nurses' research capability (RC) and the influencing contextual factors) and the research related activity (RRA). This classification led the study analysis and was useful to provide detailed accounts of the results. Nevertheless, it is important to recognise that this classification could be different depending on the study objectives (Oroviogicoechea 2008; Kazi 2003; Pawson and Tilley 1997). For instance, there are outcomes for the present study, attitudes and research knowledge, that could well be mechanisms for another study where the ultimate outcome of RRA would be measured. However, due to time limitations, in the present study, the ultimate outcome RRA, was not completely measured as this was considered a long term outcome that could not happen during the study. Therefore, the principal outcomes of this study were those included in RC: attitudes and research knowledge and skills. The realistic evaluation is a methodology that offers the possibility of refining the classifications of variables and the CMO configurations in further studies.

The design of the study was quasi experimental: there were control and intervention groups of nurses but not randomisation (Polit and Beck 2008; Cormack 2000). A pure experimental design was not possible because the intervention was implemented in the whole hospital and the participation was voluntary. All nurses of the hospital were invited to participate in the intervention and those who decided to take part made up the intervention group.

A strength of this investigation was the inclusion of different key groups in the sample: clinical nurses and ward managers; and mentors in the evaluation phase, as it was helpful to understand the culture of the organization and the outcomes of the study. The inclusion of different stakeholders is a key feature of realistic evaluation to offer a comprehensive understanding of the phenomena under study (Pawson and Tilley 1997). There were several limitations regarding sampling. In the baseline phase, the sites for the study were hospital wards with similar features of staffing issues, workload, characteristics of the work and work

organization; and nurses and ward managers working there, were included in the sample. The inclusion criteria assured that the sample was representative of the target population. Nevertheless, a year later, when designing the intervention, structural changes occurred in the hospital management. A new area, 'the nursing research development and innovation area' (NRDA), led by the former nursing manager, was created with the aim of promoting nursing research development in the hospital. Therefore, the intervention designed in this study was implemented in the whole hospital. This is the reason why the sample in the last two study phases, intervention and evaluation, was different to the baseline sample, including some of the intervention nurses who did not take part in the baseline phase of the study. To overcome this potential limitation, data were collected from the new incorporated nurses before they participated in the intervention activities to have the baseline information and to be able to evaluate the intervention outcomes. Moreover, due to the structural changes in the hospital management, there was an important instability in the staff, which had an influence in the sample at the evaluation phase. During the study, it was decided to exclude the ICU from the intervention. The two main reasons for this were that they have completely different characteristics in work organization, making it difficult to implement the intervention and compare outcomes with hospital wards; and that, ICU already had research activity and they did not need any extra support.

A characteristic of this study, that could be considered a limitation, is that it has been carried out only in one hospital with specific characteristics which differ from other hospitals. Nevertheless, as in this investigation it was planned to intervene, close collaboration between the hospital and the researcher, and support from the hospital management to implement the intervention and to continue with it, were required. Therefore, the decision was to do the study in a setting that made the project feasible. Although this could be seen as a limitation, it is important to highlight that the realistic evaluation method provides a framework to develop generalizable results about how the mechanisms of an intervention worked in the specific contexts (Byng et al 2005; Kazi 2003; Pawson and Tilley 1997), because it provides detailed descriptions about the mechanisms of the intervention, the contexts and the interactions between them (Rychetnik et al 2002). This deep understanding of 'how and why' an intervention did or did not work in the specific contexts contributes to the transferability of the results to other sites.

The complexity of some phenomena requires more complex research designs, with combination of methods, to be captured (Creswell and Plano Clark 2007; Giddings and Grant 2006). The use of mixed-method techniques to expand the scope of, and deepen their insights from, the studies is increasing in nursing research (Creswell and Plano Clark 2007; Sandelowski 2002, 2000). The purpose of mixed-methods studies includes triangulation, complementarity or development (Sandelowski 2002, 2000; Greene et al 1989). As explained in the methodology chapter, different data collection methods, which included qualitative and quantitative approaches, were used to collect the information required in this study. The main purpose was complementarity, in other words, to clarify and obtain a more comprehensive understanding of the results. Table 4.1 summarises the data collection methods and instruments used for each group of participants, as well as, the specific moments in which they were used.

Table 4.1 Data collection methods, instruments and times

Group of participants	Method	Instruments	Time
Clinical Nurses	Survey	Questionnaire (NRQ)	T0
		Questionnaire (NRQB)	T3
		Research Knowledge objective test	T1,T2,T3
		Facilitators and barriers scale	T1,T2,T3
		Journal club questionnaire	T1,T2,T3
Ward Managers	Focus groups	Questioning route for focus groups	T0
	Survey	Questionnaire (WMQ)	T0
		Questionnaire about barriers and facilitators	Before & after WMS
		Questionnaire with open and closed questions	T3
Mentors	Survey	Guide to collect data from journal clubs	Intervention
		Diary	Intervention
		Questionnaire with open and closed questions	T3

T0 baseline phase; T1 immediately before the RCO; T2 immediately after the RCO; T3 12 months after the RCO and JC

As explained in detail in the methodology chapter, all the instruments were carefully designed, following the steps for rigour indicated in the literature for the different kind of methods and instruments (Polit and Beck 2008; McColl et al 2001; Jackson and Furnham 2000; Morgan and Krueger 1998). With the vast variety of instruments used in this investigation it was intended that all the required information was properly addressed. For instance, in the baseline phase, the instruments were orientated to obtain general information about the nursing research culture in the hospital, focused on the RC, RRA and the influential factors. In the evaluation phase, different instruments were designed to

determine the intervention outcomes which were longitudinally measured along the study.

In this section, an instrument developed in this project, the NRQ, requires special attention because of its contribution to previous questionnaires. The NRQ measures the nursing research culture, taking into account three main concepts that emerged from literature review and experts' opinions: nurses' research capability (RC), nursing research related activity (RRA) and the influential factors for research development. One of the contributions that this instrument makes to previous instruments is that the NRQ offers a more comprehensive view of the issues under study. For instance, it allows a better organisational-level understanding of nursing research, which was not possible with other instruments mainly focused on nurses' individual characteristics (Bryar et al 2003; Bjorkstrom and Hamrin 2001). In addition, it provides an overview of nurses' research related activity and not exclusively of research utilization, as previous instruments did (Kajermo et al 2001; Parahoo and McCaughan 2001; Parahoo 1999, 1998). Another characteristic of the NRQ, comparing with other similar instruments found in the literature (Hommelstad and Ruland 2004; Hutchinson and Johnston 2003; Parahoo and McCaughan 2001), is that it offers the possibility of studying the factors influencing nursing research from a more positive perspective, looking at the facilitators together with the barriers.

Regarding the measurement of nurses' attitudes towards research, in addition to an open-ended question, the NRQ included a 17-item Likert scale. This scale was designed taking into account previous studies and instruments, as well as experts' opinions (Ax and Kinkade 2001; Clifford and Murray 2001; Hicks 1996). Therefore, the NRQ provides a validated and comprehensive scale for measuring nurses' attitudes. This scale has been divided into three subscales according to its factors, identified through factor analysis. These factors were: 'research relevance'; 'value of research for nurses' and 'nurses' characteristics'.

Another feature of the NRQ is that it contains open questions, which was very useful to gain insights into nurses' perceptions and attitudes towards research. Previous studies mainly followed quantitative approaches (Bryar et al 2003; Kuuppelomaki and Tuomi 2003; Kajermo et al 2001) which offered a limited understanding of the issue. This instrument gives the possibility of a more holistic

understanding of the nursing research culture. Therefore, the NRQ overcomes some of the limitations identified in previous instruments.

A methodological issue that could be considered a limitation of the study is that nurses' attitudes were not measured equally in control and intervention nurses; therefore, the intervention impact on attitudes could not be determined based on their measurement. The decision was made based on the fact that attitudes in control nurses were already very positive, therefore, we expected that the attitudes towards research of intervention nurses, who were willing to participate in intervention activities, would be already better, and therefore difficult to find a difference in them after the intervention. Nevertheless, nurses' attitudes were assessed with other methods, such as, through open questions and other questions of the questionnaire, and by mentors' and ward managers' reports.

The response rates obtained in the two surveys conducted in this study with nurses were high, and this could be explained due to the approaches used for data collection and the involvement of ward managers in the process. The data collection approaches differed in the baseline and the evaluation phases. In the baseline phases, nurses came to a room to complete the instrument; an approach with many advantages (good response rate, answered by the adequate person in the same circumstances) (McColl et al 2001; Fink and Koseccoff 1998). However, due to management structural changes in the hospital, in the evaluation phase it was not possible for nurses to leave the wards and questionnaires were posted to them. Nevertheless, to try to get a good response rate and avoid data contamination, personalised envelopes were prepared for nurses and ward managers' collaboration was asked. When relying on self-reports, it is important to consider the possibility of obtaining socially desirable responses, especially in questions about attitudes, opinions and interest (McColl et al 2001; Fink and Koseccoff 1998). Trying to avoid this, nurses were informed about the confidentiality of their answers.

Regarding the use of focus groups, several potential disadvantages, which could be partly avoided with an adequate groups' composition, have been recognised. In this study, the process for groups' composition (explained in the methodology chapter) has been carefully designed taking into account the literature recommendations regarding the size, the homogeneity and heterogeneity between and within groups, and strangers or acquaintances effects (Krueger and

Casey 2000; Morgan and Krueger 1998). In this project, the fact that the moderator knew all the participants in advance had its advantages and potential disadvantages. For instance, this knowledge was very helpful to decide the groups' composition based on common criteria. The potential disadvantage was that some ward managers could feel intimidated by the researcher. However, the real effect was the opposite, participants felt more confident and comfortable, as the researcher was not working in the hospital and there was not direct professional contact.

Nevertheless, during the focus groups' discussions, some challenges were detected as in some cases, the groups' composition seemed not to be the most adequate and some felt intimidated to talk in front of their colleagues. This is an effect widely highlighted in the literature (Krueger and Casey 2000; Morgan and Krueger 1998). In this study, to minimise it, after the focus groups, a questionnaire was given to participants asking for any additional information (among other questions), and, the possibility to hold an individual interview was given to ward managers, in case they wished to make any further comments. Anyone made use of that opportunity. Another aspect to recognise is the fact that the moderator was a novice using this method for data collection and this could have an effect on the data quality (Polit and Beck 2008; Pope and Mays 2006; McLafferty 2004; Amezcua 2003a; Denzin and Lincoln 2003; Pope et al 2002). To minimise this effect, several steps were followed: a carefully designed questioning route was elaborated and reviewed by experts on focus groups; a pilot focus group was run and recorded to face in advance the challenges of the method and improve skills; an assistant, with experience in focus groups, participated in all the sessions doing a summary and asking additional questions, when needed. The recommendations given in the literature to enhance the validity and reliability of the data were taken into account (Polit and Beck 2008; Pope and Mays 2006; McLafferty 2004; Amezcua 2003a; Pope et al 2002; Krueger and Casey 2000).

As already explained, some qualitative data obtained through focus groups and questionnaires were included in this study. This was a gap found in previous research, mainly focused on quantitative instruments (Veeramah 2004; Díaz et al 2004; Davies et al 2002; Parahoo and McCaughan 2001; Parahoo 1999, 1998) and the approach followed in this study was helpful to understand better the nursing research culture in the hospital and offer more in depth and

comprehensive explanations of the outcomes achieved after the intervention; the aim of any realistic evaluation study, which interest does not exclusively rely on whether an intervention works, but also on the reasons for this (Pawson and Tilley 1997).

A strength and contribution of this project has been that the hospital characteristics have been studied and taken into account when planning and implementing the intervention. This was one of the main gaps found in previous research, as most of the studies did not take into account the whole organization and its characteristics when looking at nursing research activity (Matínez Riera 2005; Clifford and Murray 2001). Davies et al (2002) stated that the working environment was a crucial determinant to nurses' participation in research. Whether nurses are involved in research activities is not exclusively dependent on their individual factors or capability. There are other general factors: organizational issues, support from managers, resources and the existing research culture; that do have an impact (Rycroft-Malone 2008; Pepler et al 2006; Martínez Riera 2005; Pravikoff et al 2005; Gerrish and Clayton 2004; Adamsen et al 2003a; Bryar et al 2003; Melnyk 2002). In this study, the contexts characteristics have been considered and shown to have an impact on the RRA (this will be further explained in the following sections of the discussion).

The period for the implementation of the intervention was one year. This time was considered adequate to see its impact on the RC; however, it was not possible to evaluate the ultimate outcome, RRA. The RRA was considered a long term outcome and it is not easy to estimate the time needed to see an increase in it. Nevertheless, the intervention activities will continue in the hospital, with the new NRDA; and, the RRA will be measured in future studies. As it will be further explained in subsequent sections, some changes were identified in RC after the intervention, which has been showed to be statistically related to the RRA. Therefore, the ultimate outcome of increasing RRA is expected to occur, if the other contextual factors are the same. The fact that the evaluation of the intervention has taken place at three different times has been useful to perceive, not only if the intervention has had the expected impact on the outcomes, but also to understand the tendency of the change one year later and whether it was maintained after a reasonable period of time.

A limitation of the study has to be recognised in the sample size at T3, which decreased considerably. This was due to staffing issues and instability, reflecting the real situation in the hospital. An aspect to stress here is, the overall positive impact in the RC achieved after the intervention considering the contextual changing situation.

4.2. Main results

4.2.1. Contexts

The person, the unit and the organization have been considered as aspects to take into account when studying the intervention implementation and its outcomes. Personal characteristics have been considered in previous research, however, those, together with the general contexts, units, organization, barriers and facilitators; have been rarely explored.

A novel approach used in this study has been that issues regarding nursing research, RC and RRA, have been considered from nurses' and ward managers' points of views, which was helpful to better understand the situation in the hospital and plan an appropriate intervention.

a. Personal characteristics

Personal characteristics of participants included demographics and professional and academic-research profiles. The literature points out that the personal characteristics, or the characteristics of the nurse in terms of Roger's model 'Diffusion of Innovations' (Roger 1983), had an essential role in their research activity (Funk et al 1991). In this study, this tendency has been observed. Most of the nurses' personal characteristics are shown to be related to the study outcomes, RC and RRA.

Regarding the relationship with RC, results indicated that the new generations of nurses seem to be more prepared for and hold more interest and positive attitudes towards research. A similar tendency was found in the study conducted by Sheldon et al (2004). This might be explained by the cultural changes in the Spanish context, where research is being paid more attention to (Martínez Riera 2005; Díaz et al 2004; Gastaldo et al 2001; Moreno-Casbas et al 2001). Also, the

fact that the sample was exclusively composed of females, who traditionally had other priorities than their professional development, may have influenced the lack of research development. The cultural changes in the younger generations regarding women's professional involvement could also be observed in this study.

Nurses' demographics and professional profile also were related to the RRA. While younger nurses tended to have a more active role in the use of material resources, for the remainder of RRA, those nurses with more years of professional experience and, a stabilised working situation, participated more in RRA. This could be explained because more experienced nurses have more authority to decide to introduce changes in their daily practice or more support to attend conferences. Nurses with more years of professional experience would also have had more opportunities to participate in different RRA.

However, in the final model developed through path analysis (Figure 3.15, p.141), when looking at all the variables together, the only personal characteristic that had an impact on the study outcomes was the research training (the academic-research profile), and this was the reason why the intervention was principally focused on it.

b. General contexts

b.1. Organization's characteristics

As previous research has stressed, the characteristics of the organization and its culture are important aspects to consider when studying how to develop nursing research (Cummings et al 2007; Davies et al 2002; McCormack et al 2002; Melnyk 2002; Melnyk et al 2000). In this study, it has been found, in terms of Schein's theory (1992), that the organizational culture of the hospital has a prevalent orientation towards *doing*, instead of towards *being*, which does not facilitate nursing research development. Scott-Findlay and Golden-Biddle (2005, p.359) already postulated that 'organizational culture shapes the research use of practitioners by providing a context where particular ideas, activities, or events are more highly valued than others'.

Despite the fact that previous authors have postulated the relevance of the context in research development (Cummings et al 2007; Scott-Findlay and Golden-Biddle 2005; Schein 1992), most of the research until now has mainly taken an individual approach in the study of nursing research (Scott-Findlay and Golden-Biddle 2005; Olade 2004; Veeramah 2004; Adamsen et al 2003ab; Olade 2002; Ax and Kincade 2001). This has been overcome in this study as we have looked at the whole organization and the influential factors. The fact that the setting of this study was a University hospital and the creation of the NRDA are important contextual factors influencing the study outcomes.

Other important contextual factors that shown a clear influence on the intervention outcomes was the introduction of the new human resources policy that took place in the hospital during the intervention period, changing the context completely. This situation of change and instability has had an impact, in this case negative, on the outcomes.

b.2. Influential factors: barriers and facilitators

Previous studies about nursing research have widely documented the barriers for research utilization in practice (Pravikoff et al 2005; Hutchinson and Johnston 2003; Parahoo and McCaughan 2001). In this study, we aimed at identifying not only the barriers for research utilization but also for other RRA such as, undertaking research studies or using material resources. Moreover, in this study we included ward managers' and nurses' views, as both play an essential role in research development. It is interesting to highlight that, although a different approach was used for data collection, focused on both facilitators and barriers, and that the situation in Spain is rather different to other countries', the perceived barriers and facilitators from nurses' and ward managers' points of view were similar to those previously shown in the literature (Atkinson et al 2008; Profetto-McGrath et al 2007; Pravikoff et al 2005; Hutchinson and Johnston 2003; Parahoo and McCaughan 2001; Retsas 2000; Rodgers 2000; Parahoo 1999; Retsas and Nolan 1999), being the same as the ones identified in a Spanish study conducted by Díaz et al (2004). In this project, for nurses, the lack of time, knowledge and authority were the most important inhibiting factors for research development, and the ward managers' support, the availability and accessibility to material resources and information were the most important identified facilitators (Hommelstad and Ruland 2004; Hutchinson and Johnston 2004; Sams et al 2004; Bryar et al 2003; Parahoo and McCaughan 2001; Kajermo et al 2000;

Retsas 2000; Retsas and Nolan 1999; Dunn et al 1998). For ward managers, the important factors for research development were similar although they identified a few more, such as the staff motivation, the organization of the work, the visibility of research and its impact on practice, and the culture of the organization. An important aspect to highlight regarding the lack of time is that for some of the ward managers, it was not perceived as a real barrier but an excuse and when there was the possibility for spare time, nurses prefer to do other activities rather than use the time to do research, allegedly, the idea does not even occur to them. This is an issue that should be explored in further research because, although the lack of time has always been identified in the literature as the main barrier for research, there might be other inhibiting factors, not identified yet, and with important potential impact on nursing research development. As other authors have already postulated, it is very important to explore ward managers' perceptions regarding the influential factors for research development (Roxburgh 2006; Hutchinson and Johnston 2004; Parahoo and McCaughan 2001; Hundley et al 2000). The identification through this study of these determinant factors influencing nursing research from ward managers' point of view is quite a novel focus that offers important opportunities for intervention development, as potentially they are key agents in promoting nursing research in a hospital. As Scott-Findlay and Golden-Biddle postulated, 'nurse managers are ideally positioned organizationally to facilitate evidence-based practice and therefore must be instrumental in this clinical practice paradigm shift' (2005, p.359).

b.3. Ward characteristics

The significance of the wards' characteristics has not been properly documented in previous research. In this study, the specific characteristics of the wards regarding the speciality, the number and the type of patients, did not have any impact on the outcomes of the study. Only when a broader grouping of units was made, dividing them into general hospital wards and intensive care units (ICU), important differences were showed, being both outcomes, RC and RRA, higher in ICU. This could be explained by the completely different characteristics of ICU, regarding the rate nurse/patient, the work organization and workload. Moreover, in ICU, ward managers' RC and experience is higher and there are different RRA in place. In the final model (Figure 3.15, p.141), the ward (divided into ICU and general hospital) had an impact on the outcomes.

In the evaluation phase of the study it was found that other contextual factors regarding the wards' characteristics seemed to be also relevant in the outcomes, as oncology areas obtained more positive results during the intervention. Those factors were not studied in depth; however, it seems that they were more related to the positive attitudes of the staff and the ward managers working in those settings. This is an aspect that would need further clarification in future studies.

4.2.2. Outcomes

In the baseline phase, which was aimed at gaining an understanding of the situation and planning the intervention, we looked at nurses' RC, RRA and the influential factors in its development. Therefore, they were classified as the outcomes of the study. Nevertheless, for the evaluation phase, the RRA was not taken into account as the aspects included in this concept are long term outcomes that are not possible to be improved during the intervention time. Thus, the principal outcome evaluated in the evaluation phase of this study was nurses' RC.

a. Research capability

The RC included nurses' research knowledge, skills and attitudes-interest. Previous research has highlighted the need for more research preparation among clinical nurses to participate in research activities (Clifford and Murray 2001; Hundley et al 2000). Results in this study were congruent with previous findings that identified the lack of research knowledge as one of the principal inhibiting factors for research development (McCance et al 2007; Roxburgh 2006; Egerod and Hansen 2005; Pravikoff et al 2005; Olade 2004; Shelden et al 2004; Bryar et al 2003; Olade 2002). Concretely, in this study, 92% of nurses considered their skills and knowledge in research as none to low, and this lack of knowledge was perceived by nurses and WM as one of the most important barriers, which indicates an urgent need for research training.

Regarding participants' attitudes and interest towards research, results were not surprising. Previous research concluded that, in general, nurses hold positive attitudes towards research, but that this was not directly related to an involvement in research activities (Roxburgh 2006; Fink et al 2005; Veeramah 2004; Adamsen et al 2003ab; Davies et al 2002; Parahoo and McCaughan 2001). This study

resembles this, as nurses' interest and attitudes were positive, nurses were aware of research relevance. However, there were other factors that influenced whether this interest in research was translated into an active participation in RRA. These positive attitudes did not mean that they were interested in being involved themselves in research activities, but that they value its importance and support when others do it. Some insisted that they preferred to care for the patient than studying or doing research, so, they perceive both activities separately. It is important to bear this in mind when planning an intervention to develop nursing research. The focus should be broader. Instead of looking exclusively at nurses' general attitudes, which already have been shown as positive, we should try to identify those nurses who are really interested in being actively involved in research related activities and start working with them.

Regarding WM' views, findings were congruent with nurses' statements. Ward managers perceived a clear deficit on nurses' knowledge, skills and motivation to be involved in research activities. Moreover, in this study, ward managers' RC was also assessed as they play a key role in research development and promotion (Bryar et al 2003; Kuuppelomaki and Tuomi 2003; Davies et al 2002). Previous research has not looked at WM skills, probably because they were not considered as active agents in research but as motivating agents, who do not necessarily need high RC to develop their role. However, this study has shown that the RC of WM was a determinant factor for the research culture of the ward. Most of the WM of hospital wards highlighted that their level of knowledge and skills was low and, therefore, they did not feel confident enough to motivate nurses to do research. They need to feel in control to motivate their staff to do things. This was supported by the fact that the only study site found with research activity being conducted, was the ICU, where ward managers have long experience and research training. Therefore, an important finding of this study is that it is not only the nurses' RC that should be promoted in an intervention but also that of the ward managers'.

b. Research related activity

Most of the reviewed literature was focused exclusively on research utilization (Gerrish and Clayton 2004; Hommelstad and Ruland 2004; Hutchinson and Johnston 2004; Bryar et al 2003; Retsas 2000; McSherry 1997). The fact that this study focused on nurses' RRA and not only on research utilization, has been

quite a novel approach that offers interesting insights and a more comprehensive view to understand the real situation regarding nursing research, especially in the Spanish context.

In the baseline phase, quite a low RRA was perceived among clinical nurses in hospital wards. Finding congruent with previous research (Díaz et al 2004; Tanner and Hale 2002). The principal way of nurses' participation in research was to collect data in projects conducted by others (doctors). This trend in nurses' participation in research has been reported in previous studies where nurses indicated that they principally had contributed in data collection in medical research activities (Olade 2003). It was surprising to find that, although nurses' stressed that they were not informed about the research results and no changes in their practice were perceived due to research findings, most of them considered the experience of this participation as positive and a learning activity. In addition, nurses did not have continuity in the use of material resources, rarely attended nursing conferences and less than a half participated in diffusion activities. Therefore, the RRA was the ultimate outcome that should be improved in this hospital and assessed in future studies.

As it was the case regarding contexts and outcomes relationships, the bivariate analysis carried out identified interesting relationships among RC and RRA. The research knowledge, and nurses' interest and attitudes were related to most of the RRA. Further statistical analysis, multivariate analysis, helped to determine the strongest predictors of the RRA. Results, congruent with previous research (Díaz et al 2004; Veeramah 2004; Davies et al 2002; Parahoo and McCaughan 2001) showed that the RC was determinant. The final model developed through path analysis concluded that the determinant indicators of RRA were the research knowledge (outcome), the training (context) and the ward (context) (Figure 3.15, p.141).

Therefore, based on the baseline phase results, it was considered that, if the intervention focused on increasing nursing research capacity by enhancing nurses' RC, especially the research knowledge and skills, through research training; and by modifying inhibiting contextual factors, an impact on the RRA would occur. Some changes could be perceived during the intervention period and others would be longer term outcomes that would need to be assessed in further studies. The evaluation results showed the effectiveness of the

intervention as those nurses who received research training and participated in the intervention activities increased their RC, regarding the research knowledge and skills, while those nurses without research training did not experience any change in it.

An aspect to highlight in the results obtained in control nurses was that, although they did not participate in any intervention activity, their attitudes became more positive after the intervention. This supports the idea of general contexts' influences on the outcomes (Melnyk 2002; Melnyk et al 2000; Closs and Cheater 1994). Something similar was reported in an intervention study conducted by Hundley et al (2000) where an increase in the research capability of control nurses, especially in their knowledge and use of resource, was perceived.

The situation in the hospital during the intervention regarding the support and opportunities created for research development may have influenced staff attitudes. Also, the cultural changes in the context and the explicit interest in the organization for nursing research development with the new NRDA may have had an influence. Moreover, the fact that ward managers were involved in the intervention may have been perceived as positive, as nurses already stressed that this was one of the principal facilitators. Thus, the intervention may have had an extended effect on the whole population of nurses working in the hospital, independently of whether they participated in research activities or not. Ward managers and mentors' reports support this idea as both perceived more willingness and interest in nurses and an improvement in their attitudes towards research after the intervention.

Other interesting findings, regarding changes in the perception of facilitators and barriers during the intervention period in the control group, support the idea discussed above. The most important facilitators were the same but the modification in percentages indicated that the intervention had an effect also on control nurses. For instance, in addition to improving their attitudes towards research, they really perceived that during the intervention they had more support from WM and more material resources availability. However, it is necessary to highlight the fact that half of the nurses commented that they did not perceive any facilitator at all to conduct research activities, and this should be considered when planning further activities. Regarding the barriers, the lack of time increased its percentage as the main inhibiting factor for research development. It could be that as they became more aware of research activities by observing the others,

they wanted to spend time engaged in an activity that they had not considered before to any extent. Nevertheless, it seems that the lack of time included also the workload and organization as the sum of both percentages at T0 is nearly the percentage for lack of time at T3. The lack of knowledge was the second principal barrier and the percentage of nurses who perceived it increased at T3. The reason for this could be that during the intervention, when some of their peers were being trained (intervention nurses), they (control nurses) probably were more aware of the need for more knowledge and training.

However, it should be stressed that, although the above mentioned effects on control nurses, the intervention group of nurses perceived less facilitators at the end of the intervention. This was a surprising finding that could be explained by the contextual changes that occurred in the hospital during the study period. It seems that intervention nurses, who received research training and participated in JC, got frustrated when they noticed that it was not possible to put in place what they learnt.

However, probably the most relevant outcome achieved in this study is that, according to mentors' and some of the ward managers, the culture of the hospital regarding nursing research changed moderately after the intervention. They perceived better attitudes in nurses, a clear willingness for nursing research development in the hospital, more resources and support. This interesting outcome reveals how an intervention, designed taking into account the characteristics of the contexts and implemented in the whole hospital with continuity, during an agreed and appropriate period of time, involving and supporting nurses and ward managers, could achieve this important outcome in a relatively short time, even though the contextual changes have been inhibitory. It would be very interesting to study how this change in the nursing research culture of the hospital evolves and its real impact on RRA.

4.2.3. Mechanisms

Mechanisms in this study include issues about the intervention, its characteristics and how it worked. Nurses' answers to open-ended questions, as well as WM and M reports were used to decide the intervention activities and better understand its mechanisms.

One of the principal aspects that should be highlighted about the intervention, as a mechanisms that helped it to achieve the identified outcomes, is the fact that it has been entirely designed after gaining a profound understanding of the situation in the hospital where it was being implemented. The previous knowledge of the context gained through the baseline phase of the study was essential for the development of an intervention adequate for the specific context.

The intervention was focused on increasing research capacity, mainly nurses' RC. In the baseline phase of the study, a relationship between RC and RRA was shown. Therefore, a development of RC was expected to have an impact on RRA and on the nursing research culture of the hospital. Thus, during the intervention, research training was offered in form of research methods courses and JC. An interesting aspect of the intervention was that the training had a practical approach. The RCO was delivered with the clear focus of showing participants how to apply the gained knowledge when reading a paper and how to translate findings to nursing care. The objective was to show nurses the importance of understanding the evidence and seeing the applicability of research results in their practice. The practical approach of the research courses has been perceived as positive. The content of the course, with the most relevant bibliography and articles, was prepared as a handbook that was given to participants. This was also perceived as very positive to facilitate their comprehension during the sessions and the discussion afterwards.

Another mechanism of the intervention was that the knowledge achieved through the courses had continuity with the JC, (although, due to contextual factors, not as much as planned) which were perceived as an opportunity to discuss, among peers, about how their practice could be develop taking the scientific evidence into account. Thus, the JC had this orientation, choosing articles relevant for nurses' daily practice. This approach was perceived as very positive by participants giving them confidence and showing how important it is for the development of the nursing profession, their cooperation and involvement in the use of the scientific evidence in their practice. Participants and mentors considered JC an effective and attractive way to get nurses familiar with research and offered the possibility to make research visible.

Another mechanism of the intervention is its flexibility to try to adapt to the requirements of the context. Mentors, who were the person in charge of delivering the sessions, were aware of the need for capturing the maximum number of interested nurses and they gave all the facilities for this to occur. The planning of the sessions was carefully done trying to find the most adequate moments for nurses, considering the characteristics and the situation of the ward, and being flexible when, at the very last moment, they had to be modified because of the contextual situation.

The adequate diffusion of the activities, in this case the JC, was also an essential mechanism in this intervention. Monthly, the participants in the research methods course were sent an email indicating the JC that were taking place, the mentors, the articles chosen for the discussion (with a link to access to them), the dates, times and rooms. Moreover, a research corner, with 'eye-catching' posters and the articles printed, was placed in nurses' rooms to facilitate the diffusion of the activity and the creation of a culture of reading scientific papers among nurses, including those who were not participating in the intervention activities.

Although research training activities have been reported in previous interventions (Adamsen et al 2003a; Clifford and Murray 2001; Hundley et al 2000; Dyson 1997), in this study, not only staff nurses, but also ward managers benefited from them, which has proved positive for both. Nurses and ward managers were organised in different groups trying to make them homogeneous, facilitating participants' confidence to actively participate in the sessions. It was important for ward managers to receive the training, not only for the knowledge to be gained, which was not the principal objective with them, but for the degree of involvement with the intervention achieved thanks to it. They really liked the research course and its approach, and understood perfectly their role in motivating and facilitating nurses to attend the intervention activities. At the same time, nurses felt the support they needed from ward managers, which was one of the principal influential factors identified by them for research development.

In addition to the participation of ward managers in the course, reinforcement and remainder meetings were organised with them, the NRDA and the researcher. Nursing managers of the hospital were also invited to those. During these meetings, objective information about the intervention activities, number of participants and preliminary evaluation data, was presented to them. This

initiative was an important mechanism to keep the interest among ward managers and nursing managers, to make them feel as important agents in achieving those results and to insist about the necessity for their involvement and help.

The mentors' network established during this study was a highly valued initiative by nurses and WM because they found the support of research experts, which was stressed by them as one important facilitator for research development. Moreover, the fact that mentors were research trained nurses working in the hospital, some as staff nurses and others in management posts, helped nurses and WM to see that nursing research was not an activity conducted exclusively by academics. Another important mechanism regarding the mentors' network was that it offered the possibility to attend personally to nurses' worries or interests regarding research. In fact, during the intervention, there were several groups of nurses, mainly in oncology areas, who wanted to conduct a research study or implement a change in their practice after critically appraise the evidence in the JC. The support of the mentors was essential to channel these demands properly. Although some of the nurses' ideas were not realistic, the fact that they felt supported and heard by research experts, made them not feel discourage to continue.

The grade of mentors' involvement and their ability to play a leadership role were crucial for the intervention and its outcomes. Mentors received a training course about mentorship. Moreover, meetings with all the mentors and the NRDA were periodically organised to discuss the intervention and issues around it. However, they might have need for more reinforcement in other competencies that have been seemed as necessary to be a good mentor like, communication skills, dealing with difficult situations, motivating a group and being a leader. Moreover, the fact that some of the mentors were working in the hospital as staff nurses, although had positive implications, made it more difficult for them to have time to develop their role, because they needed to leave their shift and this was not always possible or well understood by peers. All these are aspects that should be taken into account in future interventions with mentors.

The creation of the new NRDA in the hospital during the intervention implementation was a key mechanism that indicated the hospital management

interest and support in nursing research development. This facilitated the needed resources, mainly human, to deliver all the intervention activities.

4.3. Contributions of the study

One of the contributions of this research is that it provides a valid and reliable instrument, the NRQ, to understand the nursing research culture in clinical practice that could be used in other studies. The process of the instrument development and analysis of validity and reliability have been rigorously described. Besides, although containing mainly closed-ended questions, it incorporates some open-ended questions that allow uncovering underlying issues for future research and instrument improvement.

Future studies aiming at promoting nursing research in clinical nursing will be able to gather baseline information using the NRQ, which could be of help in the design of strategically targeted interventions for their specific contexts. These contextually framed interventions will be more targeted and, therefore, more suitable to meet their goal of contributing to the development of nursing research activity in clinical nurses (McClearly and Brown 2003; Le May 1998).

This research project provides insights into the nursing research situation in Spain, knowledge that was needed due to the lack of research about this issue in the Spanish context and to the fact that the situation regarding nurses' involvement in research will change with the European Convergence. In addition, this study presents a comprehensive perspective of nursing research by looking not only at research utilization but at other research related activities. This fills a gap found in the relevant literature mainly focused on research utilization in practice (Hommelstad and Ruland 2004; Hutchinson and Johnston 2004; Bryar et al 2003; Parahoo and McCaughan 2001).

This study offers a comprehensive participants' perspective incorporating multiple factors and combining methods. Quantitative data and the multivariate analysis, with the use of path analysis, have clarified significant relationships between variables, analysing effects among contexts, mechanism and outcomes. Qualitative data has contributed to get insights into participants' perceptions which have been extremely helpful to understand the intervention mechanisms.

Another feature of this research, which was extremely useful in obtaining a comprehensive perspective of the phenomena under study, was the incorporation of ward managers' and mentors' views. Ward managers are key agents in research development in clinical areas and therefore, their perspectives in the baseline phase, regarding the existing situation and the influential factors, were essential in the understanding of the nursing research culture. Moreover, having ward managers' and mentors' perceptions in the evaluation of the intervention was essential to understand the intervention mechanisms and outcomes. This is crucial in a realistic evaluation study intended to know not only whether an intervention has worked but to understand the mechanisms that made it work (Pawson and Tilley 1997).

This research demonstrates the potential of realistic evaluation as an adequate approach for the evaluation of complex interventions. Results acknowledge the complexity of the design and implementation of these interventions and the influence of contextual factors. The realistic evaluation seems to be a useful method to uncover the underlying mechanisms that explain how and why the intervention works and achieves the expected outcomes.

Ideas and priorities for future interventions

If we focus on the intervention developed through this project, it could be stated that the most appreciated and effective activities have been the JC and the research course. In fact, all participants, WM, M and nurses, have stressed that they should continue. Other authors already identified the JC as one of the key initiatives to promote research utilization in clinical practice (Larkin et al 2007; Fink et al 2005; Melnyk 2002). Nevertheless, from the point of view and experience of the participants of this study, we have identified some aspects that could be improved:

- 'Interested versus motivated nurses'. Although these research activities should be open to anyone that wishes to participate, it would be interesting to identify those really motivated nurses in participating in research studies and conduct parallel sessions with them. This selection might be done by WM, who really know their staff. It has been shown in this study that most nurses are willing to receive training but not all of them are ready to go further. This differentiation is important to try to take

a step forward and have a group of trained and motivated nurses that could be the 'motor' in their units. Some authors who have studied the research capacity building in nursing schools already differentiated the 'inclusive' (opportunities for everyone) or 'exclusive' (for certain individuals) approaches to research development (Green et al 2008). Both have challenges which should be carefully studied.

- 'Continuity in activities'. It is important to maintain continuity in the JC and other activities to start generating a research culture in the hospital. Sometimes, it is difficult due to other contextual factors that impede this, but it is necessary to be aware of the negative impact that the lack of continuity might have on the outcomes.
- 'Basic and advance groups'. Independently of their motivation, it is important to differentiate their research knowledge level. It could be a good initiative to have different groups regarding their knowledge to avoid discouraging novice nurses or lack of learning in more advanced nurses.
- 'Inclusion of WM in the training'. This has been perceived as essential to increase their confidence in playing their role in motivating and facilitating nurses' participation in research activities.
- 'The language barrier'. It is difficult to find good papers for critical appraisal in Spanish, especially in some clinical areas. Nurses interested in research need to be able to read a scientific paper in English and, for those who do not have the domain, it could be worth to organise an English course focused on reading a paper in English.

In this study, the intervention was mainly focused on increasing research capability. In future interventions, it could be interesting to take a step forward by focusing in nurses' research activities. Some nurses who have participated in this study already have research ideas from problems identified in their practice. It could be a good start to take some of these ideas and develop small research projects with groups of nurses looking at their experience and the impact that they have on clinical practice. Something similar was done in an intervention developed by Clifford and Murray (2001) concluding that it was a good experience for clinical nurses. As WM stressed, it is important for nurses to perceive the value of nursing research in practice to motivate them to be involved in research. To do so, it would be necessary to have the support of research experts or mentors. In addition to the mentors' support, it would be a priority to

establish more formal links with academics, because, at the moment, they are more experienced and research knowledgeable.

The establishment of the mentors' network has been a well valued initiative in the hospital according to both, WM and nurses' perceptions. This was supported in previous studies (Larkin et al 2007; Wells et al 2007; Shelden et al 2004). Nevertheless, the mentors' experience during the intervention clearly differed among them. There are some aspects that could be addressed in future interventions to overcome some of the difficulties found in this study.

- A careful and thoughtful selection of mentors. To do so, it is important to take into account their degree of motivation, involvement and also their personal situation. All these aspects have been shown as determinant in mentors' experience.
- Mentors' training. Mentors are research knowledgeable and experienced. However, it has been clearly shown that there are other abilities needed to properly play their role as mentors. For instance, they should take a leadership role, transmit enthusiasms; and have communication skills and capacity to work in a team. Therefore, they might need to be trained in all these essential aspects.
- Relationship mentor- ward manager- nurses. Good professional and personal relationships between mentors and ward managers have been highlighted as determinant for mentors' experience and the possibility to conduct the different activities. It is very important to clearly establish here the different roles that M and WM have and assure that both agree and understand it. Another key issue that arose in the study has been the appropriateness of mentors being known in the unit, because they are, or have been, part of the staff. In some cases this could help to establish confidence with WM and nurses. However, there might be a conflict of roles, especially when they are a member of the staff. Again, this is something that has to be studied and considered in advance.
- Real time/facilities. The fact that mentors are working in the hospital has been perceived as a positive aspect because they belong to the same context, live similar experiences and really understand WM and clinical nurses' situation. Also, because they are more accessible to ask for support or advice. However, this situation might have some disadvantages. At the beginning of the intervention, it was established a 'study day' for mentors, and they had the approval to spend a day per

week in the library preparing the intervention activities. However, as they were working in the hospital, and in some cases as staff nurses, they were expected by their WM and peers to be 'flexible' and adapt to the workload or unit needs. This led them not to have protected time or facilities to develop their role, making the experience frustrating and distressful.

4.4. Recommendations and implications of the study

4.4.1. Implications for policy making, clinical practice and education

The intervention designed through this study has been the first formal initiative introduced in the hospital with the aim of developing nursing research. It was implemented with the support of the NRDA and the outcomes seem to be promising.

The main findings and conclusions have been presented to those responsible for the development of the research activity in clinical areas. Although this study has finished, the NRDA continues working to promote nursing research in the hospital and to do so, some of the most successful activities included in the intervention, such as the JC and mentoring, will continue in place.

It is essential that policy makers and managers rethink about their priorities, the importance of nursing care for patients and the kind of nursing they want to have in their institutions to maintain change in the research culture of the organization. Schein (1992) already postulated in his theory of organisational culture, that the 'nature of the activity' will influence whether nurses use or participate in research. According to this, there are 'two extreme positions regarding how work is construed and valued, orientated toward *doing* or toward *being*' (Scott-Findlay and Golden-Biddle 2005, p.361). Therefore, in terms of Schein's theory, the managers should consider how they value nurses' work. Nowadays, the prevalent orientation is in *doing*. However, the research activity 'requires time for *being* as it involves reflections, time for accessing, reading and critiquing the

latest studies' (Scott-Findlay and Golden-Biddle 2005, p.362). As Fink et al (2005) highlighted in their research, 'creating an organizational climate that values research use and supports nurses to participate in such activities is crucial to the organization's success' (Fink et al 2005, p. 128)

The implications of this study for clinical practice are important. The interest and positive attitudes of nurses towards research have been highlighted. This is essential because although all clinical nurses do not have to be interested or prepared to actively conduct research studies, it is neither something to do exclusively in academic environments or by professionals in elitist positions (Edwards et al 2002). Ward managers are key agents in identifying those more interested nurses to motivate and facilitate opportunities to participate in research activities. Here, the mentors' role, as research experts, is essential in supporting ward managers and nurses when doing research. Clinical nurses are also in a privileged position to identify questions or aspects of their daily practice that need to be studied and, any nurse, independently of their education, should be critical and reflexive in their practice to identify questions or problems that need to be answered by research (Kim 2006; Egerod and Hansen 2005; Rycroft-Malone et al 2004; Shelden et al 2004). Here, again, mentors' advice could be crucial in shaping or transforming those practical questions into researchable questions.

The aim of nursing research is to generate a body of knowledge that can help to improve clinical practice. This does not imply that all nurses should be researchers but that they need to be aware of research using the evidence to provide patients with the best available care (Jinks and Chalder 2007; Pepler et al 2006; Martínez Riera 2005; Díaz et al 2004; White and Taylor 2002; Clifford and McCaughan 2001). In other words, all nurses should be research consumers. Nevertheless, the fact is that research findings do not really inform nursing practice. This is an idea repeated by participants in this study which supports previous studies' findings (Cummings et al 2007; Pravicoff et al 2005; Scott-Findlay and Golden-Biddle 2005). If nursing research needs to be developed to improve nursing care, then, a real impact on practice has to occur, otherwise, research is not achieving its final objective. Obviously, this impedes managers'/policy makers' support, nurses' willingness to participate and invest time doing research and, ultimately, nursing research to receive funding from official bodies. Once again, mentors' and ward managers' work is essential to develop a culture where research is valued. Moreover, managers' response to

the evidence is crucial, facilitating changes to be introduced in the hospital, if it is the right moment, or justifying the reasons for not doing that.

The implications of the study for nursing education are several. To overcome some of the principal barriers for research development, identified in previous research and highlighted in this study, such as the lack of knowledge and of a research culture, research should be present in nursing education from the beginning. Nevertheless, the research related competencies achieved by students will vary according to the educational level and it is crucial to differentiate clearly these competencies at undergraduate and postgraduate levels. In Spain, undergraduate education is not focused on research competencies; nevertheless, nurse educators need to help cultivate more favourable research attitudes among undergraduate students (Olade 2003). Essential elements such as critical thinking, curiosity, and reflexive practice should be promoted from the beginning of nursing training, showing them the potential relevance of research for their practice and the need of research evidence for decision making, in other words, as other authors have indicated, to show the value for research in practice (Pravikoff et al 2005). This is the way to generate a research culture among nurses, independently their educational level. It would be at postgraduate education, masters and PhD, when nurses would start to achieve the research capability, knowledge and skills, to consume the evidence and generate knowledge by doing research studies.

Therefore, even though research knowledge and skills will be achieved at postgraduate education, a research culture could be created from the beginning, which is a challenge for undergraduate education. As several authors have stressed, basic nursing programs must teach the value of research and EBP (Melnik 2002; White and Taylor 2002; Ax and Kincade 2001). Hopefully, with the current process of the European convergence, through which the approach for nursing education is changing and with the new access for Spanish nurses to postgraduate education, some of these aspects will be addressed.

4.4.2. Limitations and recommendations for future research

This study is subjected to some limitations. The main limitation is that it was conducted exclusively in one hospital. Therefore, results cannot be generalised to the Spanish context (Polit and Beck 2008; Cormack 2000). Although generalisation of results is not possible, the use of a framework, such as the realistic evaluation, that guides the evaluation process, provides the first step in realistic accumulation and makes possible to consider transferability of the results to other cases (Kazi 2003; McEvoy and Richards 2003, Pawson and Tilley 1997).

It will be interesting to have more empirical data to translate experiences from one place to another. Also, replication of the study in other organizations following the realistic evaluation approach will provide further understanding of context, mechanism and outcomes and their causal relationships, redefining and identifying new CMO configurations. In other words, integration of different studies results could help accumulation and theory development (Pawson and Tilley 1997).

Another aspect that should be taken into account to overcome a limitation of this study is the measurement of nurses' attitudes. As it has been explained in the methodological discussion of this chapter, those were not equally measured in control and intervention nurses. It would be interesting to measure them with the same scale or instrument to be able to compare nurses' attitudes in both groups.

Another issue to be mentioned is that the voluntary nature of the sample might have some implications to the findings, as the nurses volunteering to participate in the study might have had an interest in research activity even if they were not actively involved. The drop in sample numbers for T3 has to be also recognised as a potential limitation of this study.

There are several recommendations to improve the validity and reliability of the tool, the NRQ, and its relevance for other contexts. First, it should be further tested being used in different hospitals. Second, it should be used with larger samples and in more studies, because although the pilot work results are promising, the psychometric evaluation of a tool is a cumulative and continuous process that could last as long as the instrument is being used (McColl et al

2001; Jackson and Furnham 2000; Polit and Hungler 2000). The instrument has been developed in Spanish; therefore, its use in other countries could be difficult. Further research could be conducted to translate and adapt it into English to spread its use to other contexts.

Taking into account that the intervention activities designed in this study are expected to continue with the support of the NRDA, further research to evaluate long term outcomes could be conducted. It would be especially interesting to study whether the expected final outcome, the increase of the RRA, does happen and the mechanisms for this. In addition, considering the impact that the context has in the outcomes, and the modifications that the hospital has suffered in this sense, it would be necessary to re-explore the contextual situation before continuing with new initiatives.

Conclusions

The nursing research culture in a Spanish Hospital has been examined in this study in response to a paucity of information about nursing research situation in this context, a pre-requisite for identifying effective interventions to develop nursing research among clinical nurses in Spain and contribute to the improvement of nursing care.

Following the understanding of the nursing research culture in a hospital, this study has designed and implemented an intervention to develop nursing research in clinical nursing. The methodology used for the design, implementation and evaluation of the intervention has been the realistic evaluation, quite a novel methodology in nursing research, which usefulness has been supported in this study. The realistic evaluation approach has proved to be adequate for the evaluation of complex interventions allowing the identification of the mechanisms that made the intervention achieve the outcomes in the different contexts. Therefore, this methodology allows more comprehensive and in depth understanding of the outcomes of the study.

This study used a mixed-method approach to explore the nursing research culture and analyse the impact of the intervention in the hospital. It has looked at clinical nurses' research capability; the research capacity in the hospital or influencing contextual factors, according to ward managers, mentors' and clinical nurses' views; and the research related activity of the hospital. The following Table 5.1 highlights the original contribution of this study regarding the methodological aspects.

Table 5.1 Original contribution of the study regarding methodological aspects

What is already known	What this study adds
In the Spanish literature there were many discursive papers about nursing research and its importance, but no much empirical knowledge.	This empirical study about the nursing research situation in Spain provides some research knowledge that was needed in this context.
Previous studies failed to offer a comprehensive view of nursing research activity. Studies mainly focused on a specific aspect of nursing research: research utilization and its barriers.	This study followed a more comprehensive approach to understand the nursing research culture in a hospital looking at the research related activities, not only at research utilization.
Most of the studies used quantitative approaches in the study of nursing research.	In this study a mixed-method approach was followed to gather holistic information and understand the nursing research culture in a hospital. This study focused on research capability, the research activity, and the influential factors.
Previous studies mostly used the same structured instrument, The Barriers scale, to look at barriers for research utilization/EBP.	In this study a more positive approach was followed focusing not only on the barriers but also on the facilitators. The information was gathered through open-ended questions to capture the relevant influencing factors in the context.
Different instruments were available in the literature but those were mainly structured and focused on research utilization.	A new instrument has been designed to measure research capability, research activity and the influential factors. It contains closed and open-ended questions.
Previous studies focused on nurses' individual characteristics, the research capability, to understand the research-practice gap.	The organizational culture is essential for nursing research. This study has looked at it and showed the impact that the contextual factors have on nursing research activity and its development.
Ward managers are key agents in research development but their views had been nearly ignored.	This study explores, through focus groups, ward managers' understanding about nursing research and their role in the development of research among clinical nursing. Managers played a key role in this study, in the baseline phase and during the implementation of the intervention.
Interventions for research development principally focused on enhancing EBP.	The intervention designed in this study aims at developing the nursing research culture in a hospital by increasing the nurses' research capability and the research capacity.
Interventions have been designed after a review of the literature.	Intervention designed after a literature review, but principally, after an exploratory work that allowed a deep understanding of the culture of the organization and the nursing research situation.
Interventions to enhance research utilization have been mainly focused on clinical nurses.	The intervention designed in this study included clinical nurses, ward managers and mentors in the design, implementation and evaluation.

Table 5.1 (continued)

What is already known	What this study adds
Previous interventions mainly consisted on educational programmes for clinical nurses without taking into account contextual characteristics.	The intervention designed and implemented in this study included a variety of activities for clinical nurses and ward managers: seminars, research courses and journal clubs.
Previous studies do not offer detailed information about the design, implementation and evaluation of the intervention	This study provides detailed information of the design, implementation and evaluation of an intervention, using a realistic evaluation approach.

A relationship between nurses' research capability, the research capacity of the context and nurses' research activity has been shown in this project. Therefore, the intervention designed and implemented in this study, focused on increasing nurses' research capability and research capacity, is expected to help in the development of clinical nursing research.

With the intervention a variety of activities were introduced in the hospital such as, research seminars, courses and journal clubs. All of them have proved to have an impact on nursing research capability and the development of a nursing research culture in the organization. This has been perceived by the different groups of nurses who were involved in the intervention: ward managers, mentors and clinical nurses.

The nursing research culture of the hospital changed moderately after the intervention according to ward managers' and mentors' views, who considered that the intervention was well planned and adequate for the specific context. The intervention achieved its principal expected outcomes regarding nurses' research capability. These outcomes are collected in the Table 5.2 comparing the results in control and intervention groups of nurses.

Table 5.2 Specific contributions of the intervention in research capability

Research capability	Control nurses	Intervention nurses
Research knowledge	Before the intervention: 94% none-low After the intervention: 95% none-low	Improved significantly after the intervention
Research skills	No significant differences before and after the intervention	Improved significantly after the intervention
Attitudes towards research	Positive attitudes that improved significantly after the intervention	Ward managers' and mentors' views: Better attitudes after the intervention.

As it is shown in Table 5.2 all the aspects of nursing research capability improved significantly in intervention nurses. In control nurses, as anticipated, the research skills and knowledge were similar before and after the intervention. However, their attitudes towards research were significantly better after the intervention, finding that supports the idea of the influence that contextual factors might have on individuals' research capability.

The participation of ward managers in the intervention design and implementation has been a novel and positive approach of this study. Ward managers, with the help of mentors, were able to identify specific activities that could be easily introduced in the hospital to develop nursing research. Their expectations regarding nursing research development were modified after the intervention seeing it more feasible. Ward managers manifested a clear wish to continue working and involved in the achievement of a nursing research culture in the organization.

Regarding the research capacity in the hospital, the outcomes were surprising. Several of the detected barriers for research development were overcome with the intervention, such as the experts' support with the mentors' network, and the provision of training with the courses and JC. Besides, more facilities and resources were provided from hospital management with the creation of the new NRDA, which was determinant in the implementation of the intervention. Thus, there were some aspects of the organization that indicated that nursing research was a priority and really valued and supported in the hospital.

Nevertheless, despite the fact that all these initiatives were highly valued by ward managers, clinical nurses and mentors, other extremely determinant contextual changes occurred in the organization and the opportunities for research were compromised. The impact that this new contextual situation had on the outcomes has been highlighted by ward managers and mentors, and supported by the perception, in clinical nurses, of less facilitators after the intervention.

In this research the importance of the contexts in the outcomes has been demonstrated. Therefore, it is necessary to have a deep understanding of the organization characteristics and culture before designing and implementing an intervention. In fact, in this study, although the contextual factors were explored a priori, since important changes occurred along the intervention period, it would be

necessary to re-assess the existing situation and make an 'adjustment to the new context' determining the new real possibilities and facilities. Otherwise, the planned initiatives might not be further adequate for the context. This assessment should be a continuous process as the health care organizations are dynamic contexts.

Other hospitals interested in developing the research activity among clinical nursing could benefit from the knowledge achieved in this study. This thesis has provided detailed information about the impact of an intervention contextually framed from a comprehensive perspective that allows an understanding of *how* and *why* it has worked in a specific context. This profound understanding of the whole process contributes to the transferability of the results, providing detailed information about the mechanisms of the intervention, the context in which it was implemented and the interactions between them.

In conclusion, considering the results of this study, it could be said that the planned intervention has been an adequate initiative for the hospital because it has contributed to the development of the nursing research culture in the context. This is expected to have an impact on nursing research activity that would improve the quality of nursing care through the incorporation of research evidence in their practice.

This research project has important implications for nursing education and clinical practice. It has provided insights into the nursing research situation in Spain, knowledge needed with the present process of the European Convergence and the growing concern about the development of nursing research and evidence-based practice in the Spanish context.

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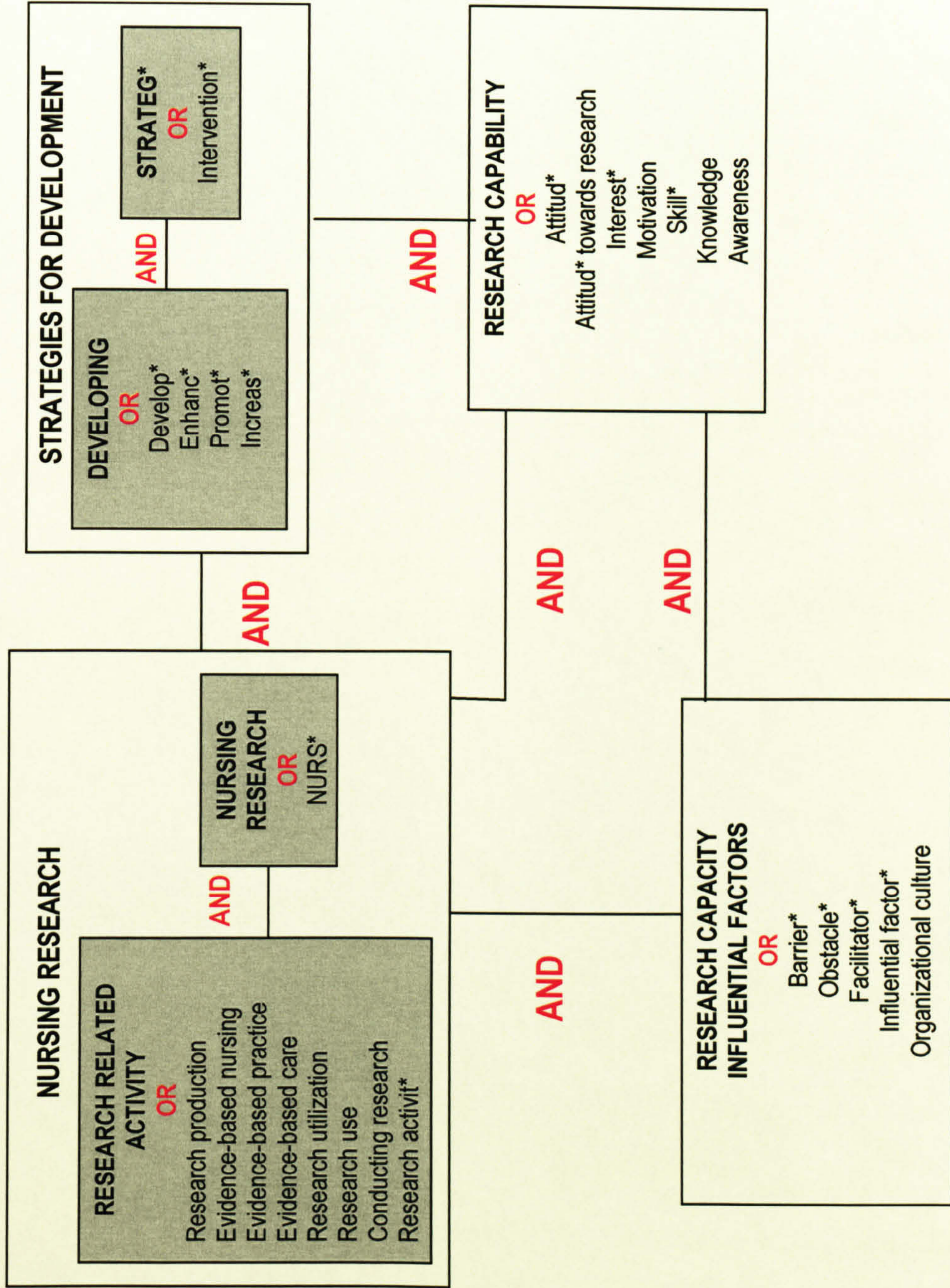
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Appendices

Appendix 1 Search strategy: Key terms, synonyms and combinations



Appendix 2 Search history



Friday, December 12, 2008 8:28:10 AM

#	Consulta	Limitadores y ampliadores	Último acceso realizado a través de	Resultados
S29	S28 and S21	Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	2
S28	S27 and S26	Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	238
S27	S25 and S24 and S23	Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	696
S26	strategy or strategies or intervention	Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	104569
S25	increasing or increase or promote	Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	89722
S24	develop or enhance or raise	Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	43355
S23	developing or enhancing or raising	Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	34929
S22	S20 and S18	Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	53
S21	S20 and S8	Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	1021
S20	S19 and S13	Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	1021
S19	nursing research	Limitadores - Año de publicación desde: 2006- 2008; Fecha en que se publicó desde: 200601- 200812 Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	1021
S18	S17 or S16	Limitadores - Año de publicación desde: 2006- 2008; Fecha en que se publicó desde: 200601- 200812 Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	6522

#	Consulta	Limitadores y ampliadores	Último acceso realizado a través de	Resultados
S17	facilitators or obstacle or obstacles	Limitadores - Año de publicación desde: 2006- 2008; Fecha en que se publicó desde: 200601- 200812 Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	1274
S16	influential factors or barrier or barriers	Limitadores - Año de publicación desde: 2006- 2008; Fecha en que se publicó desde: 200601- 200812 Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	5609
S15	influential factors or barrier or barriers	Limitadores - Año de publicación desde: 2006- 2008; Fecha en que se publicó desde: 200601- 200812 Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	5609
S14	S13 and S12	Limitadores - Año de publicación desde: 2006- 2008; Fecha en que se publicó desde: 200601- 200812 Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	1412
S13	nurse or nurses or nursing	Limitadores - Año de publicación desde: 2006- 2008; Fecha en que se publicó desde: 200601- 200812 Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	82583
S12	S11 or S10 or S9	Limitadores - Año de publicación desde: 2006- 2008; Fecha en que se publicó desde: 200601- 200812 Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	8813
S11	interest or motivation	Limitadores - Año de publicación desde: 2006- 2008; Fecha en que se publicó desde: 200601- 200812 Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	8644
S10	research knowledge or research skills or research awareness	Limitadores - Año de publicación desde: 2006- 2008; Fecha en que se publicó desde: 200601- 200812 Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	109
S9	research capability or research capacity or 'attitudes towards research'	Limitadores - Año de publicación desde: 2006- 2008; Fecha en que se publicó desde: 200601- 200812 Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	88

#	Consulta	Limitadores y ampliadores	Último acceso realizado a través de	Resultados
S8	S7 or S6 or S5 or S4 or S3 or S2 or S1	Limitadores - Año de publicación desde: 2006- 2008; Fecha en que se publicó desde: 200601- 200812 Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	2813
S7	research use or research utilization	Limitadores - Año de publicación desde: 2006- 2008; Fecha en que se publicó desde: 200601- 200812 Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	212
S6	evidence based practice or evidence based care or evidence based nursing	Limitadores - Año de publicación desde: 2006- 2008; Fecha en que se publicó desde: 200601- 200812 Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	1475
S5	evidence-based practice or evidence-based care or evidence-based nursing	Limitadores - Año de publicación desde: 2006- 2008; Fecha en que se publicó desde: 200601- 200812 Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	1475
S4	research related activities or research production or conducting research	Limitadores - Año de publicación desde: 2006- 2008; Fecha en que se publicó desde: 200601- 200812 Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	126
S3	research-related activity or research related activity or research- related activities	Limitadores - Año de publicación desde: 2006- 2008; Fecha en que se publicó desde: 200601- 200812 Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	10
S2	nursing research or research activity or research activities	Limitadores - Año de publicación desde: 2006- 2008; Fecha en que se publicó desde: 200601- 200812 Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	1151
S1	nursing research and research activity and research activities	Limitadores - Año de publicación desde: 2006- 2008; Fecha en que se publicó desde: 200601- 200812 Modos de búsqueda - Booleano/Frase	Interfaz - EBSCOhost Pantalla de búsqueda - Búsqueda avanzada Base de datos - CINAHL	0

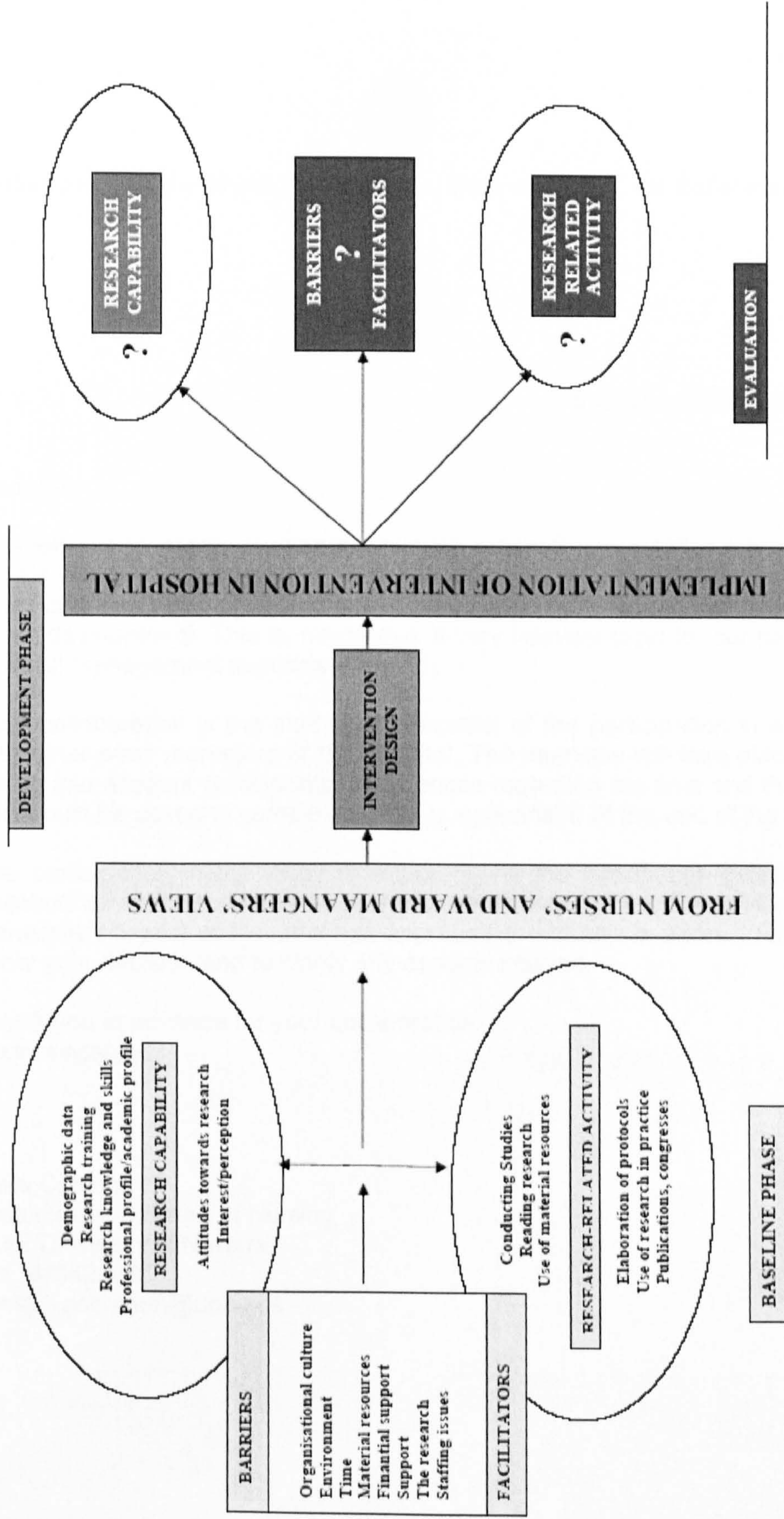
Appendix 3 Studies using the Barriers scale

Authors Year Country	Title	Methods	Sample	Results
Carroll et al (1997) USA	Barriers and facilitators to the utilization of nursing research	Survey	1100 nurses Response rate: 30%	<p>The top 5 barriers:</p> <ol style="list-style-type: none"> 1-The nurse is unaware of research 2-Insufficient time to implement new ideas 3-Research reports are not available 4-Lack of authority to change practice 5-Lack of time to read research <p>The top 5 facilitators:</p> <ol style="list-style-type: none"> 1-Increasing the time available 2-More clinically focused relevant research 3-Improving accessibility of research 4-Enhancing support-encouragement 5-Support network mechanisms
Dunn et al (1998) UK	Using research for practice: a UK experience of the Barriers Scale	Survey	3 groups of 316 nurses: 1-palliative care nurses 2-elderly care nurses 3-nurses undertaken a critical appraisal skills course	<p>Top 5 barriers</p> <ol style="list-style-type: none"> 1-Insufficient time 2-Statistical analysis not understandable 3-Physicians will not co-operate with 4-Nurses do not feel capable 5-Relevant literature not compiled in one place
Kajermo et al (1998) Sweden	Barriers to and facilitators of research utilization, as perceived by a group of registered nurses in Sweden	Survey	A randomly selected sample of 366 nurses. Response rate: 70%	<p>Top 5 barriers:</p> <ol style="list-style-type: none"> 1-Research not available 2-Facilities are inadequate for implementation 3-Nurse isolated from research knowledgeable colleagues 4-Nurses does not have time to read research 5-No time to implement new ideas <p>Facilitators:</p> <ul style="list-style-type: none"> -To improve knowledge and communication

Continued

Authors Year Country	Title	Methods	Sample	Results
Kajermo et al (2000) Sweden	Perceptions of research utilization: comparisons between health care professionals, nursing students and a reference group of nurse clinicians	Survey	5 groups: 1-Nursing teachers N=45 2-Nursing students N=205 3-Nursing administrators N=41. 4-190 Physicians randomly selected from two hospitals 5-237 Register nurses from two hospitals	Main barriers: Related to the organization and communication issues Facilitator: Research education
Oranta et al (2002) Finland	Barriers to and facilitators of research utilization among Finnish Registered Nurses	Survey	Convenience sample of 316 nurses working in two hospitals. Response rate: 80%	Top 5 barriers: 1-Not enough time to implement new ideas 2-Difficulty to understand statistics 3-Practical implication of research results no clear 4-The research is unclear and difficult to read 5-Physicians will not co-operate with implementation Facilitators: -The research deals with real, concrete nursing situations -Positive attitudes -Skills required acquired in nursing education -Support from managers
Retsas and Nolan (1999) Australia	Barriers to nurses' use of research: Australian hospital study	Survey	A convenience sample of 149 nurses of a hospital N=600. Response rate: 25%	Top 5 barriers: 1-Insufficient time to implement new ideas 2-Not enough time to read research 3-The nurse is unaware of the research 4-Statistics are difficult to understand 5-Facilities/resources are inadequate

Appendix 4 Conceptual map of the research study



Appendix 5 Letter for ward managers



Universidad de Navarra Escuela Universitaria de Enfermería

Pamplona, 25th April 2005

Dear Ms:

This letter is to inform you about a nursing research project that is being carried out in the University hospital of Navarra and to ask you for your collaboration. The aim of the study is to explore the nursing research culture in the hospital and the influential factors for its development. This is, nowadays, a very relevant topic for our profession and the hospital management supports this study.

Your collaboration in the study would consist of the participation in a group interview with other ward managers of the hospital. The interview will take place in the hospital taking into account participants' preferences regarding the time and the date. Besides, you would be asked to complete a brief questionnaire at the end of the interview.

The participation in the study is voluntary. All the information gathered through the questionnaires and interviews will be confidential. The Ethics Committee of the University hospital of Navarra has approved the study. In short, I will contact you to know your decision and to clarify any aspects needed.

Thank you in advance for your collaboration.
Yours sincerely,

Silvia Corchón
Lecturer of the School of Nursing
EUE. University of Navarra.
Tel. 948425645
E-mail: scorchon@unav.es

Appendix 6 Letter for clinical nurses



Universidad de Navarra Escuela Universitaria de Enfermería

Pamplona, 22nd September 2005

Dear colleague:

This letter is to inform you about a nursing research project that is being carried out in the University hospital of Navarra and to ask you for your collaboration. The aim of the study is to explore the nursing research culture in the hospital and the influential factors for its development. This is, nowadays, a very relevant topic for our profession and the hospital management supports this study.

Your collaboration in the study would consist of completing a questionnaire. To do so, you could attend to the room 'quirófano' during the following dates and times:

<i>T 29 September</i>		<i>F 30 Sept</i>	<i>M 3 October</i>		<i>T 4 Oct</i>	<i>T 6 Oct</i>	<i>F 7 Oct</i>
8-14:30h	16h-21h	10-21h	9:30-16	17-21	8-14:30h	8-21h	10-21h
Room	Room	Room	Room	Room	Room	Room	Room
Quirófano	Quirófano	Quirófano	Quirófano	Quirófano	Quirófano	Quirófano	Quirófano

The ward manager of your unit has been informed about the study and would facilitate your participation.

This study would not be possible without your collaboration and this is why we ask you to share your opinions with us. All the information gathered will be confidential. The Ethics Committee of the University hospital of Navarra has approved the study.

Do not hesitate to contact me if you need any further information.
Thank you in advance for your collaboration.

Yours sincerely,

Silvia Corchón
Lecturer of the School of Nursing
EUE University of Navarra
Tel. 948425645
E-mail: scorchon@unav.es

Appendix 7 The Nursing Research Questionnaire (NRQ)

CODE:

QUESTIONNAIRE

“The Nursing research activity in the University Hospital of Navarra”

This study aims at knowing the nursing research activity at CUN. With this in mind, the following questionnaire has been developed to get some information regarding nursing research capacity, research activity and the existing barriers to or facilitators of its development.

Instructions:

- **Please, read carefully the questionnaire.**
- **The questionnaire mainly contains fixed questions and a few open-ended questions.**
- **Please, try to answer to all the relevant questions.**
- **Please, note that all the information you give will be confidential. The code is simply to keep a register number during the data collection process. Nobody, but the researcher, will have the possibility to identify the number with the person.**
- **Once you have filled in the questionnaire, please introduce it in the provided envelop.**
- **If you have any comments, please do not hesitate to contact the person that appears at the end of the questionnaire.**

Thank you for your help!



NURSING RESEARCH CAPABILITY

GENERAL ACADEMIC AND PROFESSIONAL PROFILE:

1- Could you indicate the year in which you got your nursing degree?.....

2- For how many years have you worked as a staff nurse?.....

3- In which speciality area/s? (tick as many as apply)

- Cardiology
- Intensive care
- Surgical area
- Traumatology and orthopaedic surgery
- Paediatric nursing
- Medical nursing
- Psychiatric nursing
- Surgical theatre
- Midwifery
- Others (specify).....

4- For how long have you worked at CUN?

5- Where are you currently working? (Please, specify the ward)

6- Please, specify your employment situation (Make a cross in the one that applies)

	Full-time	Part-time	Other (specify)
Indefinite	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Temporary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7- Have you done (or are you currently doing) any nursing specialisation course?

- Yes (*go to the next question*)
- No (*go directly to question 10*)

8- Please, mark the specialisation course/s that you have done (or are doing):

- Cardiology
- Intensive care
- Surgical area
- Traumatology and orthopaedic surgery
- Paediatric nursing
- Medical nursing
- Psiquiatric nursing
- Surgical theatre
- Others (specify).....

9- When have you done the specialisation course/s?

10- Have you done any other postgraduate course/s?

- Yes (specify).....
 No

11- Please, specify your mastery in languages? (circle the one/s that applies if: none: any knowledge at all; low: you have some knowledge but many difficulties with the language; medium: enough to read academic/research papers; high: you can fluently read and speak)

	NONE	LOW	MEDIUM	HIGH
a. English	1	2	3	4
b. French	1	2	3	4
c. Other (specify).....	1	2	3	4

RESEARCH KNOWLEDGE:

12- Have you received any specific training in nursing research (apart from that during the nursing studies and specialisation course)?

- Yes (specify).....
 No

13- Please, indicate your level of knowledge in the following areas?

(Please, circle the pertinent option in each of the areas if they mean:

none: no knowledge at all; low: you have received preparation but you consider that your knowledge is not enough; medium: you have knowledge/experience but you may need some help/supervision to do it properly; high: knowledge/experience enough to manage your-self with the activity)

	NONE	LOW	MEDIUM	HIGH
a. Searching in databases	1	2	3	4
b. Reading research articles	1	2	3	4
c. Critically appraise research	1	2	3	4
d. Designing a research study	1	2	3	4
e. Analysis of quantitative data	1	2	3	4
f. Analysis of qualitative data	1	2	3	4
g. Writing up reports	1	2	3	4
h. Informatics	1	2	3	4
i. Others (specify).....	1	2	3	4

14- In general, you consider that your knowledge about nursing research is:

- None
- Low
- Medium
- High

15- Would you like further training in research?

- Yes (specify).....
- No

16- Would you like to participate in research studies?

- Yes
- No

17- ATTITUDES TOWARDS RESEARCH Please, circle the appropriate option in each of the following items (SA: strongly agree; A: agree; U: Undecided; D: disagree; SD: strongly disagree)

	SA	A	U	D	SD
1. I find that most reports of research in nursing are too complex to understand	1	2	3	4	5
2. Most nurses are competent to undertake research	1	2	3	4	5
3. Most nurses are aware of relevant research findings	1	2	3	4	5
4. I feel that my managers encourage me to develop an interest in research	1	2	3	4	5
5. I feel that nursing research complicates the daily nursing work	1	2	3	4	5
6. I value when some of my peers do research work in nursing	1	2	3	4	5
7. We do not need any researchers in nursing to develop the care	1	2	3	4	5
8. Nurses are too busy delivering care to spend time reading research	1	2	3	4	5
9. I would be involved in research activities if the time was provided for me	1	2	3	4	5
10. Nurses are not in need of knowledge based on research as much as doctors	1	2	3	4	5
11. Research is a specialist activity that is relevant to only a few nurses working in the clinical areas	1	2	3	4	5
12. Research is only relevant to nurse education, not to nurse practice	1	2	3	4	5
13. Most clinical nurses are not interested in implementing research findings	1	2	3	4	5
14. Nursing should become a research based profession	1	2	3	4	5
15. Research findings have little impact on nursing practice	1	2	3	4	5
16. An essential role of the nurse is to carry out research	1	2	3	4	5
17. Most nurses don't have any motivation to carry out research	1	2	3	4	5
18. I think that nursing research is important	1	2	3	4	5
19. I think that nursing research is interesting	1	2	3	4	5

18- Is there anything else you would like to add about your opinions on nursing research?

.....
.....
.....

RESEARCH RELATED ACTIVITY

19- Have you ever been involved in any research study?

- Yes (in how many?.....) *(Go to the next questions)*
- No *(go directly to question 24)*

20- Which kind of research have you carried out? (please, tick as many as apply)

- Nursing research
- Medical research
- Multidisciplinary research
- Others (specify.....)
- I don't know

21- Which aspects of the research have you been involved with? (tick as many as apply)

- Direction of the project
- Definition of the area/topic of research
- Review of the literature
- Study design
- Data collection
- Data analysis
- Writing up the report
- Other (specify).....

22- Which kind of study/ies have you carried out? (tick as many as apply)

- Experimental
- Descriptive
- Qualitative
- Other (specify).....
- I don't know

23- In general, how would you describe your experience in nursing research?

- Very good
- Good
- Undecided
- Bad
- Very bad

Why?

.....
.....

24- How often do you:	Never	Once/ twice a year	Every 2-3 months	Once a month	Twice/ month	Once a week	> than once a week
a) use databases?	1	2	3	4	5	6	7
b) use library resources?	1	2	3	4	5	6	7
c) read research articles/ professional journals?	1	2	3	4	5	6	7

25- Which journal/s do you usually read, if any?

.....

26- Are you subscribed to any nursing professional journals?

- Yes (which one/s?).....
- No

Why?.....
.....

27- How often do you:	Never	Seldom	Sometimes	Frequently	All the time
a) use research results for making decisions in your clinical practice?	1	2	3	4	5
b) use research results to elaborate clinical guidelines?	1	2	3	4	5

28- How often do you attend nursing conferences/congresses?

- Never
- Seldom
- Once every 2-3 years
- Once every year
- > Than once a year

Why?.....
.....

29- Have you ever participated with any communication in a congress? (although you did not present it)

- Yes (how many?).....
- No

30- Have you ever participated in a congress/symposium with a poster?

- Yes (how many?).....
- No

31- Have you ever published a paper?

- Yes (how many?).....(*go to the next questions*)
- No (*go directly to question 33*)

32- Which kind of publication was your paper? (tick as many as apply)

- Research article
- Practice protocol
- Clinical case
- Literature review
- Opinion article/commentaries
- Book chapter
- Others (specify).....

33- Please, indicate if you can think of any other research-related activity you have done, or usually do, and that has not been covered with the above questions?

.....
.....

34- Could you indicate a research priority area in your field?

.....

INFLUENTIAL FACTORS: BARRIERS AND FACILITATORS

This section asks you about aspects that you consider to have an impact on your research activities. Please, write 3 facilitators & 3 barriers that YOU HAVE to develop your research activity. Put them in order of importance, being the most important in number 1.

35- Issues about conducting research studies in your site, please indicate them in order of importance:

<u>FACILITATORS YOU HAVE</u>	<u>BARRIERS YOU HAVE</u>
1-	1-
2-	2-
3-	3-

36- Thinking on reading research, please indicate in order of importance:

<u>FACILITATORS YOU HAVE</u>	<u>BARRIERS YOU HAVE</u>
1-	1-
2-	2-
3-	3-

37- What would you change to develop nursing research in your site?

.....

DEMOGRAPHIC DATA

38- Please, indicate your age:.....years

39- Marital status: Single Married Other (specify.....)

40- Do you have children?: Yes No

41. Other family commitments (in charge of an elderly person): Yes No

42- Is there anything else you would like to comment? (use the back page if needed)

.....

If you have any questions or further comments, please do no hesitate to contact me at:
scorchon@unav.es
Silvia Corchón
948425645

Appendix 8 Pilot study: feed-back sheet and comments

CÓDIGO:

Questionnaire: NRQ

The objective of this pilot study is to assess the questionnaire you have completed. Please, write any comments you have that could help to improve the tool. Thank you for your help!

Opinions about the tool:

1. (PA1)- I needed 45 min. to complete it, some aspects are not easy to answer.
2. (PA2)- It is clear and not long to fill in.
3. (PA3)- Dense.
4. (PA4)- Very interesting topic about what nurses think and need about research. It is a mistake to refer to nurses only as female.
5. (PM1)- It is clear and easy to answer. With the open-ended questions (about barriers and facilitators) if you are not familiar with the topic, you do not know what to answer.
16. (PM12)- A bit too long.
19. (PM15)- In general, it is easy to answer. Interesting topic. It generates controversy and discussion.
20. (PAN1)- Very interesting but the last part is not easy to answer (barriers and facilitators).

Aspects that could be improved:

1. (PA1)- It would be better to have all closed questions.
2. (PA2)- In the likert scale the colours, although it is clearer with them, they can also indicate less or more important answers. I would leave it with the same intensity. In the demographics you only include children as family issues, but I will also introduce other (maybe you could be in charge of other familiars)
3. (PA3)- To define in advance the meaning of some questions such as facilitators, barriers.
4. (PA5)- It is a very complete questionnaire. However, it is long and this may lead nurses to feel tired and loss interest. Time to complete: 40 min
5. (PM1)- In the attitudes scale the item number 5 is not clear, you can understand: it is complicated to do research and work (because of workload) or that when other nurses do research complicates others' work.
8. (PM4)- The questionnaire is very good and it is helpful to realise that we do not have a research culture among nurses and that the organization does not support it at all.
16. (PM12)- In the last part I would put closed questions because it is the end of the questionnaire and it might be too long.
19. (PM15)- I will try to change questions from 34-38 to make them easier to answer.

Other comments:

Thank you very much for your help!

Appendix 9 Focus groups questions

This questioning route has been developed from the literature review and from the conceptual map of this study. I have specially looked at the very few qualitative studies found, and used some of their questions as a template (Adamsen et al 2003; Davies et al 2002; Ax and Kincade 2001; Le May et al 1998). In this Appendix, some explanation or reflexions about the issue being asked are included after each question.

NURSING RESEARCH: MANAGERS' UNDERSTANDING, PERCEPTIONS AND ATTITUDES

1- Could you please tell me what do you understand by the term 'nursing research'?

I do not need a proper definition but I think that it would be interesting to know how they understand the concept. So, I could ask them about examples. Previous research has noted much confusion regarding what exactly nursing research is.

2- What do you consider that nursing research does or may do (for our profession)? Why? Could you tell me whether you consider that nursing research makes any specific contribution to nurses' daily work? Examples?

I think that I should know their attitudes towards it and whether they are interested in nursing research. Whatever their answer is, I think that it is important to know whether they think that research has something to do with nursing practice. Here, I can help them to recall whether any research activities undertaken in their wards have made any specific contribution in the way they work. If not, why?

3- In general, could you describe your feelings and reactions to the ideas of research?

I think that this is an important question. It has been taken from Ax and Kincade's study. However, I also think that it is delicate and that they could feel intimidated to answer in public. So, maybe I can know it from their answers and reactions to the other questions.

4- What do you think about nurses' interest in research? Do you think that your staff nurses are interested in nursing research? Why?

To know whether they consider that nurses are motivated to do research. This could be also interesting because it would be asked to nurses as well in the survey, and it would help us to know whether the ward managers have a realistic perception of nurses' attitudes towards it.

5- Regarding clinical nurses' role or functions, how do you see the research activity? Do you think that it is an important part of their role?

To know whether they consider that clinical nurses should be research active (by this, we mean not only to conduct research studies, but to read research, to attend to congresses...) or whether they think that part of their role is to do research. To understand the value they give to the fact that nurses do research.

WARD MANAGERS' ROLE AND PERSONAL INVOLVEMENT

6- Is there any nursing research activity that you can remember to be recently or currently undertaken in your ward?

I think that it could be interesting to make them recall about it. If they do so, they could become more aware of the situation they have regarding nursing research in their site. Probably, most of them would talk about the work that nurses doing the specialisation course have to do to get the grade. Some of them also have the experience of a project being undertaken in their wards by a PhD student of the Nursing School.

7- During the time the research was being undertaken, did it have any impact on the ward? (*Was the normal rhythm of the ward changed?*) How? Why? Is there anything you did or you had to do during that time that differs from your usual activities?

It could be also interesting to ask them about the feelings of the other nurses working in the ward during the time of the study. Did they support it? Was it seemed as a waste of time?

8- Regarding the study, what was your role? How did you feel about it?

To know whether they were directly involved in the study (in the design, literature review) or just supporting it.

9- Overall, what do you think about the experience? (*How do you consider that it is (or it has been) for the ward?*) Why?

To know their feelings, nurses' feelings and whether it has helped to the daily practice.

10- Would you like or do you wish to see more research activity in your ward? Why?

11- In general, is there anything that you consider you can do to foster nursing research activity in your ward? Are you currently doing something about it? It is a priority in your agenda?

To see whether they are involved in trying to develop nursing research in their wards. To know if they consider that they have any specific role/responsibility regarding nursing research in their wards. I think that I should know if they feel responsible for this or not. (I will also ask nurses about managers' support and I think that it is interesting to know managers' opinion about this issue).

BARRIERS AND FACILITATORS

12- How confident do you feel regarding nursing research and your role about it? Why?

Here, I will try to know the personal factors/characteristics/research capability that could be important to consider.

13- Have you noticed any change in your ward regarding nursing research during the last few years? How has it been? Why do you think that this has happened?

To know whether managers could explain the tendency of nursing research in their wards during the last few years and the reasons they think may explain it.

14- What are the factors that you consider to be helpful/necessary to develop nursing research?

Facilitators. To date, most of the studies have looked exclusively at the barriers.

15- Do you feel that you have the mentioned aspects (facilitators) in your wards? Why? What do you miss?

16- Is there any aspect that you consider to be an obstacle/challenge to the development of nursing research in your ward? Are there any particular issues you think need to be changed?

Barriers to nursing research. After they say the barriers.

17- Imagine the 'perfect' situation for the development of nursing research in your ward. Could you describe it?

To check for any other barrier and facilitator that they could have forgotten. This could be also very helpful for the strategy development.

18- What would you do to change the existing situation, if necessary? Is there anything you could do? Is there any particular issue that you need have to be changed but you have not the authority to do so? Which person's responsibility is it?

The literature suggests that ward managers are very much concerned with organisational issues and barriers. Some of them are out of their possibilities.

19- Is there anything else you would like to say?

Appendix 10 Focus groups objectives

GENERAL OBJECTIVE To explore, through group interaction, ward managers' perceptions about nursing research in their wards and the barriers to and facilitators for its development.		
SPECIFIC OBJECTIVES To explore their understanding, perceptions and attitudes towards nursing research and their involvement in research activities. To see the existing barriers and facilitator from their point of view. The items that appear in Bold are considered the KEY QUESTIONS.		
THEMES	ISSUES ADRESSED	QUESTION NUMBERS
NURSING RESEARCH: Understanding, perceptions and attitudes	The concept The contribution for the profession Feelings and reactions Nurses' interest Is it part of nursing role?	1-5
WARD MANAGERS' ROLE AND PERSONAL INVOLVEMENT	Research activity in their wards and experience with it Role played Willingness for more research activity in the ward Importance	6-11
BARRIERS AND FACILITATORS	Confidence The tendency of research activity Facilitators Barriers Changes needed Authority to change	12-18
ADDITIONAL INFORMATION	Is there anything else you would like to say?	19

Appendix 11 The Ward Managers' Questionnaire (WMQ)

CODE

The following questionnaire tries to obtain information regarding your academic and professional profiles, your research experience and other demographic data. It will take you a few minutes to complete. All the information will be confidential. Thank you for your collaboration.

ACADEMIC AND PROFESSIONAL PROFILE

- 1- Could you indicate the year in which you qualified as a nurse?.....
- 2- For how many years have you worked as a staff nurse?
- 3- In which speciality area/s?.....
- 4- Could you indicate since when are you working as a ward manager?.....
- 5- In which area/s?.....
- 6- Have you done any nursing specialisation course?
 - Yes Which one/s?.....
When?.....
 - No
- 7- Have you done any other postgraduate course/s?
 - Yes Which one/s?.....
When?.....
 - No
- 8- Please, indicate your highest educational degree?
 - Diploma
 - Bachelor
 - Master
 - PhD

NURSING RESEARCH KNOWLEDGE AND EXPERIENCE

- 9- Have you received any specific training in nursing research? (apart from the specialisation course)
 - Yes (specify).....
 - No

10- Could you indicate your level of knowledge/skill in the following areas?

(Please, circle the pertinent option in each of the areas if they mean:

none: no knowledge at all; low: you have received preparation but you consider that your knowledge is not enough; medium: you have knowledge/experience but you may need some help/supervision to do it properly; high: knowledge/experience enough to manage your-self with the activity)

	NONE	LOW	MEDIUM	HIGH
a. Searching in databases	1	2	3	4
b. Reading research articles	1	2	3	4
c. Critically appraise research	1	2	3	4
d. Designing a research study	1	2	3	4
e. Analysis of quantitative data	1	2	3	4
f. Analysis of qualitative data	1	2	3	4
g. Writing up reports	1	2	3	4
h. Informatics	1	2	3	4
i. Others.....	1	2	3	4

11- In general, you consider that your knowledge regarding nursing research is:

- None
- Low
- Medium
- High
- Don't know

12- Would you like further training in research?

- Yes (specify).....
- No

13- Have you been involved in any nursing research study during the last 2 years?

- Yes (in how many?.....)
- No (go to question 15)

14- If so, which roles have you taken? (tick as many as applicable)

- Literature review
- Defining the area of research
- Study design
- Data collection
- Analysis of data
- Writing up the report
- Other (specify).....

15- Have you published any article in the last 2 years?

- Yes (how many?.....(go to question 17)
- No (go directly to question 16)

16- Which kind of article/s have you published? (please, tick as many as apply)

- Research article
- Practice protocol
- Clinical case
- Literature review
- Opinion article/commentaries
- Others (specify).....

17- Have you attended any congresses/conference during the last 2 years?

- Yes (go to question 18)
- No (go directly to question 19, in the next section)

18- Please specify as accurately as you can:

How many congresses/conferences have you attended to in the last 2 years?.....

Where were they held?(city.....

Did you participate with: Conference? Yes (Number.....) No

Communication? Yes (Number.....) No

Poster? Yes (Number.....) No

Other?.....

DEMOGRAPHIC DATA

19- Please, state you age:.....years

20- Marital status: Single Married Other

21- Do you have children?: Yes No

22- Is there anything else you would like to comment? (use the back page if needed)

.....
.....

23- Would you like to be contacted for a personal interview?: Yes No

Thank you very much for your help!

CUESTIONARIO

“Investigación Enfermera en la Clínica Universitaria de Navarra”

Este estudio pretende conocer el estado de la investigación enfermera en la Clínica. Con este objetivo, se ha diseñado un cuestionario acerca de la actividad investigadora enfermera, y los factores que influyen en su desarrollo.

Tu participación consistiría en rellenar un cuestionario (tiempo estimado de 30 minutos). Para ello, podrás acudir en el momento que consideres más oportuno, dentro del horario establecido, a las siguientes aulas:

<i>Jueves 29 September</i>		<i>Viernes 30 Sept</i>	<i>Lunes 3 October</i>		<i>Martes 4 Oct</i>	<i>Jueves 6 Oct</i>	<i>Viernes 7 Oct</i>
8-14:30h Aula Quirófano	16-21h Aula Quirófano	10-21h Aula Quirófano	9:30-16h Aula Quirófano	17-21h Aula Quirófano	8-14:30h Aula Quirófano	8-21h Aula Quirófano	10-21h Aula Quirófano

La participación es totalmente voluntaria. Sin embargo, este estudio no sería posible sin tu colaboración. Todos los datos que facilites serán completamente confidenciales.

¡ Muchas gracias por tu ayuda!

Si tienes alguna pregunta o comentario, por favor, no dudes en ponerte en contacto conmigo:

Silvia Corchón

scorchon@unav.es

948425645

Appendix 13 Informed consent form



Universidad de Navarra Escuela Universitaria de Enfermería

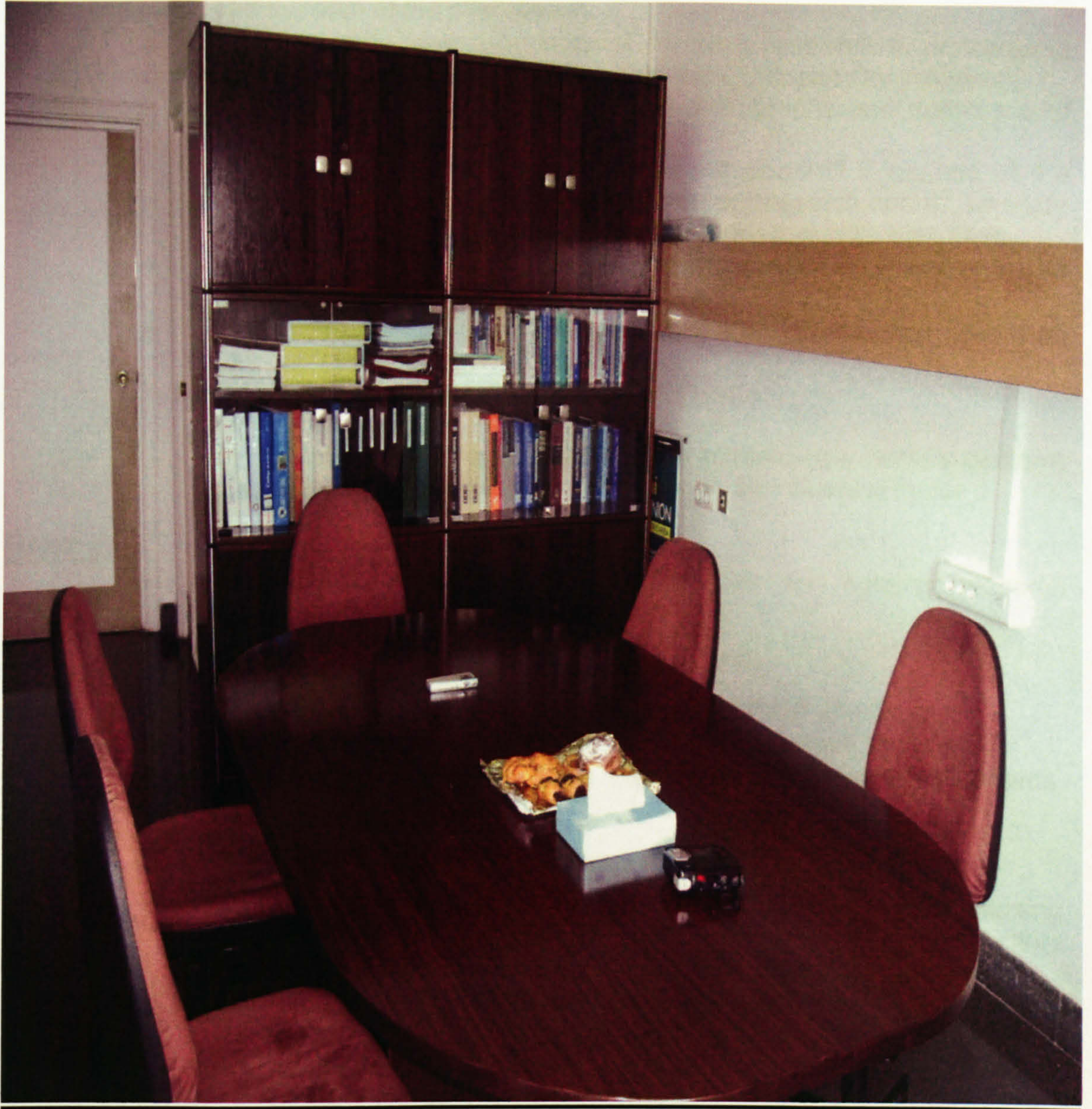
Informed consent form

I _____ have received from Ms _____ clear and comprehensive information about the Project 'The development, implementation and evaluation of a strategy designed to enhance nursing research in clinical nursing: a realistic evaluation study'. I voluntarily agree to participate and give my consent to tape record the content of the focus group.

Date

Signature

Appendix 14 Focus groups room



Appendix 15 Seminar with ward managers (WMS)

PART 1

- Brief presentation of the study, the hospital interest in developing nursing research and the plan of the intervention.
 - To discuss about **the relevance of nursing research** in professional development, especially nowadays with the European Convergence.
 - To illustrate its importance with bibliography and quotations of the focus groups
 - To work in small groups: Why is it important? If you had all the resources needed: what would you do research about? To study the existing reality, the context, the real resources they have...
 - To give a brief presentation of the **nursing research situation in the hospital** using the baseline results.
 - To discuss about **ward managers' role** in nursing research development using:
 - focus groups results
 - Bibliography
 - Results of the questionnaire with nurses: how nurses perceive the support received by managers as an influential factor

PART 2

- To identify the **facilitators and barriers** for nursing research development in this context, using:
 - Focus groups results
 - Questionnaire with nurses results
 - Bibliography (to contrast with other contexts' situation)
- To give them the opportunity to add any other important factor.
- To discuss in groups about the barriers and facilitators. Afterwards, there will be discussion.

PART 3

- To **think about strategies** that may contribute to develop nursing research activity in their wards (considering the influential factors presented before)
 - What kind of nursing research do we want?
 - Considering the existing situation: what can be done? Do not focus only on the barriers, try to see the potential facilitators and how to develop them.
 - To explain them the different interventions that could be used and discuss about them.
 - To identify high and low impact interventions, long term and short term...Realistic plans!

Appendix 16 Research methods course (RCO)

DAY 1

Morning

- Brief presentation of the study, the hospital interest in developing nursing research and the plan of the intervention.
- To discuss about **the relevance of nursing research** in professional development, especially nowadays with the European Convergence.
- To help them to think about interesting research areas for clinical practice.
- What it is a Journal club?

Afternoon

- Basic literature searching knowledge: key words, limits, how to find a paper, basic exercises.
- Practical session with databases.

DAY 2

- Quantitative research methods. To give them the knowledge needed to be able to understand and critically appraise a quantitative article.
- Qualitative research methods. To give them the knowledge needed to be able to understand and critically appraise a qualitative article.
- Practical exercises with quantitative and qualitative research articles:
 - How to read a paper?
 - How to critically appraise a paper?

Appendix 17 Research knowledge objective test

CODE:

- 1- Tick the wrong answer regarding nursing research:
 - a. Its main objective is the development of nursing body of knowledge
 - b. It has to be conducted always under the supervision of a doctor in medicine**
 - c. The evidence obtained should be applied in nursing practice
 - d. It is an activity that nurses can conduct

- 2- When doing a critical analysis (appraisal) of a research paper:
 - a. It is important to take into account whether it is a qualitative or a quantitative piece of research**
 - b. The rigour criteria are the same regardless the kind of study conducted
 - c. A published paper does not need to be critically appraised because the journal editors have already done it
 - d. The answers a and c

- 3- In general, a research article is structured as follows (has the following parts):
 - a. Introduction, material and methods, results
 - b. Introduction, results and conclusions
 - c. Introduction, material and methods, results, discussion and conclusions**
 - d. Each article is very different

- 4- In the results, a research article should include the following:
 - a. An explanation of the data collection methods
 - b. A description of the principal results of the study**
 - c. An interpretation of the results looking at the same time at the literature
 - d. Recommendations for future research studies

- 5- Regarding the limitations of a study:
 - a. They should never be recognised by the author
 - b. Whether they are identified depend on the knowledge of the reader
 - c. The author should recognise the principal limitations of the study and give recommendations to overcome them in future studies**
 - d. If a research study has limitations, its results should not be taken into account

- 6- Indicate the right answers regarding the ethics aspects of a research study:
 - a. It is not necessary to think about ethical issues because many problems could arise if you do so
 - b. Data can be shown to any person even though are not part of the research team
 - c. The participation in a research study should be always volunteer**
 - d. Any of the answers is correct

- 7- In a research article the ethical aspects:
 - a. Should appear explicitly**
 - b. Are not necessary because it is taken by grant that they have taken those into account
 - c. It depends on the authors' preferences
 - d. The informed consent should always appear as an appendix

- 8- Tick the wrong answer regarding qualitative and quantitative studies:
 - a. They give answers to different kind of questions
 - b. They have different paradigms
 - c. In nursing research both can be used
 - d. Only qualitative studies are useful for nursing research**

- 9- What does it mean that data saturation has been achieved?
- That there is too much information and the informatics systems can not deal with it, therefore you have to do manual analysis
 - That new participants don't add any new information and therefore data collection can stop**
 - That the research is saturated (burned) and it is not good to continue
 - All are right answers
- 10- What do the different designs of qualitative research have in common?
- They are interested in phenomena related to health, illness and health care
 - They are focused on the experiences lived by people
 - Their flexibility
 - All are right answers**
- 11- The sampling strategy in qualitative research:
- Searches for the generalization of the results
 - It allows the researcher to do analytic and logic generalization**
 - It is necessary to calculate in advance the sample size needed
 - All are right answers
- 12- The content analysis consists on:
- A codification process to organise data in common categories
 - Identifying the categories and emergent themes from the data
 - a and b are right**
 - All are wrong
- 13- To appraise a qualitative study it is important to look at (tick the right answer):
- The sample size
 - The reliability coefficients of the instruments
 - The author should provide in depth and detailed description of the whole data collection and analysis process**
 - All are right answers
- 14- Which of the following research design could make cause-effect inferences?
- Correlational
 - Experimental**
 - Retrospective
 - Descriptive
- 15- Which one of the following reasons could lead authors to choose a descriptive design?
- When the manipulation is easy and possible
 - When we do not want to know how phenomena happen but to control the variables
 - When manipulation is not ethical**
 - Because the researchers' preferences
- 16- Which one of the following is not a data collection method?
- Semi- structured interview
 - Telephone survey
 - Observations
 - Random sampling**
- 17- If we want to follow a sample along a period of time, which research design would we use?
- Longitudinal**
 - Descriptive
 - Retrospective
 - Transversal

- 18- The principal objective of descriptive studies is:
- To compare results in two groups that follow the same treatment
 - To improve clinical practice through the implementation of a new protocol
 - To describe the characteristics of some variables in the population**
 - To summarise the evidence about a concrete theme
- 19- Quantitative studies (tick the wrong answer):
- Use measure instruments to collect data (scales, questionnaires...)
 - Are based on qualitative data
 - To obtain data they use in depth interviews**
 - Results are statistically analysed
- 20- The difference between an experimental and quasi experimental study is:
- The participants number: the quasi experimental does not need as many as the experimental
 - The assignation of participants into the two groups: the experimental is random and in the quasi-experimental no**
 - The quasi experimental is a pilot study to do later an experiment
 - All are wrong

Appendix 18 Facilitators and barriers scale

CODE:

Please, circle the appropriate option in each of the following items. To what extent it is at the moment a facilitator for nursing research in your ward (1: to no extent; 2: to a little extent; 3: to a moderate extent; 4: to a great extent; 5: no opinion)

	To no extent	To a little extent	To a moderate extent	To a great extent	No opinion
1. My ward manager is the 'motor'/motivates to nursing research development	1	2	3	4	5
2. My ward manager encourages me to develop an interest in research	1	2	3	4	5
3. My ward manager facilitates me to leave the shift to do research	1	2	3	4	5
4. Nurses have time to read research	1	2	3	4	5
5. The few 'free time' that we have during the shift is used to read research	1	2	3	4	5
6. I would be involved in research activities if the time was provided for me	1	2	3	4	5
7. To have time is the most important factor to do research	1	2	3	4	5
8. I have 'research experts' help when I need it	1	2	3	4	5
9. The way in which the work is organised in the ward facilitates research	1	2	3	4	5
10. Most reports of research in nursing are too complex to understand	1	2	3	4	5
11. I have enough preparation/knowledge to read research studies	1	2	3	4	5
12. I have enough preparation/knowledge to conduct research studies	1	2	3	4	5
13. I read papers relevant to my speciality area	1	2	3	4	5
14. I think that reading nursing research papers is important for my practice	1	2	3	4	5
15. Nursing research results have little impact in nursing practice	1	2	3	4	5
16. I value when some of my peers do research work in nursing	1	2	3	4	5
17. I have enough English level to understand a research paper	1	2	3	4	5
18. It is possible to read about research during the shift	1	2	3	4	5
19. In the ward we have enough material to read: journals, books...	1	2	3	4	5
20. The access to the library is easy	1	2	3	4	5
21. It is easy to access to research papers	1	2	3	4	5
22. Databases are helpful to access to the information	1	2	3	4	5
23. I am motivated to carry out research	1	2	3	4	5
24. I can identify gaps in my practice that would need research knowledge	1	2	3	4	5
25. I think that nursing research is important	1	2	3	4	5
26. I think that nursing research is interesting	1	2	3	4	5
27. I think that nursing research is necessary	1	2	3	4	5

Are there other things that you think are facilitating nursing research in your ward?

Are there other things you think are barriers to nursing research in your ward?

Appendix 19 General views about journal clubs

CODE:

UNIT:

1- How many journal clubs have you attended?

Why?

2- Would you have liked to attend more?

Yes

No

3- How effective have the journal clubs been for: (rank from 1-5, 1 for the most and 5 for the less effective)

- Learning and understanding how to critique research studies
- Teaching the research process
- Regarding the acquisition of research skills
- Regarding your research awareness
- Using research findings in practice
- Using more material resources
- Regarding your willingness to read
- Regarding your interest in research

4- What do you think that has been the main contribution of journal clubs?

5- Is there anything else you would like to add?

Appendix 20 Ward managers' perceptions about barriers to and facilitators for nursing research

1- Please, indicate in order of importance (1 the most and 5 the less) the facilitators and barriers that you have at the moment to develop a nursing research culture in your ward

<u>FACILITATORS</u>	<u>BARRIERS</u>
1-	1-
2-	2-
3-	3-
4-	4-
5-	5-

2- Have your expectations regarding the development of a nursing research culture in your ward changed after the seminar?

- Yes
 No

If yes:

What have changed in your expectations?

Why?

If not:

Why?

Appendix 21 Questionnaire for ward managers

CODE:

WARD/UNIT:

1- Please indicate, in order of importance (1 the most and 5 the least), the facilitators and barriers that you have at the moment to developing a nursing research culture in your ward

<u>FACILITATORS</u>	<u>BARRIERS</u>
1-	1-
2-	2-
3-	3-
4-	4-
5-	5-

2- In the past year of implementing the research strategy in the hospital, to what extent do you perceive that the research culture of your ward has changed?

To no extent To a moderate extent To a great extent

In what sense?

Why?

3- In the past year of implementing the research strategy in the hospital, have your expectations regarding the research culture development been met?

To no extent To a moderate extent To a great extent

Why? (please give as much detail as possible)

4- What things would you have done differently?

Why?

5- General views about the different activities undertaken:

a- What do you consider the most effective activity of the intervention? (rate them from 1 to 4 in order of effectiveness, 1 the most and 4 the less)

- **Journal clubs**
- **Seminars**
- **Research course**
- **Mentorship**

Why?

b- What do you think has been the main contribution of:

- Journal clubs?

- Seminars?

- Research course?

- Mentorship?

6- What do you think should be the priorities for next year to develop a nursing research culture in the hospital?

7- Is there anything else you would like to add?

Appendix 22 Guide to collect information about journal clubs

Date:

Time:

Duration:

Article:

Title:

Reasons for its choice:

Participants:

Number:

Wards:

General aspects:

Participation

Discussion: focus i.e methodology, impact for practice...

Had participants read the article in advance?

Other relevant aspects

Appendix 23 Questionnaire for mentors

CODE:

1- In the past year of implementing the research strategy in the hospital, to what extent do you perceive that the research culture of your ward has changed?

To no extent To a moderate extent To a great extent

In what sense?

Why?

2- In the past year of implementing the research strategy in the hospital, have your expectations regarding the research culture development been met?

To no extent To a moderate extent To a great extent

Why? (please, give as much detail as possible)

3- What things would you have done differently?

Why?

4- General views about the different activities undertaken:

c- What do you consider the most effective activity of the intervention? (rate them from 1 to 4 in order of effectiveness, 1 the most and 4 the less)

- **Journal clubs**
- **Seminars**
- **Research course**
- **Mentorship work with ward managers**

Why?

d- What do you think has been the main contribution of:

- **Journal clubs?**

- **Seminars?**

- Research course?

- Mentorship work with managers?

5- What do you think should be the priorities for next year to develop a nursing research culture in the hospital?

6- Please, describe your general experience as a mentor

7- Is there anything else you would like to add?

Appendix 24 Ethical approval



Clínica Universitaria

Facultad de Medicina
Universidad de Navarra

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Comisión de Ética de Investigación

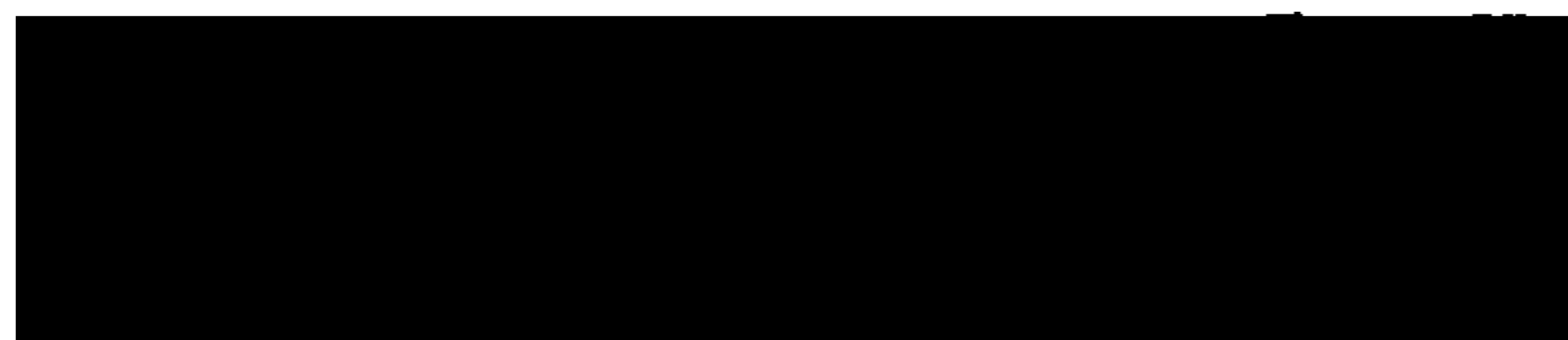
Doña PURIFICACIÓN DE CASTRO LORENZO, Doctora en Medicina, Secretaria de la Comisión de Ética de Investigación de la Clínica Universitaria de la Facultad de Medicina de la Universidad de Navarra,

CERTIFICA: que, en las sesiones ordinarias celebradas los días 24 de febrero y 8 de Marzo de 2005, la Comisión examinó los aspectos éticos del proyecto 15/2005, presentado por Dña. Silvia Corchón Arreche, titulado:

“Desarrollo y evaluación de una estrategia para fomentar la actividad investigadora de enfermería en la CUN”.

Después de evaluar el interés del estudio, y de considerar que la investigadora principal ha seguido las indicaciones de la Comisión referentes a, los consentimientos informados para grabación de voz y vídeo, se decidió autorizar el proyecto

Y para que así conste, expide el presente certificado en Pamplona, a ocho de julio de dos mil cinco.



Purificación de Castro
Secretaria

Appendix 25 Ethical permission from the University of Sheffield

R.J.Hudson@sheffield.ac.uk

Dear Silvia

I have read the documents you kindly provided re. the University Hospital of Navarre's ethics review procedure. In my judgment, as Secretary to the University of Sheffield Research Ethics Committee, the procedure appears to be sufficiently robust.

Therefore, the University of Sheffield recognises the ethics review procedure at the University Hospital of Navarre. I have copied Mrs Amanda Cowan into this email as she is the Ethics Administrator in the School of Nursing and Midwifery at the University of Sheffield. Amanda, please let me know if you don't have a copy of the ethics approval letter for your filing system, in respect of this remote location student).

Best wishes and good luck with your research.
Richard

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