

**Videotape review versus peer review for
evaluating communication skills used by
undergraduate dental students during a child's
initial dental consultation.**

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for the Degree of Doctor of Clinical Dentistry.

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***Dedicated to my family
My mother, father, husband and
daughter.***

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Abstract

Aim: The primary aim was to compare undergraduate dental students' preferences of videotape and observer peer review in evaluating undergraduate dental students' communication skills during child initial consultation. The Secondary Research aims were

1. To examine the intra- and inter-observer agreement of an established Paediatric Consultation Scale (PCAT) over a one-week period for evaluating a dental student consultation with a child-patient and their parent.
2. To assess the correlation between parental opinions concerning the quality of the consultation using a combination of the dentist-patient interaction tool and students' opinions.

Methods: A pilot study of (42) undergraduate dental students from Leeds Dental Institute together with 21 children and their parents participated in this study. Undergraduate dental students acted as either peer observers or consulting dentists. The consulting dentists conducted a first clinical visit appointment for the child and parent; the peer observers observed the consultation and recorded observations using a Paediatric Consultation Assessment Tool (PCAT). Following the completion of the consultation, the consulting dentist was asked to complete the PCAT scale to critique their own performance throughout the consultation. Furthermore, the parents were asked for their opinions of the consultation using the dentist-patient interaction tool. Finally, the consultation was videotaped by the researcher. One week later, the same peer observer and consulting dentists reviewed the videotape with the researcher. They completed a further PCAT scale, as well as a qualitative

questionnaire, with the objective to explore their feelings in terms of which method they preferred, video-tape review or peer review. **Results:** Using framework analysis the qualitative questionnaire was evaluated and showed that the students' prefer video review feedback. Cohen's Kappa was used to test the agreement between students and showed slight agreement. Spearman's rank correlation was used to test the correlation between the parental satisfaction and the students' opinion and showed weak correlation. **Conclusion:** The under graduate students preferred the video review over the peer review. However, the students failed to agree on the quality of the consultation and none of their opinion represented the parental opinion.

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1.0 Introduction and literature review:

1.1 Importance of communication skills:

Throughout history, the importance of communication skills has expanded in the people oriented professions. A regional survey of dentists' preference for hiring dental associates (Halley et al., 2008) showed communication skills to be as important as technical skills when choosing an associate.

The historical expansion of the importance of communication skills comes as no surprise. Communication skills and clinical competence have been shown to be co-dependent (Colliver et al., 1999). In the medical field psychosocial problems are common, yet they are missed in 50% of the cases (Freeling et al., 1985, Schulberg and BJ., 1988) Physicians can miss important concerns due to patient interruption. It has been shown that physicians can interrupt patients as soon as 18 seconds after describing their problem (Beckman and Frankel, 1984). The physician can fail to elicit 54% of patient complaints and 45% of patient concerns (Stewart et al., 1979), due to poor communication skills. The majority of formal complaints and practice allegations arise from communication errors and not technical medical/ dental errors (Shapiro et al., 1989, Richards, 1990).

Good communication can result in both physical and psychological positive health outcome. Allowing patients to express their concerns and showing them compassion can result in a significant fall in anxiety, even if the concern is not

addressed (Mac Leod, 1991). When patients are allowed to express their concerns without interruption, their blood pressure reduces significantly (Orth et al., 1987). Not only that, but good communication skills can lead to increased patient satisfaction, which can lead to better compliance and reduced formal complaints (Hannah et al., 2004).

Communication skills are not only the person's ability to communicate with others but also include the person's confidence, ability to listen to people and understand them. Their capacity to solve problems, manage themselves in stressful situations, and their capability to make decisions (Maguire and Pitceathly, 2002).

Communication is an art and in order for it to be effective, it has to include active listening where the dentist is listening and giving the patient feedback on what they heard, to ensure accurate understanding. Also, it is important to include effective data-gathering and data-imparting, an empathic approach when dealing with patients, a sense of ethical awareness and professionalism, and sensitive patient handling (Hannah et al., 2004).

These facts are very important in paediatric dentistry. Paediatric dentistry is challenging due to the fact that dentists have to communicate with two people (one adult as the parent, and one child as the patient). Dental anxiety is common in adults and children, and effective communication is the corner stone of alleviating such fear.

The dentist's communication skills can affect the child patient both directly and indirectly (through the parent). The dentist's ability to introduce themselves in a child friendly manner can help improve the child's cooperation by reducing their anxiety. The ability of the dentist to address the child's concerns and explain the

procedure can play an important role in managing children's behaviour. Good communication skills can directly increase the child's cooperation and can aid in successful completion of treatment, and encourage a lifelong positive attitude toward oral health.

Parents play a crucial role in the child's behaviour and hence the parents' behaviour can indirectly influence the child's attitude and behaviour toward dental treatment (Welbury et al., 2005). Essential, basic elements of everyday life are garnered by children through their parents/guardians, which is a practice termed 'socialisation'. Socialisation is a continuous process with notable long-term effects, thus having the potential to impact the ways in which children respond in the future. In this context, socialisation considers the ways in which children respond to dentists as a result of their parents' behaviours (Welbury et al., 2005).

If dental fear and anxiety is not controlled in childhood it can lead to avoidance of dental care and deterioration of dental health (Berggren, 1993). Maternal anxiety is an important aetiological factor in the child's dental fear (Klingberg et al., 1995). Consultation appointments offer a chance for the dentist to present themselves to the parent and provide information prior to dental procedures. A study looking into the effectiveness of pre-operative information on the reduction of anxiety of patients prior to invasive dental procedures under local anaesthetic, concluded that the provision of pre-operative information can significantly reduce patient anxiety (Ng et al., 2004).

Paediatric dentistry is the only specialty in dentistry that has been categorised based on the patients' age and not the technical skills required. The paediatric dentist needs to possess a set of behavioural skills to be able to complete a

child's treatment successfully. Good communication skill is the foundation of behaviour management. Hence, good communication skills are an imperative tool in the paediatric dentist's bag of tools.

Due to the importance of communication skill, the General Dental Council requirements of the dental curriculum from 1990 onwards comprised behavioural science teaching in their guidelines for undergraduate dental students.

1.2 Undergraduate dental students' attitude toward learning communication skills

Life as an undergraduate dental student can be tremendously stressful. Over the five year course, students have to acquire clinical, interpersonal, and academic skills (Plasschaert et al., 2005). A questionnaire, administered to undergraduate dental students in six different European countries, identified three different factors that the undergraduate dental students associated with stress; these are self-efficiency; performance pressure; and assignment work load (Polychronopoulou and Divaris, 2009).

One can only imagine that the performance pressure of undergraduate dental students can be amplified when they have to treat patients in vulnerable groups such as children. In many dental schools treating vulnerable groups such as children is time-tabled later in the course, once foundation skills including communication have been developed.

Even so, a recent cross-sectional research project by an undergraduate student at Leeds Dental Institute, investigated concerns' of dental students from

different year groups with respect to paediatric dentistry (Bank, 2007). Students were presented with a number of statements. To each statement they recorded their agreement on a Likert scale from 'strongly agree' to 'strongly disagree'. Each of these descriptors was assigned a value of 1-5 (e.g. strongly agree equalled 1 and strongly disagree equalled 5). As students' progress through their dental education (3rd to 5th year) they become more confident in addressing children. Students at the beginning of their paediatric dentistry exposure to clinic reported less confidence in their preparation to clinic than their more senior colleagues. Unsurprisingly with paediatric clinic experience students progressively became more confident with working with children. This project showed the need to support students in their early stages of paediatric training to alleviate their stress.

Support to the undergraduate dental students in their early stages of paediatric dentistry can take many forms. One of these forms can be through improvements in their communication skills. If the students accept and welcome the teaching of communication skills then it can afford them that support. However, if they do not accept it then it can increase on their work load and stress. Therefore, the dental students' attitude toward learning communication skills needs to be examined.

The importance of communication skills training to undergraduate dental students before and after the introduction of a mandatory communication skill workshop at Dunedin University was investigated (Hannah et al., 2004). The result showed that 83% of the students considered communication skills more important to their undergraduate curriculum after completing the work shop, with only 63% reported holding the same opinion prior to the work shop. The undergraduate dental students thought the work shop helped them develop new

communication skills, improved their confidence, and therefore increased their interest in the subject.

Even though this research gave an insight into the students' attitude to learning communication skills, one has to consider the possible bias created in the results. The students filled a single questionnaire to express their feeling on learning communication skills after commencing the work shop. Attending the work shop could have possibly influenced their original feeling on learning communication skills prior to commencing the communication skills workshop. Completing two separate questionnaires before and after the workshop could possibly provide better insight into the students' feelings about learning communication skills. Also, a small percentage of the students did not fill in the questionnaire which could possibly influence the end result.

A second study (Gorter and Eijkman, 1997) looked at dental students evaluation of three communication skills course at the University of Amsterdam. The first course took place at the end of year one and concentrated on basic communication skills. The second course was in year three and explored how the elements learned in year one could be implemented. The students watched videos of role playing and had the opportunity to interact with simulated patients. The third course took place in year four, It concentrated on real life situations where students videotaped themselves during a real patient consultation. The video was then reviewed and critiqued in small groups of students guided by a tutor.

The students completed an evaluation form after each course to evaluate it. The form was developed by the faculty at the University of Amsterdam, where each question was scored between 1 (extremely bad) or 10 (excellent). All Students

in all three years managed to complete the evaluation form. They found communication skill courses as useful, and relevant to their dental education, with a range of scores between seven and eight.

A cross-sectional study (Nor et al., 2011) undertaken in two Malaysian universities [University of Malaya (UM), and University of Kebangsaan Malaysia (UKM)], aimed to investigate the dental students' attitude toward learning communication skills, and the relationship between the students' attitude and their demographic and educational related characters.

The results showed that 88.1% of the students completed the questionnaire. Students overall had a positive attitude to learning communication skills. Females and younger students' had a higher positive attitude toward learning communication skills. Also, Students who rated themselves as good or excellent communicators had a higher positive attitude to learning communication skills than students who rated themselves as poor communicators. This could be possibly have contributed to a higher confidence in their communication skills and therefore they enjoyed the training courses more than their peers who rated themselves as poor communicators.

Overall, the students at the UKM had a significantly higher positive attitude toward learning communication skills than the students at the UM. This difference between the two universities could have been attributed to the significantly higher number of female students, and the significantly lower mean age of students at the UKM. Another factor that needs to be considered for such significant difference is the type of communication skills training offered in each university. In the third year UKM offered a one hour introduction to communication skills followed by two hours role play with simulated patients and a discussion. However, the UM offered a more extensive training extending

over five years. Therefore, there is a possibility that a prolonged teaching of communication skills can negatively influence the students' attitude toward learning communication skills. This was in agreement with another study (Kassebaum and Cutler, 1998).

The literature contained limited research about the dental students' attitude toward learning communication skills. However, the medical field has a number of research methods to explore the students' attitude toward learning communication skills.

A study by Rees et al. aimed to explore undergraduate medical students' views and experiences of methods of teaching and learning communication skills (Rees et al., 2002). The results showed that females were more positive than males when it came to learning communication skills. This finding was in agreement with the finding of Nor and co-workers study of dental students (Nor et al., 2011). Students in their early medical school years had a more positive attitude than students in their final year. This could be due to age difference. Some medical and dental studies have shown that younger students have a higher positive attitude toward learning communication skills (Kaufman et al., 2000, Rees and Sheard, 2002, Nor et al., 2011). Having said that other medical studies have found that students age did not significantly influence the students attitude toward learning communication skills (Wright et al., 2009).

The students have mixed feelings about learning communication skills in lectures. They preferred to learn communication skills through experimental methods, such as role playing with simulated patients or real patients in clinical situations (Rees et al., 2004).

The area of teaching communication skills to dental students is still under exploration. Overall, the students have a positive attitude toward learning

communication skills. The students' attitude toward learning depends on several factors. In general females and younger students' have a higher positive attitude toward learning communication skills. Also, student who have confidence in their communication skills have a higher positive attitude toward learning communication skills. The undergraduate students' attitude toward learning communication skills depended on the content of the teaching. They preferred shorter teaching that offered problem solving and experimental methods of teaching over lectures or didactic learning.

1.3 Acquiring communication skills in medicine and dentistry

A literature review by Aspegren showed an overwhelming evidence of the positive effect of communication skills training (Aspegren, 1999). Two consecutive studies (Evans et al., 1989, Evans et al., 1991) looked at the effectiveness of teaching communication skills in improving the medical students communication skills and improving their diagnostic efficiency. Sixty medical students were videotaped during history taking interviews. The students were then randomly assigned to control and test groups. The students in the test group received a communication and interview training course. The students in the control group were asked to complete an 11 hours of clerking to match the time the test group spent on the training course.

After the training course, all students in both the control and test groups were videotaped during a real patient consultation. The videos were then rated by two trained psychologists using a communication and history taking rating scale. Students in the test group received a significantly higher score. They showed a greater ability to discuss patients concerns, had better ability to use

silence, and had better use of question style (open vs. closed). The control group skills did not change with the 11 hours of clerking.

Of the 60 tapes recorded following the training course, 30 were randomly selected (15 from the test group, and 15 from the control group) to evaluate the students diagnostic efficiency. A psychiatrist and a general practitioner used a medical interview rating scale that consisted of five variables (introduction to interview, problem diagnosis, communication, summary of the interview, and overall rating) to independently evaluate the students' diagnostic efficiency. The two evaluators had an inter-rater reliability of 0.85. The students in the experimental group showed significantly greater diagnostic ability. This research shows that teaching communication skills could be effective in improving not only communication skills but also in improving the diagnostic efficiency of a consultation.

Campbell and co-workers (Campbell et al., 1996) looked at the effectiveness of a program aimed to increase medical students skills in counselling patients presenting for HIV/AIDS information. The study was a randomised control trial where students were assigned to either control or intervention groups. The intervention group had an interaction skills program on HIV/ AIDS in addition to their current curriculum.

The two groups were videotaped at baseline with simulated patients, then at three months, and finally a sub group was videotaped at 12 months. The videos were then evaluated by a single rater on a 76 item scale developed by the authors. Each video received two scores, one on HIV/AIDS test counselling and the other on general consultation skills. The scale inter-reliability was tested on

26 taped consultations. Items that rated a kappa value of less than 0.45 were excluded from analysis.

Eighty-eight students enrolled of which 80 were videotaped at three month and 33 students were videotaped at 12 months. The results showed that, between baseline and three months there was a significant improvement in the experimental group that was not detected in the control group. The results also showed that there was a significant improvement in the experimental group between baseline and 12 months but that the improvement was not significant between three months and 12 months. This meant that the benefit of the program did not drop after the first follow-up as the results were maintained between three months and 12 months.

A more recent dental study looking at the effectiveness of teaching communication skills took place at the University of Cologne, Germany (Haak et al., 2008). The objective of the study was to determine whether undergraduate dental students could improve their communication skills as a result of supervised patient care and whether a newly implemented communication course could further improve these skills.

All fourth year undergraduate dental students were assigned to either control or experimental groups. The two groups were randomly assigned with an even distribution of gender and communicative competence to reduce bias. Both the experimental group and the control group attended the same clinical courses. However, the experimental group had a newly developed communication course in addition to their curriculum. The course consisted of an introduction to communication skills, followed by reviewing real patient encounters on video,

and finally the students had a chance to role play and record themselves on video for a later review and discussion.

The students in both groups conducted two interviews with real patients at the beginning and at the end of the year, a total of four videos per student. At the end of the year, all videos were evaluated by three lecturers trained in doctor patient communication. They used the revised Calgary-Cambridge concept (CCOG) to evaluate the videos. Each video was evaluated by all three evaluators and the average rating was used.

The results showed a significant improvement in communication skills in the experimental group at the end of the year. Whereas the control group communication skills did not show any significant improvement at the end of the year.

Hottle and Hardigan carried out a study to observe and document the effect of a course in patient management on improving communication skills of all 100 third years dental students at the Nova Southeast University (Hottle and Hardigan, 2005). All third year dental students were observed with real patients in consultation before and after they had attended a 35 hours instructional and experiential course in patients' management and improving communication skills. Ten psychology postgraduates observed and evaluated the students.

Of the 100 students 78 were included and 22 were excluded. Excluded students had failed to either have a pre or post-course evaluation, or they failed to complete the course. The excluded students' demographic and academic performance was not different from the included students. The result showed a significant improvement in all items after the course ($p < 0.0001$). The greatest effect was shown in attending to patients' nonverbal behaviour, ability to

decrease patients' anxiety, and focusing on listening to patients. However, maintaining eye contact showed the least improvement. This study showed that patient management and communication skills could improve dental students' communication skills.

All the previously mentioned studies lacked blindness of the evaluators (Evans et al., 1991, Campbell et al., 1996, Hottel and Hardigan, 2005, Haak et al., 2008). The lack of blindness could have possibly negatively influenced the evaluations of the control group and at the same time positively influenced the evaluations of the experimental group. The Hottel and Hardigan study was the only study in which blinding was not possible due to the study design. The students were evaluated through a real life observation whereas the other studies videotaped the students for observation. Having said that, teaching communication skills is valuable and the evidence is present and strong.

Goldrick and Pine surveyed dental schools in the United Kingdom to review the teaching of behavioural science (Goldrick and Pine, 1999). They found that 13 of 14 dental schools offered behavioural science teaching. The behavioural science teaching methods varied between the different schools. The primary method of teaching was through traditional didactic learning (lectures). The qualification of the person responsible for the teaching also varied.

According to a literature review by Aspergen there was a conflict in the literature on who could teach communication skills (Aspegren, 1999). Some studies had found social scientist to be more effective in providing behavioural science teaching, while other studies found general practitioners to be more effective. Instructed patients, (where they could play the role of a patient, evaluator, and a teacher), had been rated highly by medical students. Also, practising doctors

could review themselves after being recorded and learn from that. This led to the conclusion that it was not important who taught behavioural science, rather that the content of the training program is more important (Aspegren, 1999).

Behavioural science can be taught through two different methods, traditional (didactic) or experiential. In the traditional methods, the students normally receive information about behavioural science either through lectures or observations. Following that they could use the information without feedback. In the experiential method, the students had their encounters reviewed by the teachers and they received feedback. The literature showed that experiential teaching of behavioural science was more effective than the traditional method alone (Aspegren, 1999). Furthermore, the students preferred the experiential method to the traditional method (Rees et al., 2004).

Communication skills can be acquired. The best way to teach communication skills is through experiential methods. A survey (Goldrick and Pine, 1999) investigated the methods of teaching communication skills in the UK. At the time of the survey dental schools in the UK were not using enough experiential methods. A new survey was needed to determine if the teaching of communication skills had improved and changed to be more experiential in nature.

1.4 Videos as a teaching tool in the literature.

Throughout the 1950s through to the 1970s, there was much attention directed toward how the visual media could be utilised to rouse learning. This interest was believed to be attributed to the expected lack of teachers available to an increasing population (Cohen et al., 1981). Visual media instruction can have several applications such as still projections, film, multimedia, educational television, use of video for observation, and feedback.

The effectiveness of visual media-based teaching was compared to conventional teaching in a meta-analysis (Cohen et al., 1981). The meta-analysis aimed to look at the available literature to understand if visual media was an effective teaching tool. Also, they examined where it was used and who benefited from it.

To achieve their aim, they expressed the outcome of the studies, included in the meta-analysis (74 studies), in quantitative terms. The findings of the studies were described in five areas; these were achievements, retention, correlation between students' aptitude and achievement, students' attitude toward visual based instruction, and visual-based instruction effect on completion of the course.

The results showed no significant difference in learning outcome between the two methods except in the area of achievements. Visual media-based teaching had a significant positive effect on students' achievements especially when it was used in the form of videotape feedback. As a result it was suggested that the use of visual media-based teaching in the area of feedback was promising and it should be studied further (Cohen et al., 1981).

The use of videotapes provides a practical way of observing students directly (Davis and Dans, 1981). Direct observation subsequently offers educators the potential to focus on a number of key areas such as: data collection, students' mannerisms, appropriate methods of questioning, and how patients' comfort can be facilitated. Also, the students are provided with the opportunity to review their own performance, thus facilitating a more valuable critique and encourage changes where necessary. In addition, it is also recognised that when an abundance of video tapes are gathered from students, these videos tapes can then be used to establish any oversight or errors in regard to the curriculum or students attendance. This then facilitates consideration of ways in which the approaches to clinical skills' teaching can be standardised (Scheidt et al., 1986).

A randomised control trial investigated if the use of video tape feedback is superior to verbal feedback alone in the teaching of communication skills (Ozcakar et al., 2009). Fifty-two second year medical students participated in the study. The students were randomly assigned to a control group (25 students) and a study group (27 students). The two groups were initially observed during a consultation with a simulated patient, through a two way mirror by an assessor. The assessors were four family medicine department staff with an inter reliability Kappa of 0.9. The assessor used an instrument (developed by the authors) with an acceptable reliability to score the students' performance (Cronbach's $\alpha=0.77$). The study group was videotaped during the consultation and had the opportunity to review their video and receive feedback from the assessor. The control group received verbal feedback only from the assessor. After 15 days, both groups interviewed the patients again and were scored by the assessors using the same instrument.

The results showed there was no significant difference in gender or age between the two groups. The students' scores in both the control and the study group increased in the second interview. In the study group the increase in score was significantly different in all areas of the instrument. However, the increase in the control group was not statistically significant except in the area of mean history taking.

The study was small in sample size, and no power calculation was produced. Also, the assessors were not blinded which can introduce a bias in the assessment of the second interviews. The instrument used had an acceptable reliability, which can affect the results. However, the same instrument was used for both groups. The conclusion drawn from this study was that video tape reviews were superior to verbal feedback alone in improving communication skills of undergraduate medical students.

Several studies in the literature examined the effectiveness of video review. A literature review by Hammoud and co-workers aimed to determine if video review of students performance with patients in clinical areas was an effective tool for medical students learning (Hammoud et al., 2012). The review included 67 articles from different data bases. The studies included had various designs, outcomes and qualities. The majority of the studies focused on communication skills, but some also looked at physical examination or other technical skills.

Sixty-two of the studies concluded that the video review was a useful method and found a high satisfaction rate among the students. The studies that found the use of video review not to be useful lacked in control groups, which decreased their value. The authors concluded that the use of video review was an effective and powerful tool for learning. They recommended that the video

reviews should include both student self-assessment and faculty feedback for a more effective criticism.

Even though videotape feedback has been considered as a valuable teaching method to improve students' clinical skills, it is still rarely used (Roter et al., 2004). One reason to be considered, is the fact that students find being videotaped to be a stressful experience (Paul et al., 1998).

A study was carried out to clarify the acceptance of video-based teaching in paediatric dentistry by undergraduate students (Kalwitzki et al., 2003). Five classes of undergraduate dental students (160 students) over a two years period participated in the study. The students were videotaped with real patients during a dental appointment. A day after the dental appointment, the videotaped undergraduate had the chance to choose a 10 minute realistic section of the videotaped dental appointment to watch with a peer group of eight undergraduate students. Skills demonstrated were then discussed for 15 minutes.

After the completion of their clinical course in paediatric dentistry, the students were asked to fill in a questionnaire. The questionnaire was developed after a pilot study and used a likert scale. All but three students' questionnaires were excluded due to failure to complete the questionnaire.

The majority of the students welcomed the use of videos as a teaching methods in paediatric dentistry (95.5%), and 63.1% suggested the need for a wider use of video in dental education. 79.1% of the students felt videos of previous dental students should be shown to students before the start of the paediatric dentistry clinical course.

The students found their own videos as well as other students' videos to be very interesting as it gave them new insights into their behaviour with patients. The students were convinced that these insights could change their behaviour with patients either immediately or in the future. A small number of students felt uneasy because they were watched by their class mates (10.8%), and others felt the treatment quality was negatively affected because of the presence of video camera (13.8%).

In general the answers by males and females correlated well but some differences were found between the two genders. Males seem to welcome the wider use of videos as a teaching method, more than females. A higher number of the female students felt uneasy about being videotaped, and therefore felt the videotaping affected the treatment.

This research used a large sample of students over a two year period and therefore provided a good insight into the students' acceptance of being videotaped especially in paediatric dentistry.

A focus group qualitative study explored students' opinion of videotape feedback with the aim of improving this type of teaching method (Nilsen and Baerheim, 2005). Final year medical students were videotaped consulting real patients in an emergency room. A few days later, students met in small focus groups of six-seven to discuss their performance with each other and with a mentor supervisor. They also discussed their opinions and concerns of the type of teaching method.

Prior to this teaching, students were concerned about being videotaped. Their concerns included carrying out the consultation in an unfamiliar atmosphere. Also, they were embarrassed to watch themselves on video with other

classmates. They feared that the video would show that they were lacking in medical knowledge and perhaps their fellow students would think of them as inadequate. If they were judged inadequate, then they felt it was too late to improve their performance as they were in their final year.

After the videotape feedback session, students realised that their fears had no grounds. This could be possibly because of the way the feedback was carried out. Some students gave positive comments on the feedback methods. They thought the advice was worded carefully and respectfully in a constructive manner and always ended with a positive feedback, which helped to decrease the chance of embarrassments. In addition, students found it easier to agree on the advice after they watched themselves on videotape. The feedback was carried out in small groups where everyone showed the same experience with a positive attitude. This provided an environment where criticisms were likely to be accepted. Moreover, the videotape consultation seemed to strengthen some students' self-esteem. Before the videotape feedback session some students were very self-critical of their consultations. However, after the videotape feedback session they realised they had done better than they thought initially.

This again points out the value of videotape in teaching especially in the area of feedback. This type of teaching is sensitive and needs to be carried out carefully in order to obtain its maximum benefits. Nilsen and Baerheim suggested that the videotape feedback should be introduced early in students' curriculum, to decrease the student concerns later in the course.

In general, the use of video as a teaching tool is widely accepted by students. A small number of students did not accept it as a teaching tool mainly due to fear of embarrassment, or because they thought the video camera interfered with the quality of treatment they provided. If the students were introduced to the

video as a teaching tool early in their curriculum with constructive feedback, their fear of embracement were likely to decrease, and the presence of video camera was less likely to interfere with the quality of treatment they provided.

The use of video as a teaching tool is an effective method of teaching especially when used to provide feedback (Black and Wiliam, 1998, Fluckiger et al., 2010, Hammoud et al., 2012). Feedback is essential to effective learning and has even been linked with motivation (Dweck, 2000). Video feedback offers the opportunity for direct observation (Davis and Dans, 1981) and is superior to verbal feedback (Ozcakar et al., 2009). Undergraduate students generally have a positive attitude toward the use of videos feedback as a teaching method (Kalwitzki et al., 2003, Nilsen and Baerheim, 2005).

1.5 Communication skills Rating Scales within the Literature

Since the General Dental Council included behavioural science teaching in their 1990 guidelines, a scale to assess communication skills were called for. Assessing communication skills is a complicated task, and cannot be established by the presence or absence of specific behaviours; more properly, it relies on the ability to adjust and respond to given situations. Therefore, developing a scale for the evaluation of communication skills in terms of dentist-patient interaction is complex, and thus requires significant effort.

The literature includes several models of what is considered to be the essential elements of patient/ physician interactions (Haak et al., 2008). These models serve as a scaffold for the physicians to structure their interaction with the patients. Furthermore, these models can be used to develop a curriculum to

enhance communication skills, and to develop a communication skills rating scale. Some of these models are:

- 1) Brown interview check list (Novack Dh, 1992).
- 2) Calgary-Cambridge guides (Kurtz and Silverman, 1996).
- 3) Kalamazoo consensus statement (Makoul, 2001a).
- 4) MAAS global (Van Dalen et al., 1998).
- 5) Macy initiative in health communication model (Kalet et al., 2004).
- 6) Patient centred clinical method (Stewart, 2003).
- 7) SEGUE framework (Makoul, 2001b).
- 8) Three functional models (Cohen-Cole, 1991).

The majority of the rating scales mentioned in the literature, have been developed in the medical field, with very few in the dental field. Having said that, communication skills needed in both medical and dental fields have few differences, and therefore many communication scales developed in the medical field can be adapted in the dental field.

A literature review of the communication assessment scales between the periods 1989–1996 identified 44 scales (Boon and Stewart, 1998). These scales were developed in the medical field. The scales collected had different uses; and few have been validated. However most of the scales collected were found to be reliable. Having said that, the authors found that few scales have been compared to each other directly. Boon and Stewart suggested the need for further validation of existing scales by comparing them to each other, which can give a better indication of validity.

A more recent literature review aimed to evaluate the degree to which available communication assessment scales, measured the essential elements of

physician communication skills (Schirmer et al., 2005). Fifteen scales were collected, and evaluated using a rating scale developed by the authors. The scale evaluated the ability of the scales to test the primary evaluation criteria mentioned in the Kalamazo consensus statement (Makoul, 2001a). It looked at whether the scale addressed family issues, tested interview efficiency, and documented psychometric properties. Furthermore, the usability of the scales was rated, and overall rating was given to each scale.

The result showed a considerable amount of variation between the scales. None of the scales received a high score in all rating areas, which emphasizes the variation between the scales. Having said that, this literature review was a pilot study with limited numbers of scales, and therefore a more extensive literature review was needed to validate the result.

Some literature reviews (Boon and Stewart, 1998, Schirmer et al., 2005), demonstrated the need to study the available scales in the literature, and improve on them, rather than developing a new communication skill scale.

For the purpose of this study, identification of a scale that can be used by an observer in direct observations reviewing a videotape recording is needed. Furthermore, the reliability and validity of the scale needs to be established. In order for the scale to be considered usable, it should be available in the literature and adaptable to the arena of dentistry and preferably in paediatric dentistry.

The identification of five scales was possible. Four scales were developed in the medical field (Arizona Clinical Interview Rating Scale; SEGUE Framework for Teaching and Assessing Communication Skills; the Common Ground scale; and the Paediatric Consultation Tool (PCAT)), and one developed in the dental

field (Dental Consultation Communication Checklist (DCCC). A summary of the description of the communication skills scales is shown in table 1.1.

The Dental Consultation Communication Checklist (DCCC) (Theaker et al., 2000), comprises five categories: Introduction (5 items), Case history (12 items), Examination (8 items), Closing (3 items), and the Patient (3 items). Each item is rated on a seven-point Likert scale, with anchors 'least evident' ranging through to 'most evident'. The face validity (defined as the relevance of a test as they appear to tests participants) of the check list was assured during the development. This took place through observing clinical/ patient interactions in an oral medicine clinic, to check that the overall communication within a consultation was represented in the check list.

Consensual validity (mutual agreement by two or more, that a test measured what it was supposed to measure) was tested by distributing the check list to consultants and lecturers for comments and possible correction.

Two independent observers rated the performance of 43 third-year dental students while treating patients in oral medicine. The reliability between the two observers was tested using Cohen's weighted Kappa. The mean total score for each observer as well as for individual items in the check list were compared for agreements. There was no significant difference between the observers mean total score (observer 1= 118.42. observer 2= 118.00). There was almost a perfect agreement for item specific Kappa except for four items:

- Summarising and reflecting (inter-observer Kappa= 0.77)
- Making eye contact (inter-observer Kappa= 0.60)
- Showing interest and evidence of testing (inter-observer Kappa= 0.79)

- Patients freely offering information (inter-observer Kappa= 0.75)

Even though the four items did not show perfect agreement, they did show substantial agreement. The DCCC check list is a reliable tool to test the communication skills during a dentist/ patient interaction. Furthermore, the check list was available in the literature and is easy to use. However, it might be difficult to use it in a paediatric dentistry setting without significant modifications as it concentrates on adult patients and does not consider the presence of other family members such as parents. Parents play a huge role in paediatric dental consultations.

One of the first communication skills rating scales developed in the medical field was the Arizona Clinical Interviewer Rating Scale (ACIR)(Stillman et al., 1977), which comprised of six major subsections: organisation, time line, transitional statement, questioning skills, documentation of data, and rapport. The total number of items in the scale was 16, with each item scored on a five-point Likert scale ranging from 'poor' to 'excellent'. The inter-rater reliability was measured by two mothers and a paediatrician. The two mothers were interviewed by a medical student; the interview was videotaped. Two weeks later, each mother reviewed and rated the other's interview. In addition, a paediatrician also reviewed and rated each video. The inter rater reliability yielded a coefficient of 0.87 computed by Ebel's method. The intra-rater reliability was measured; each mother reviewed her own videotape two weeks later, unaware they would need to evaluate the videotape in the future. The intra-rater reliability resulted in a coefficient of 0.9 for one mother and 0.85 for the other. This suggested near perfect agreements. Although they used one

video tape to test inter-and-intra rater reliability. Possibly a number of different videos might have produce different results.

The validity of the ACIR scale was confirmed by answering Saber's and Whitney's five questions (Sabers and Whitney, 1976):

1) Does the scale measure what it should? (convergent validity)

This was accomplished by comparing the scores of two groups of undergraduate medical students. The two groups received the same education except one group had already gone through the paediatric clinical clerkship and the other group did not. The students in both groups were scored during a patient/physician interaction using the ACIR scale. The group that did go through paediatric clerkship scored significantly higher (mean= 55.1) than the group that did not (mean=47).

2) Does the scale measure what it should not? (discriminative validity)

The scores for the ACIR and the Medical College Admission Test (MCAT) were correlated for two groups of medical students. No significant correlation was found between the two, and therefore it was concluded that the ACIR scale did not measure medical aptitude.

3) What condition produces changes in score?

Three different studies took place to look at the effect of instruction on the ACIR scale scores. The results showed that changes in the ACIR scale score corresponded with changes in the instruction.

4) Does the scale measure more than one thing? (internal consistency)

Two large groups of medical students were evaluated using the ACIR scale. The internal consistency was tested using Cronbach's alpha, to measure the homogeneity. The result reflected internal coefficient consistency of 0.79 and 0.80. Therefore it could be concluded that the ACIR showed internal consistency.

5) What else should be known about the scale?

Inter-and-intra rater reliability was tested and was reliable. However, the inter-and-intra rater reliability needs to be tested every time the rater changes.

The Arizona clinical interviewer rating scale had shown inter-and-intra rater reliability. The reliability of the instrument has to be interpreted carefully as it was tested on only one videotaped consultation with only two subjects. A larger sample size could have produced a different result. The scale had shown construct validity, but as mentioned in the previous scale it was developed to be used with adult patients and would need considerable modification to be adapted for paediatric dentistry.

The SEGUE Framework for Teaching and Assessing Communication Skills (Makoul, 2001b) consists of six major categories: Set the stage (5 items), Elicit information (10 items), Give information (4 items), Understand patients' perspectives (4 items), End encounter (2 items) and (if suggested) a new or modified treatment/prevention plan (7 items). Each item was simply scored through nominal YES/NO.

The inter-and-intra rater reliability was tested. Two participants (described as naïve) received intensive training for two hours on how to use the SEGUE

framework. After the training, they were asked to evaluate 52 video tapes of physician/patients interactions using the SEGUE frame work. To ensure diversity, the videos were a mix of residents/patients encounters, and medical students/ standardised encounters. The average score for each observer was calculated and inter rater reliability was tested using coefficient Kappa K_n and yielded $K_n=0.93$ suggesting a near perfect agreement.

The concurrent validity of the SEGUE scale was also tested. A number of standardised patients (number not specified) were asked to evaluate 48 medical students during their encounter with the students. The evaluation took place by using the SEGUE frame work, with an additional question “would you choose this student to be your doctor” accompanied by a five point likert scale ranging from 1= definitely not to 5= definitely yes. The final question was added as a measure of patient satisfaction. The correlation between the added question and summary of the SEGUE frame work score was tested using Pearson’s correlation coefficient and yielded a positive correlation of $r=0.65$. They concluded that this test assured concurrent validity. However, it was clear that the correlation was less than perfect, which meant there was variation between the standardised patients in the way they assessed the consultation, which raises concerns of the accuracy with which they rated the students.

The Common Ground scale (Lang et al., 2004) comprises six categories: Rapport, Information management, Eliciting all agenda, Active listening, Addressing feeling with patient and Reaching common ground—all with descriptors for each item in the main categories. Each item in the main category was scored on a five-point scale, with 5 being ‘exemplary’ and 1 ‘needs

improvement'. At the end of a category, an overall score was provided, with a global rating at the end.

The inter-and -ntra- rater reliability was tested for the Common Ground scale. Two schools participated in the study. One school offered minimal teaching in communication skills and the other school offered an intensive teaching of communication skills. A Cohort of 25 first year medical students and a cohort of 25 fourth year medical students were recruited from each school. Each student was videotaped during a consultation with four different standardised patients. The videos were then scored using the Common Ground scale by two trained rates. The raters were blinded to the year and school of each student. Each video tape received two scores one from each rater.

The inter-rater reliability was tested using Pearson's correlation coefficient for the various overall scores for each category and the overall case. The results showed great variation in inter-rater reliability ranging from $r=0.49$ (rapport building) to $r= 0.97$ (addressing feelings).

To test the intra-rater reliability, the raters were asked to rescore 10 randomly selected videotapes using the Common Ground theory. The agreement between the two scores for each rater for each overall category was tested using Pearson's correlation coefficient. The results yet again showed variation in intra- rater agreements, ranging from $r= -0.12$ (rapport) to 0.90 (active listening) for rater number one, and $r= 0.23$ (common ground) to $r=0.87$ (overall) for rater number two.

They concluded that the Common ground provided sufficient reliability. However, the ranges in agreements in inter- and intra -rater reliability was wide and suggested a less than sufficient reliability.

To test the construct validity of the Common ground scale, the scores of first year medical students in the school with minimal communication skills teaching and the first year medical students' at the school with intensive communication skills teaching, were compared. The result showed that the first year dental students' at the minimal communication skills training had significantly higher scores than the first year dental students at the intensive communication skills training school. However, fourth year dental students at the school with intensive communication skills teaching scored significantly higher than the first year medical students in either school. This suggested that the Common ground scale was contractually valid, because one would expect the scores to be higher after intensive training in communication skills.

Finally, the Paediatric Consultation Assessment Tool (PCAT) (Howells et al., 2010) (Figure, 2.3), which is divided into eight categories—Content skills, Relation-building, Initiating the session, Gathering information, Physical examination, Explanation and planning, Closure, and Structuring the interview—includes a descriptive marking key for each item within each category. At the end of the each category, there is an overall rating for both the parents and children, with a tool for establishing the overall rating for both the parents and child at the end. Moreover, each item has additional space for comments or observations. The scoring was on seven point scale with anchorage 1, 3, 5, and 7, with one being the worst and seven being the best.

The reliability of the tool was measured by videotaping paediatric consultants and specialist registrars during a consultation with patients (mean age: new born-16 years old) and their parents. A hundred and eighty-eight consultations with 19 paediatricians were video recorded for a median of 10 consultations per

paediatrician. The videotapes were then viewed and assessed by 17 different paediatricians. The assessor paediatricians received training on the use of PCAT for 90-120 minutes.

The scores from the PCAT items were combined to produce one aggregate score per consultation per assessor. Also, they produced aggregate score for adults and for children. Generalisability (G study) analysis in SPSS v.13.0 was used to determine reliability coefficient (R). Generalisability (G study) is a statistical method to examine the reproducibility of measurement under specific conditions (Brennan, 2001). The results showed that two consultations assessments per physician were needed to have an overall reliability of $r=0.80$ of the physician's performance during a paediatric consultation. As the number of consultations per physician increased the reliability increased.

Using the same consultations and scores the construct validity of the PCAT score was demonstrated. Following the consultations the paediatrician identified three hypotheses from their observations. These were:

- 1) Items related to clinical skills score higher than items related to communication skills based on the fact that medical school training focuses on clinical skills rather than communication skills.
- 2) Items related to doctor-parent interaction score higher than items related to doctor-child interaction (which was justified by the fact that none of the clinician's sample had any specific children-centred communication training).
- 3) adult-oriented items—especially information-sharing—scored higher than respective child items (notably, paediatricians would normally spend more time

with the child during relationship-building and less time during information-gathering).

The scores were collated for these different components of the PCAT score and were compared to the hypothesis. There was good correlation between the hypothesis of the experienced paediatricians and the score given.

The PCAT scale will be used in the current research due to its perceived validity, reliability, and also owing to the fact that it can be adapted to dentistry. The PCAT is available in the literature, and can be used by an observer in direct observations or through videotape recording. Furthermore, the tool has a descriptive marking key, thus making it easier for the observer to score the clinician with minimal training. Importantly, it would have been preferred to use a tool with inter- and intra-rater reliability, but the PCAT is the only tool in the literature to measure clinicians' communication skills with the parent and child simultaneously but separately in a paediatric setting.

Table 1.1 Summary of the communication assessment scales included in section 1.4.

| Instruments from the medical field. | Description of the instrument | Rating type. | Reliability | Validity | Comments |
|--|--|--|---|---|--|
| Arizona Clinical Interviewer Rating Scale | Six major subsections: organisation, time line, transitional statement, questioning skills, documentation of data, and rapport. Total number of items 16. | Five-point Likert scale and anchoring statements ranging from 'poor', to 'excellent'. | Ebel's method: Intra-rater= 0.85-0.90 Inter-rater=0.87 | Construct validity demonstrated. | -Reliability questionable due to sample size. -Needs significant modification to be used in paediatric dentistry setting. |
| The SEGUE framework | Six major categories: Set the stage (5 items), Elicit information (10 items), Give information (4 items), Understand patients' perspectives (4 items), End encounter (2 items) and (if suggested) a new or modified treatment/prevention plan (7 items). | Nominal YES/NO | Inter-rater kn= 0.93 Intra-rater kn= .99 | Concurrent validity weak. | -Weak concurrent validity. -Possibly needs long training -Needs significant modification to be used in paediatric dentistry setting. |
| Common Ground Instrument | Six categories: Rapport, Information management, Eliciting all agenda, Active listening, Addressing feeling with patient, and Reaching common ground. Included an overall for each category and global rating for the consultation. | Five-point scale, with 5 being 'exemplary' and 1 'needs improvement' | Inter-rater r=0.49 to r=0.97 Intra-rater r=-0.12 to r=0.90 | Construct validity demonstrated | -Weak reliability -Needs significant modification to be used in paediatric dentistry setting |
| Paediatric Consultation Assessment Tool (PCAT) | Eight categories—Content skills, Relation-building, Initiating the session, Gathering information, Physical examination, Explanation and planning, Closure, and Structuring the interview. Also, an overall score for each category and a global score. | Seven point scale with anchorage 1, 3, 5, and 7. 1= the worst and 7 = the best. | Generalisability r=0.80 | Construct validity demonstrated. | -Lacks inter- and intra-rater reliability, but Generalisability reliability demonstrated. -Suitable for paediatric dentistry setting. |
| Instruments from the dental field | Description of the instrument | Rating type | Reliability | Validity | |
| Dental Consultation Communication Checklist (DCCC) | The list comprises five categories: Introduction (5 items), Case history (12 items), Examination (8 items), Closing (3 items), and the Patient (3 items). | Seven-point Likert scale, with anchors 'least evident' ranging through to 'most evident' | Interrater: Cohen's Kappa 0.60-0.99. | Face validity Consensual validity both tested. | -Needs significant modification to be used in paediatric dentistry setting |

1.6 Patient satisfaction questionnaires

It is recognised that, in the context of dentist performance, clinical consultation is challenging in a number of different ways. For instance, it is acknowledged that there are a number of dental and technical elements involved in good consultation, which can be measured by other dental practitioners. Nevertheless, it is also understood that patients and their families are in a good position to judge a number of the fundamental elements in terms of the dentist-patient interaction (Crossley et al., 2005).

In a paediatric setting, parents are active participants in their child's treatment from a legal perspective as well as from compliance perspective. The parents' perception of the physicians' communication skills during a consultation can be obtained from real parents or elicited from standardised patients. Standardised patients have the advantage of being able to reproducing the problem reliably, and provide immediate feedback. Also, a reliable measure of a physician's performance can be obtained with smaller numbers of interviews. However, standardised patients are not real and can't provide different patients perspectives. They require training and payment and children are rarely available or sufficiently mature to act as standardised patients (O'Keefe, 2001). Real patients offer realistic clinical situations, and realistic evaluation. They do not require training or financial reward and require less organisation. However, , to obtain a reliable measure of a physician's performance, a larger number of consultations are required (O'Keefe, 2001).

Cooper and Mira compared the assessment given by standardised patients and the assessment given by teachers for the same consultations (Cooper and Mira, 1998). The results showed a strong positive correlation between them but the

skills were considered important by the teachers were different than the skills considered important by the standardised patients. A second study looked at the standardised patients assessment of physicians during a consultation compared to real patients assessment of the same consultation (Tamblyn et al., 1994). The result showed that the standardised patients assessment were similar to the real patients assessment with a positive Pearson's correlation coefficient of 0.60. The only difference detected was that the standardised patients gave a lower score to the physicians compared to the real patients, in other words the standardised patients were harsher critics. This led to the conclusion, that teacher, standardised patients and real patient assessments had a positive correlation. However, standardised patients gave a better insight into what real patients considered important communication skills.

There are several practical uses for the patients' perception of the physicians' communication skills. The patients' perception can be used to evaluate the physicians' communication skills, and to evaluate communication skills teaching programs. A number of randomised control trials, showed the effectiveness of a communication skills teaching program by obtaining the patients' satisfaction (Lewis et al., 1991, Evans et al., 1992, Clark et al., 1998, Smith et al., 1998).

Some studies failed to show an improvement in patients' satisfactions after, the completion of communication skills teaching programs (Brown et al., 1999). This can be interpreted in two ways. Either the communication skills teaching program was faulty due to deficiencies in the program, or the patient satisfaction tool might not be sufficiently sensitive. This shed light on the importance of the sensitivity of a patient's satisfaction tool.

The importance of real patients' perception of the physicians' communication skills is well known, but it is also important to look at the acceptability of the

parents to be part of the physicians' evaluations and to understand the physicians' acceptability of the real patients' involvement. A survey of 266 patients aimed to assess the patients attitude toward being involved in the training and assessment of trainee doctors (Bain and Mackay, 1995). The result showed that 80% of patients were very positive and comfortable with participation in physicians' evaluations. However, the literature is lacking in studies that examines the physicians' attitude toward being evaluated by real patients. This is an important issue to address and study. If the physicians refuse to accept the patients' perception of their performance, then obtaining the patient perception would be useless as the physicians will not embrace it.

There are many different measures for evaluating the satisfaction of patients which are markedly unrelated to particular conditions or which otherwise comprises a valuable element unrelated to the perceptions of patients in terms of the physician-patient relationship (O'Keefe, 2001). In addition, there are a number of tools designed to be used by either teachers or standardised patients; these tools are unsuitable for use by real patients because they either require a degree of training or otherwise need to be simplified in order for real patients to understand them. The satisfaction tools designed for real patients are usually developed for adult patients. Very few scales were developed to measure the child's satisfaction in a paediatric setting (Rifkin et al., 1988, Simonian et al., 1993), but even these scales included child centred questions that assessed the physician-child interaction and not the physician-child-parent interaction.

For this research project we needed a satisfaction rating scale that was relatively short, and easy to use. The rating scale needed to be available in the literature. The scale needed to measure parental satisfaction in paediatric

consultation sessions and needed to be adaptable to dentistry. As mentioned earlier, parents are active participants in the child's treatment and they also act as observers. The parents have the capacity to assess the dentist interaction with adult and children, whereas children might lack the sufficient maturity to assess the interaction between the dentist and the parent.

A search in the literature established a satisfaction instrument devised by Crossley *et al.* (Figure, 2.4) to assess the paediatricians' communication skills by children and caregivers (Crossley *et al.*, 2005). The authors used an assessment model for the clinical consultation that was constructed in a previous study (Crossley and Davies, 2005), to develop the satisfaction instrument.

The satisfaction instrument contained 15 items, each of which rated the doctor's performance on a five-point scale, with anchors of '1: The worst I can imagine', to '5: The best I can imagine'.

The reliability of the instrument to assess the performance of a doctor during a consultation was tested using the Generalisability theory (G study). Sixty-two doctors and 352 consultations were used to test the reliability of the instrument. Adults completed a satisfaction questionnaire for 352 consultations and children completed a satisfaction questionnaire for 126 consultations of 352. Reliability coefficient (R) was used.

The results showed that adults made fairly consistent judgment of doctors. Fifteen ratings were needed to have a general view of the doctors' performance with a reliability coefficient $G=0.7$ (15 ratings were 70% representative of the views of all adults about that doctor). Whereas the reliability of the children's

(age between 7-16 years) rating for the doctors' performance were idiosyncratic and reliability was very poor ($G=0.36$ with 15 raters).

Crossley's satisfaction questionnaire was specifically developed to be used in a consultation session including the parent/caregiver and their child as a patient. In addition, the rating system was relatively short, and the language could be understood by a layperson, which made it easier for the parent/caregiver to complete with minimal instruction. The rating system had items which were comparable to some items of the PCAT; this would help to facilitate comparison and analysis of the results. Finally, the rating system was reliable when completed by adult parents, and for these reasons it was thought that this rating instrument would be the most suitable for this research project.

1.7 Communication Skills: The Current Curriculum at University of Leeds

Leeds Dental Institute's undergraduate dental curriculum places great importance on teaching undergraduate students communication skills through several different methods. In the first year, students are introduced to basic communication skills, types of communication, and what is considered to be good or bad communication through a two-day workshop. In the second year, students are taught effective vocal skills and are made aware of cultural and religious differences. Furthermore, they are also delivered a confidence-building exercise. During the third year, communication with the dental team is added and integrated into clinical skills courses. The fourth year involves students starting to understand barriers to effective communication in-depth, and is

where topics such as communication with the elderly, medically compromised families, aggressive patients and children are all discussed and integrated into human disease and child-centred dentistry courses. Finally, in the fifth year, students cover a number of topics including communication for general practice, communication with other professionals, difficult situations, and interview techniques.

Behavioural science and communication skills are taught through lectures, simulated patients, video feedback and small group tutorials throughout the five years of undergraduate studies. Most of the teaching is with adult-simulated patients.

1.8 Aims of the study:

1.8.1 Principle Study aim:

To compare students' preferences of videotape and observer peer review in evaluating undergraduate dental students' communication skills during child initial consultation.

1.8.2 Secondary Research aims:

- a) To examine the intra- and inter-observer agreement of an established Paediatric Consultation Scale (PCAT) over a one-week period for

evaluating a dental student consultation with a child-patient and their parent.

- b) To assess the correlation between parental opinions concerning the quality of the consultation using a combination of the dentist-patient interaction tool and students' rating using the PCAT scale.

2.0 Materials and Methods:

Undergraduate dental students were paired, one was the peer observers and the other was the consulting dentist. The consulting dentists conducted a first clinical visit appointment for the child and parent; the peer observers observed the consultation and recorded observations using a Paediatric Consultation Assessment Tool (PCAT). Following the completion of the consultation, the consulting dentist was asked to complete the PCAT scale to critique their own performance throughout the consultation. Furthermore, the parents were asked for their opinions of the consultation using the dentist-patient interaction tool. Finally, the consultation was videotaped by the researcher. One week later, the same pair of peer observers and consulting dentists reviewed the videotape with the researcher. They completed a further PCAT scale, as well as a qualitative questionnaire, with the objective to explore their feelings in terms of which method they preferred, video-tape review or peer review. A chart summarising the methodology of the study is shown in Figure 2.1.

Figure 2.1 Summary of the study methodology.

| | What happens | Undergraduate dental students | Parent |
|---------------------|---|---|---|
| Before consultation | information | Consulting dentist Observer -invitation and information sheet sent via email. -training session on how to use PCAT scale | Parent Invitation and information sheet sent with appointment letter |
| | consent | During training session | At beginning of consultation |
| During consultation | Consultation (will be videotaped) Outcome measure | PCAT _{dent1} | PCAT _{obs1} Parent satisfaction questionnaire. |
| After consultation | Videotape review by the same consulting dentist and observer Outcome measure | -PCAT _{dent2} -Qualitative questionnaire -Feed back to undergraduate dental students | -PCAT _{obs2} -Qualitative questionnaire N/A |

2.1 Ethical approval

The following research approvals were undertaken prior to the commencement of the study. This included:

- Ethical approval was obtained from National Research Ethics Service (NRES) committee of Leeds east (REC reference number: 12/yh/0261, Appendix1).
- Leeds Research and Development Directorate (R&D) approval was obtained from Leeds Teaching Hospitals (LTHT R&D number DT 12/10330, Appendix 2).
- Educational ethical approval obtained from University of Leeds Educational Research Ethics Committee (EDREC) (reference number: EDREC/11/042, Appendix 3).

The Educational Research Ethics Committee advised several modifications to the protocol necessitating further amendments from NRES and R&D. The amendments were approved by NRES and R&D (Appendices 4 and 5).

2.2 Undergraduate Tutorial Stage

The study took place through a three stages approach. The first stage was incorporated into the undergraduate Paediatric Dentistry training. The training consisted of two sessions with 3 hours available for each session. The two sessions covered various aspects related to paediatric dentistry.

The second session took only two hours of the available three hours. Therefore, it was decided to use the extra hour to explain the nature of the study and the

tools to be used in the study and this part of the session was called the PCAT scale tutorial.

The PCAT scale tutorial started with a short presentation emphasising the importance of good communication during a consultation, followed by the essential set of communication tasks during an initial consultation, as stated in the Kalamazoo consensus statement (Makoul, 2001a). The undergraduate students were familiarised with the main categories of the PCAT scale (Figure, 2.3) and the individual criteria within each category. The descriptors in the marking key were discussed, and what constitutes good communication skills and why, were examined. The undergraduate students were then given the opportunity to watch two videos. The videos were recorded using two adult actors and one child actor (as a dentist, parent, and child patient). The scenarios for the videos were developed by the researcher (MA), and were cross checked by two senior staff members. The videos portrayed an example of good and a less good initial appointments. The undergraduate students were given the opportunity to score the quality of the consultation critiquing either individually or in groups of 3-4 students.

2.3 Selection of participants

2.3.1 The principle inclusion criteria

- Undergraduate dental students who commenced their clinical Paediatric Dentistry teaching in April 2012 were eligible.
- Children, age 5-11 years old were eligible for inclusion if they had an initial appointment with one of the undergraduate students who commenced the clinical Paediatric Dentistry teaching in April 2012.

2.3.2 The principal exclusion criteria

- Undergraduate dental students at Leeds Dental Institute who did not commence the training in clinical Paediatric Dentistry in April 2012.
- Parent/legal guardian and/or child patients who did not speak English sufficiently or required an interpreter at the initial consultation.
- Parent/child patient with special communication needs.
- Children with a child protection plan.

2.4 Recruitment of participants and obtaining consents

Recruitment and the consent process involved both undergraduate dental students and children and their parents or legal guardians. The processes involved for each group will be described separately.

2.4.1 Undergraduate students

Undergraduate dental students at Leeds Dental Institute, who commenced their clinical Paediatric Dentistry teaching in April 2012, were invited to take part in this study.

Undergraduate students were sent an invitation, via email, two weeks prior to the start of the study. The email contained the student's participant information sheet (Appendix, 6). This was followed by small tutorial to explain the study and the relevant tools used in the study (which will be discussed in further detail in section 2.4). This tutorial was incorporated into their clinical introduction to Paediatric Dentistry teaching.

Undergraduate students, who had a new patient appointment booked, were approached individually by the researcher (MA) at the beginning of the clinical session to assess their willingness to participate in the study. They were given time to re-read the information sheet and ask questions about the study. Once they agreed to participate they were asked to sign the consent form (Appendix, 7).

A second undergraduate student was recruited to act as a peer observer. This student was chosen from a group of students, who did not have an appointment with a child patient or their patient had failed to attend. This second student was paired with the student who did have a new patient appointment and provided clinical nursing support during the appointment, as well as acting as a peer observer.

2.4.2 Recruitment of parent and child

Children aged between 5-11 years old and their parents, who had an initial appointment booked in the undergraduate clinic, were sent a parent and child invitation letter in the mail with their appointment letters (Appendices 8 and 9).

On arrival at their appointment, the child and parent were approached by the researcher (MA) and asked if they would like to participate in the study. The parents and older children (aged 9-11 years) had time to re-read the information sheet and were given the opportunity to ask questions before signing the consent or assent form (Appendix, 10 , and 11).

For younger children, 5-8 years old, a story board was developed to explain the study using developmentally appropriate material (Appendix, 12). A children assent was assessed by asking them to explain the nature of what was proposed and to express their willingness or refusal to participate. No assent forms were signed for this age group.

2.5 Live sessions (Peer Review):

At each new patient consultant session, the following people were involved in the research:

- Consulting dentist: who was an undergraduate student with a child patient. The consulting dentist carried out the initial appointment for the child and parent. This included history taking, examination, radiographs where necessary, treatment planning, and prevention advice. Following the consultation, the consulting dentist was asked to complete the PCAT SCALE (Figure, 2.3) to critique their performance during the consultation.
- Peer Observer: who was an undergraduate student who assisted with the appointment. The peer observer acted as assistant, as well as observer by recording their critique of the consulting dentist using a PCAT scale. The researcher (MA) asked the students to discuss their critique together without interference from the researcher or the clinical supervisor.
- Parents were asked for their opinions and overall satisfaction regarding the consultation using the dentist-patient interaction tool (Figure, 2.4).
- The consultation was recorded on videotape by the researcher (MA) using a Sony HDV 1080i (Appendix 16 describes the specific features of the camera). The video camera was cited on the clinic in a position to allow maximum coverage of the clinical scene and ensure sound could

be heard. After setting up the video camera, the researcher (MA) left the clinical area to allow for a normal clinical consultation to develop. Figure 2.2 shows the video camera setting in the clinic.

Figure 2.2 The camera setting in the clinical area during the live session



Figure 2.3: The Paediatric Consultation Assessment Tool.

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Date:

THE PCAT SCALE (HOWELLS *ET AL.*, 2010)

V1(8/5/2012)

On this page, details of the consultation, the clinician and yourself are given. The clinician's communication skills will be scored based on the descriptors provided.

Fill in the boxes for each individual skill and then use these judgments to guide your overall score for each section.

Where indicated and whenever the patient is able to contribute to the conversation, evaluate the skills used with child and parents separately.

Consultation:

| | |
|-------------------------------|--|
| Age of the child/young person | |
| Length of the consultation | |
| Other people present | |

Dentist/Observer (please circle one)

| | | |
|--------------|---------|----------|
| Students ID | | |
| Student role | Dentist | Observer |

Content Skills:

1 = very poor, 7 = very good

Comments:

| | | |
|---------------------------------------|---------|--|
| Gather relevant essential information | | |
| Undertake patient examination | 1 3 5 7 | |
| Generate appropriate diagnosis | 1 3 5 7 | |
| Formulate relevant management plan | 1 3 5 7 | |

Figure 2.3 continued.

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Comments:

| Gathering information | 1 | 3 | 5 | 7 |
|---|---|--|--|---|
| Listens attentively, facilitating verbally and non-verbally | Interrupts all the time or invalidates family's story or excessive use of roles <input type="checkbox"/> | Interrupts moderately often or poor facilitation or a little too much use of notes <input type="checkbox"/> | Moderate facilitation with occasional interruption <input type="checkbox"/> | Shows interest by verbal and non-verbal facilitation good use of silence <input type="checkbox"/> |
| Picks up and responds to verbal and non-verbal cues | No response to obvious verbal, non-verbal cues or is rude in response <input type="checkbox"/> | Minimal response to verbal / non-verbal cues (despite being present) <input type="checkbox"/> | Picks up and responds to cues but occasionally misses cues <input type="checkbox"/> | Repeatedly picks up verbal and non-verbal cues, with sensitive response <input type="checkbox"/> |
| Uses appropriate questioning techniques (e.g. open-closed questions) | Obstructs patient narrative, exclusive use of closed questions <input type="checkbox"/> | Too little space for narrative or too many closed too early <input type="checkbox"/> | Appropriate questioning, a few too many closed questions <input type="checkbox"/> | Natural sequence of questions, sensitive questioning style for all family members <input type="checkbox"/> |
| Explores parent/child's ideas concerns, feelings, expectation | Does not explore parent/child's perspective at all obstructs discussion <input type="checkbox"/> | Limited or awkward discussion of parent/child's perspective <input type="checkbox"/> | Moderate amount of exploration of parent/child's perspective <input type="checkbox"/> | Sensitively explores and values parent/child's perspective <input type="checkbox"/> |

Overall rating:

Gathering information (parent): 1 3 5 7

Gathering information (child): 1 3 5 7

Comments:

| Physical examination | 1 | 3 | 5 | 7 |
|---|---|--|---|---|
| Prepares for examination e.g. by attending to privacy, toys: | Does not prepare for examination at all <input type="checkbox"/> | Minimal preparation for examination <input type="checkbox"/> | Some preparation for examination <input type="checkbox"/> | Carefully attends to accessories, seating, others in room, etc. <input type="checkbox"/> |
| Maintains rapport with the child through the examination | No rapport: is rude or abrupt, or ignores child <input type="checkbox"/> | Some effort to develop rapport but still awkward <input type="checkbox"/> | Good rapport but occasional inappropriate behaviour <input type="checkbox"/> | Sensitively maintains rapport throughout examination process <input type="checkbox"/> |

Physical examination: 1 3 5 7

Comments:

Figure 2.3 continued.

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Process Skills

| Building the relationship | 1 | 3 | 5 | 7 |
|---|--|--|--|--|
| Non-verbal skills: eye contact, open posture, avoids writing / reading notes | Minimal eye contact, obstructive posture, excessive reading, or writing notes with no explanation <input type="checkbox"/> | Minimal eye contact, awkward posture, refers to / writes in notes with no explanation <input type="checkbox"/> | Quite good eye contact and posture, occasionally inappropriate non-verbal behaviour <input type="checkbox"/> | Very good non-verbal skills. explains need to use notes <input type="checkbox"/> |
| Is empathetic and supportive – shows concern, responds to family predicament | Ignores patients predicament completely; totally unsupportive + rude <input type="checkbox"/> | Minimal response to parent/child's predicament, limited support <input type="checkbox"/> | Warmth towards family but occasionally poor response to predicament <input type="checkbox"/> | Much warmth and natural empathy throughout consultation <input type="checkbox"/> |
| Appropriately engages child from the early stages of consultation | Completely ignores child <input type="checkbox"/> | Almost completely ignores child or is awkward / inappropriate <input type="checkbox"/> | Engages child but occasionally inappropriate insensitive or overpowering <input type="checkbox"/> | Sensitively tries to engage child, adjusting approach to child's response <input type="checkbox"/> |

Overall rating:

Building the relationship (parents): 1 3 5 7

Building the relationship (child): 1 3 5 7

Comments:

| Initiating the session | 1 | 3 | 5 | 7 |
|--|--|---|---|---|
| Introduces self, clarifies role, determines who is present | Does not establish who is present <input type="checkbox"/> | Minimal information clarified <input type="checkbox"/> | Most but not all is clarified e.g. self and role, but not family members <input type="checkbox"/> | Explains role and identity, sensitively determines who is present <input type="checkbox"/> |
| Identifies reasons for the consultation – the doctor's and family's | Neither explains purpose for consultation nor checks family's reasons <input type="checkbox"/> | Limited coverage of own or family's reasons for consultation <input type="checkbox"/> | Explains own reasons for consultation: responds poorly to family's reasons <input type="checkbox"/> | Explains own reasons for consultations and acknowledges those of family <input type="checkbox"/> |
| Screens for other problems and negotiates the agenda for the consultation | No check for other problems and no agenda identified <input type="checkbox"/> | Screens for but ignores other problems <input type="checkbox"/> | Screens but no agenda set/only doctor's needs are discussed <input type="checkbox"/> | Screens for and responds to other problems, contracts a clear agenda with family <input type="checkbox"/> |

Overall rating:

Initiating the session (parent): 1 3 5 7

Initiating the session (child): 1 3 5 7

Figure 2.3 continued.

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| Explanation and Planning | 1 | 3 | 5 | 7 |
|---|---|--|--|---|
| Tailors amount and type of information for parent's and child | No attempt at all to adjust information to parent child's needs <input type="checkbox"/> | Determines but does not respond to starting point little checking. <input type="checkbox"/> | Some tailoring of info but could still be better <input type="checkbox"/> | Checks starting point, tailors information well <input type="checkbox"/> |
| Uses skills which aid recall and understanding | Muddled information, lots of jargon, no checking for understanding <input type="checkbox"/> | Disorganized information, a little jargon, limited or no checking for understanding <input type="checkbox"/> | Organized information, a little jargon, some checking for understanding <input type="checkbox"/> | Well-organized jargon-free info, repeated checks for understanding, asks for restate <input type="checkbox"/> |
| Incorporates parent/child's perspective into explanation | Completely ignores or belittles perspective <input type="checkbox"/> | Limited incorporation of parent/child's perspective into explanation <input type="checkbox"/> | Some incorporation of parent/child's perspective into explanation <input type="checkbox"/> | Very good incorporation of parent/child's perspective into explanation. <input type="checkbox"/> |
| Involves parent/s and child in decision making | Prescriptive management plan, no consideration of family's wishes <input type="checkbox"/> | Describes options but still offers little choice to parent/child <input type="checkbox"/> | Some involvement of parent/child's perspective into explanation <input type="checkbox"/> | Parent/child fully participant in decision making <input type="checkbox"/> |

Overall rating:

Explanation and planning (parent): 1 3 5 7

Explanation and planning (child): 1 3 5 7

Comments:

| Closure | 1 | 3 | 5 | 7 |
|---|--|--|--|---|
| Establishes and clarifies next steps with parents and child | Does not establish or clarify next steps at all <input type="checkbox"/> | Some plans and next steps made, but no cross-checking with family <input type="checkbox"/> | Clear plans made and next steps but not fully cross-checked with family <input type="checkbox"/> | Carefully explains of plan and next steps, cross-checks with family if acceptable and understood <input type="checkbox"/> |
| Makes contingency plans | No contingency plans or disparages requests for contingencies <input type="checkbox"/> | Limited or transparently impractical contingency plans <input type="checkbox"/> | Contingency plans made but not clarified with family <input type="checkbox"/> | Clear contingency plans clarified with family <input type="checkbox"/> |

Overall rating:

Closure (parents): 1 3 5 7

Closure (child): 1 3 5 7

Comments:

Figure 2.3 continued.

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| Structuring | 1 | 3 | 5 | 7 |
|--|--|--|---|--|
| Uses skills which provides structure (e.g. summarizing and sign posting) | Neither of skills used at all, despite opportunity OR chaotic consultation without being patient-centred | Minimal use of summarizing and sign posting, despite opportunity | Some use of summarizing and sign posting, could have beneficially used more | Very good (abundant and appropriate) use of summarizing and sign posting |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Overall rating:

Structuring the interview: 1 3 5 7

Comments:

Overall performance (parent): 1 3 5 7

Overall performance (child): 1 3 5 7

Figure 2.4: The parent-dentist interaction tool (parent satisfaction questionnaire)

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PARENT'S QUESTIONNAIRE (CROSSLEY *ET AL.*, 2005)

VI (8/5/2012)

Please tick the box that best reflects your opinion.

| | The best I can imagine (5) | Better than most (4) | Same as most doctors (3). | Worse than most (2). | The worst I can imagine (1). |
|---|-------------------------------------|-------------------------------|------------------------------------|----------------------------|------------------------------------|
| How much opportunity were you given to discuss or do the things you wanted? | | | | | |
| How happy are you to follow the dentist's suggestions and treatments? | | | | | |
| How well do you think you understand your child's condition(s) now? | | | | | |
| How well do you understand your child's treatment(s) now? | | | | | |
| How confident do you feel in looking after your child's condition(s) now? | | | | | |
| How good with parents is this dentist? | | | | | |

Figure 2.4 continued.

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| | The best I can imagine (5) | Better than most (4) | Same as most doctors (3). | Worse than most (2). | The worst I can imagine (1). |
|---|-------------------------------------|-------------------------------|------------------------------------|----------------------------|------------------------------------|
| How good with children is this dentist? | | | | | |
| How much was the dentist interested in your point of view when he/she was asking questions? | | | | | |
| How much was the dentist interested in your point of view when he/she was planning and explaining things? | | | | | |
| How much was the dentist interested in your child's point of view when he/she was asking questions? | | | | | |
| How much was the dentist interested in your child's point of view when he/she was planning and explaining things? | | | | | |
| How well do you feel the dentist listened to you? | | | | | |
| How well do you think the dentist understood you? | | | | | |
| How well did the dentist explain things? | | | | | |
| Overall, how satisfied are you with the dentist in this consultation? | | | | | |

Thank you.

2.6 Videotape Review Session:

After one week, the same peer observer and consulting dentist reviewed the videotape of the same consultation with the researcher (MA) in a private setting. The videotapes were edited to remove any unnecessary footage such as, going to the radiography department, waiting for clinical supervisors or prevention instruction given to the patient and parent. The editing was done to decrease the length of the video so that it would be reasonable and relevant. The editing was carried out by the researcher (MA) using Windows 8 moviemaker¹.

After watching the video, the consulting dentist and peer observer independently completed a further PCAT scale to critique the consulting dentist performance based on watching the video. Furthermore, the peer observer and the consulting dentist completed a qualitative questionnaire (Figure, 2.5). This questionnaire aimed to explore the preferences of the students for —videotape or peer reviews— as a method to evaluate their communication skills.

Having completed the questionnaires, the consulting dentist and peer observer were given time to discuss their thoughts on the patient visit. The researcher (MA) ended the session by offering her supportive critique to the undergraduate students.

¹ Free video editing software by Microsoft. It is part of windows essential software suite.

Figure 2.5: Qualitative questionnaire.

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QUALITATIVE QUESTIONNAIRE FOR STUDENTS V2

11/9/2012

Date:

Are you the dentist or observer?

1) If there was only one option of feedback on your consultation – the student observer or a video tape review which would you prefer and why?

2) Did you benefit from reviewing the consultation on video?

Yes No

How?

3) Did you identify different communication issues between consultation and video review?

Yes No

What?

Figure 2.5 continued.

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4) Did the video review help you to develop your communication skills?

Yes No

How?

5) Did the PCAT help you to structure your evaluation of the consultation?

Yes No

How?

6) Did the observer help you to assess the consultation? (Please only answer this question if you are the dentist)

Yes No

How?

7) For the observing dentist, would you want to have one of your consultations recorded?

Yes No

Thank you for your cooperation.

2.7 Equipment used in the study.

Sony HDV 1080i video camera and ECMNV1 microphone were used in this study (Figure 2.3). The camera was stabilised on a Sony VCT1170 RM tripod. To allow for better coverage of the clinical area, a wide lens VCL- HG0737x was used.

The Sony camera HDV 1080i had the following features:

- 1,080 effective scanning lines (interlace scanning system) and 1,440 horizontal pixels.
- A MPEG-2 compression format (MP@H-14 for video), which used 8-bit digital component recording with a sampling rate of 4:2:0.
- MPEG-1 Audio Layer II was used as the audio compression format, allowing for two-channel recording with a sampling frequency of 48 kHz/16-bit.
- Each consultation was recorded into a mini cassette tape (the digital master PHDVM-63DM). This tape allowed HDV, DVCAM, and DV format. A maximum consultation of 63 minutes was available for each tape.

For more information about the video camera please look at Appendix, 13.

Figure 2.6 The camera equipment used in this study.



2.8 Data analysis:

2.8.1 Qualitative analysis:

The written answers from the questionnaire were transferred to a word document where the answers to each question were gathered in a separate table for ease of reading and visualisation. The framework analysis was used to analyse the data (Ritchie and Lewis, 2003). The framework analysis consisted of three main steps; these were “data management”, “descriptive accounts”, and “explanatory accounts”.

1) Data management:

The process of data management started with familiarising the author with the data. This was done during the transfer of the data to a word document. After the familiarisation process, recurrent ideas or themes were identified and organised in an index (conceptual framework). The recurrent themes were then grouped under higher order main themes. The index developed was used to label the raw data with the aim to show which theme or concept was being mentioned in the raw data. Data with similar concepts or themes were grouped together to allow focus on each subject. The data were then synthesised to reduce the data into a manageable level.

2) Descriptive accounts:

Initial themes were refined and associations between them identified.

3) Explanatory accounts:

The findings were interpreted and explained. During the explanation, the author reflected on the original data to assure accurate reflection of the students' opinion.

2.8.2 Quantitative analysis:

At the end of the study, the PCAT scores were collected and compiled into excel sheets. Statistical analysis was carried out using SPSS statistical package for windows version 19 (SPSS Inc. Illinois).

The following statistical methods were carried out:

- Descriptive accounts: descriptive statistics such as means, standard deviations and box and whiskers plots were computed using SPSS.
- Inter- and intra -raters agreements were tested using Cohen's Kappa. The Kappa value was interpreted as follow (Viera and Garrett, 2005):
 - < 0 =less than chance agreement (proportion of agreement by chance exceeds proportion of agreement obtained).
 - 0.01-0.20= slight agreement
 - 0.21-0.4= fair agreement
 - 0.41-0.60= moderate agreement
 - 0.61-0.80= substantial agreement
 - 0.81-0.99= almost perfect agreement
 - 1= perfect agreement.
- Correlation between the global parent satisfaction questionnaire and the PCAT global scores was tested using Spearman's correlation coefficient (r). The Spearman's correlation coefficient (r) was interpreted as follow:
 - 0.16-0.29= weak to low correlation.
 - 0.3-0.4.9= moderate to low correlation.
 - 0.5-0.69= moderate correlation.
 - 0.7-0.89= strong correlation.
 - 0.90= very strong correlation

A negative value indicated negative relationship (as one variable goes up the other goes down) and positive values indicated a positive relationship. A p value (two tailed significance) of less than 0.05 indicated that a true correlation existed, whereas, a p value of more than 0.05

implied that the correlation was most likely due to chance rather than true correlation.

Statistical advice was sought from J.Kang who is a statistician at the University of Leeds. Power calculation for the study was not possible as the literature does not contain similar studies.

2.9 Data management

In undertaking the research, the researcher (MA) was privy to confidential and potentially sensitive clinical and research-based participant information. All research data were kept securely by the researcher (MA) in password-protected computer files. All paper based information data detailing students' names and hospital record numbers were stored in a locked cabinet in a locked office on the sixth floor at Leeds Dental Institute (LDI). Furthermore, all paper based information data containing students' names and hospital record numbers were transferred to password protected computer files with unique student and patient numbers. The computer files were kept on the main servers at the University of Leeds. All videotape footage was stored on the University servers of the Medical and Dental Illustration Department at LDI. This video footage was stored following the same protocol as for all other clinical photographs and video materials taken by the Medical and Dental Illustration Department at Leeds Dental Institute.

Data will be retained for two years after the submission of the thesis publication.

3.0 Results

3.1 Participants

Forty-two fourth year undergraduate students participated in the study. The undergraduate students were paired together to form 21 pairs. Each pair consisted of a consulting dentist and a peer observer who undertook a first clinical consultation for a child and their parent. Each of the 21 consultations were recorded on video. Three pairs were excluded for the following reasons:

- Technical difficulty: the video failed to record sound.
- The age of the child was older than the age specified in the inclusion criteria.
- Failure of both undergraduate students to attend the video review session.

Therefore this study consisted of 18 pairs. There was an equal distribution of genders between the consulting dentist, with nine female undergraduate students and nine male undergraduate students. There was a slightly higher number of male peer observers (10) compared to female peer observers (8). Twenty-one children and their parents participated in the study. Three of the children and their parents were excluded from the study owing to reasons described above for the undergraduate student pairs. The age of the children ranged from 5-11 years old, with the mean age of the children at 7.2 years old and a standard deviation of 2.2. Eleven female and seven male children were seen. The individual characteristics of each child are detailed in table 3.1.

Table 3.1 Demographic data of included undergraduate student pairs and child patients seen and recorded during a first clinical live session in paediatric dentistry.

| Group number | Consulting dentist gender | Peer observer gender | Patients age (mean=7 years, SD=2.2) | Patients gender |
|--------------|---------------------------|----------------------|--|-----------------|
| G1 | F | F | 7 | F |
| G2 | M | F | 8 | F |
| G3 | M | F | 5 | M |
| G4 | M | M | 10 | M |
| G5 | F | F | 5 | F |
| G6 | M | F | 7 | M |
| G7 | F | F | 5 | M |
| G8 | M | F | 9 | F |
| G9 | F | F | 6 | F |
| G10 | M | M | 11 | M |
| G11 | M | M | 6 | M |
| G12 | F | M | 10 | F |
| G13 | M | M | 9 | F |
| G14 | F | M | 5 | F |
| G15 | F | M | 10 | M |
| G16 | M | M | 6 | F |
| G17 | F | M | 5 | F |
| G18 | F | M | 5 | F |

3.2 Quantitative data from the qualitative questionnaire:

Thirty-six questionnaires were completed by the fourth year undergraduate dental students at the University of Leeds. The questionnaire consisted of seven questions. The first question was an open ended question, questions two to six were a combination of open and closed ended questions, and question

seven was a closed ended question. For the closed questions, the answers were YES or NO answers. The results of the questions are shown in Table 3.2. The open questions were analysed using a qualitative approach (section 3.3)

Table 3.2 The distribution of undergraduate students' answers to the qualitative questionnaire

| Question number | Yes | No |
|---|----------------------------------|----|
| Q1 (if there was only one option of feedback on your consultation- the student observer or video tape review which would you prefer and why?) | All preferred video | |
| Q2 (did you benefit from the consultation on video? How?) | All benefited | |
| Q3 (Did you identify different communication issues between consultation and video review? What?) | 27 | 9 |
| Q4 (Did the video review help you to develop your communication skills? How?) | 34 | 2 |
| Q5 (Did the PCAT help you to structure your evaluation of the consultation? How?) | 35 | 1 |
| Q6 (Did the observer help you to assess the consultation? How? (This question only for the consulting dentist)) | 17 | 1 |
| Q7 (Would you want to have one of your consultations recorded? (This question only for the peer observer)) | All wanted a video consultation. | |

All 36 (100%) students agreed they preferred the video tape review to the peer review. For the second question, all students reported that they benefited from the video tape review. Although, 34 (94%) undergraduate students answered, YES to question four, the video review session helped them to develop their communication skills with two peer observers answering NO. Nine (25%) undergraduate students answered NO, to question three; they could not identify different communication issues between the live session and the video review

session. Of these nine undergraduate students six were peer observers (67%) (Table 3.2).

All students except one (97%) answered YES, to question five; the PCAT helped them structure their evaluation of the consultation with one peer observer answering NO.

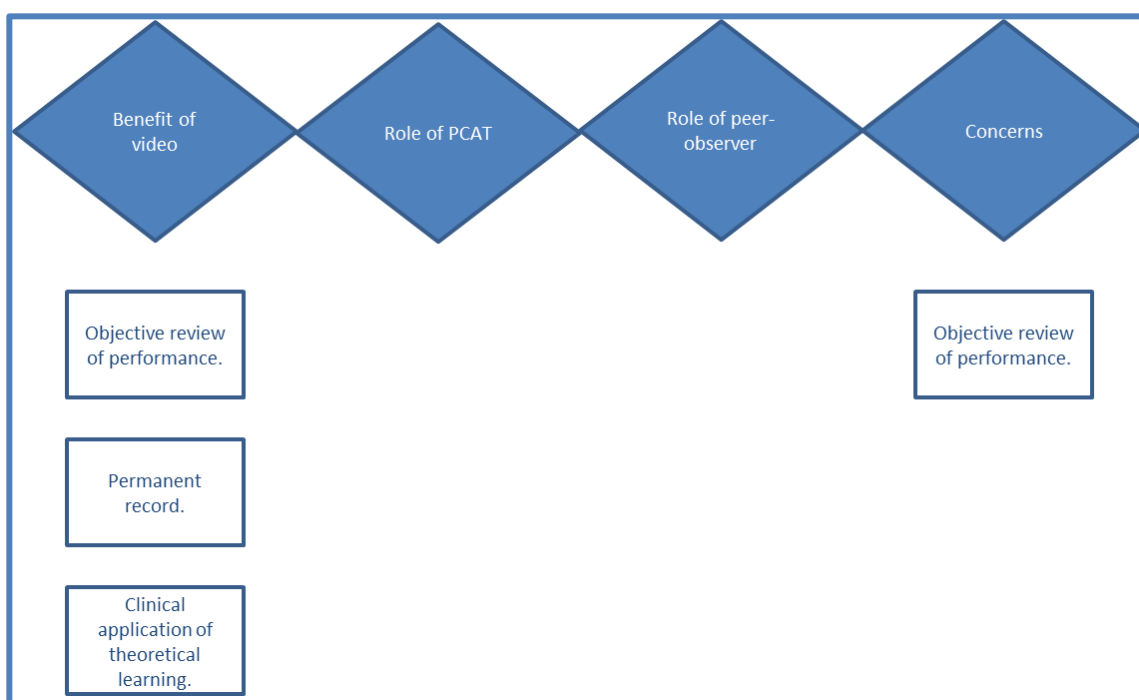
The final question was split to form two questions (question six and seven), and the different parts were answered by either the consulting dentist or the peer observer. All the consulting dentists except one (97%) reported that they benefited from the peer observers presence to assess their communication skills.

All the peer observers (100%) answered YES they would like one of their consultations recorded. Even though this was a closed question, some peer observers provided descriptive commentary which is included in the qualitative analysis in section 3.3.

3.3 Qualitative data:

Using the analytical hierarchy (Ritchie and Lewis, 2003) the qualitative answers were analysed and a number of themes emerged. The themes were “benefit of video, role of the PCAT”, “role of the peer observer”, and “concerns” (Figure 3.19).

Figure 3.1 Themes developed for the qualitative questionnaire.



Full thematic chart table is available in the CD included with this study.

3.3.1 Benefit of video review:

Students valued the video recording of the consultations and identified a number of benefits that the video review session offered over the live session. A number of subthemes emerged within the benefit of the video review theme. These were “objective review of performance”, “permanent records”, and “clinical application of theoretical learning”.

3.3.1.1 Objective review of performance:

The video review offered the students an objective review of the consulting dentists' performance. The clinical environment is often distracting to the peer observer and the consulting dentist which limits a comprehensive critique of the consultation. The peer observer can be distracted by the loud noises in the clinic for example, an uncooperative child or the discussions between the clinical supervisor and students in adjacent clinics. Furthermore, the peer observer may need to leave the clinical area to bring materials from the dispensary room or stop their evaluation if their patient attends for their own appointment. The consulting dentist completed the PCAT of their performance after the consultation; this may compromise their ability to remember salient points. Reviewing the video in a private and quiet environment allowed a better examination of the consultation and enabled complete concentration on the student performance. Examples of this were:

"Observer cannot always see all aspects of the consultation in the clinic as they are busy assisting. Also, the most harsh critic is usually yourself so it is nice to see yourself and be able to assess yourself when away from the clinic"
consulting dentist participant 33.

"Definitely. After the consultation, I thought it had gone reasonably well. Only after watching the video did I realise there was a lot of room for improvement. Watching the video in relaxed environment allowed for better observation"
consulting dentist participant 9.

During the video review different communication issues were identified. One of the communication issues identified on the video review was the non-verbal communication of the child, dentist and the parent, which can be easily missed during the live session. The students were able to watch how the different events and the body language of the consulting dentist affected the body

language of the parents, and the effect it had on the behaviour of child and parent. An example of this was:

“Videotape review allows for better concentration on what everyone did parents and child body language. When in the clinic the concentration is on the task at hand” peer observer participant 6.

The video review allowed the consulting dentist to reflect on their performance. This helped students to highlight habits that they were not previously aware of for example, awkwardness due to excessive writing in the notes, long silences , nervous laughs, and excessive hand movements. An example of this was

“Although it seems daunting at first, it is the only way you can analyse everything you do. You don’t often get to view your action back, so I felt this gave a really good insight. The observer may miss things because they are looking at the consultation from their own prospective” consulting dentist participant 17.

“Never been able to watch myself back before. It is interesting to listen to how I word things. It gave me an insight into my behaviour” consulting dentist participant 17

The video review highlighted good as well as bad habits. It helped some students improve their confidence. An example of this was:

“I felt I did less well right after the consultation. On watching the video I had more accurate view of my performance “ consulting dentist participant 33

The video review served as a better way to receive critique because the consulting dentist was able to see what they did rather than just hear it. This decreased the chances of denial. Also, it served as a strong reminder of the good habits they can repeat and the bad habits that they can avoid. An example of this was:

“You can see nonverbal as well as verbal interaction and pick up any errors. Also, it is more embarrassing seeing yourself doing something wrong than

being told you have done it wrong, so it sticks in your mind and help remind you not to do it again “consulting dentist participant 21

3.3.1.2 Permanent record:

Capturing the consultation on video tape meant that these were available for the students to review whenever they wanted to. The consulting dentist could review the videotaped consultation on their own without depending on the availability of a peer observer. Furthermore, if the consulting dentist was recorded on video several times, they could see their progression. Examples of this were:

“It is much easier to go back to the video and look at it rather than counting on the observer “consulting dentist participant 31.

“I think it would benefit me greatly. Also, I think a number of records over time would allow progression to be assessed” peer observer participant 34.

3.3.1.3 Clinical application of theoretical learning:

The students at the Leeds Dental Institute receive communication skills training throughout their curriculum. The majority of the training is concentrated on adult patients using standardised patients. The video tape review allowed the students to apply what they learnt in paediatric dentistry lectures and seminars to real life situations. An example of this was:

“Reinforced some teaching that has only been shown in lectures, allowing greater understanding of application “peer observer participant 12.

3.3.2 Role of the PCAT:

The PCAT assessment frame work provided the undergraduate students with clear steps in how to evaluate the consultation. The PCAT helped students structure the critique and as a result ensured all aspects of the consultation were covered.

The students had a conflicting opinion regarding the ease they found with using the PCAT. On one hand, students described it as an easy scale to use. It provided key areas and descriptors to help provide cues to focus their analysis. It also helped them to understand the correct structure for a consultation. An example of this was:

“PCAT breaks it up into smaller parts, which gets you to assess fine details that you may not have thought about” consulting dentist participant 21.

On the other hand, students felt even though the PCAT was helpful, it was lengthy, and the descriptors did not relate to the consultation, which was confusing for them. Furthermore, they felt confused on how to score the consultation separately for the parent and the child but simultaneously. Examples of this were:

“Splits the consultations down into sections. However, confusing some times as whether I was measuring it based on parent or child” consulting dentist participant 17

“In some way but the length and arrangement of the boxes sometimes did not relate to the consultation” consulting dentist participant 5.

3.3.3 Role of the peer observer:

The consulting dentists felt that the peer observer helped them to assess the consultation, as they provided a different point of view. An example of this was,

“I think it is really beneficial to discuss the consultation and listen to other people’s ideas that you may not have thought of yourself. See the consultation through your eye” consulting dentist participant 10

However, reservations were voiced as to whether the peer observer can provide valuable criticism. An example of this was:

“No because the peer observer is at the same level as I am and I am not sure how much he can offer” consulting dentist participant 19.

3.3.4 Concerns

3.3.4.1 Effect on the quality of the consultation:

The presence of the camera in the clinical area is a foreign concept to the undergraduate dental students. Being videotaped during a real consultation with real patients can possibly increase their anxiety. Therefore the quality of the consultation may be affected. Students suggested having a more subtle camera and possibly waiting until they had gained more experience before it was used.

Example of this was:

“Only once I have gained some initial experience with child consultations as I am nervous as is.” Peer observer participant 18.

3.4 Quantitative results:

3.4.1 PCAT scores distribution:

3.4.1.1 Summary to compare the scores given by the consulting dentist and the peer observer.

The peer observers' scores for the consultation were constantly high (5-7) during the live session (Figures 3.2-3.15).

The peer observers' scores for the consultation remained the same (5-7) during both the live session and the video review session, for initiating the session with the child, building the relationship with the child and the parent, structuring the consultation, closure with the parent, gathering information from the parent and the child, and explanation and planning for both the child and the parent. However, the scores were lowered from the live session to the video review session for global score for the child and the parent, initiating the session for the child, and closure for the child. These lower scores were centred on five, which is labelled as a "good score".

The consulting dentists' score were generally lower for the consultation during both the video review session and the live session compared to the peer observer. Some scores remained constantly good (around 5), these included: global score child, initiating the session for the parent, building the relationship with the parent, and structuring the consultation. Other scores remained constantly lower (5-3) in both sessions, these were gathering information from child, and explanation and planning.

The consulting dentist scores for the consultation was lower during the video review session compared to the live session for the following; global score for the parent, initiating the session for the child, building the relationship with the child, examination, closure with both the parent and the child, and gathering the information from parents. However, the consulting dentist scored themselves higher for explanation and planning for the parents during the video review session compared to the live session. Summary of the distribution of the data is shown in figure 3.18.

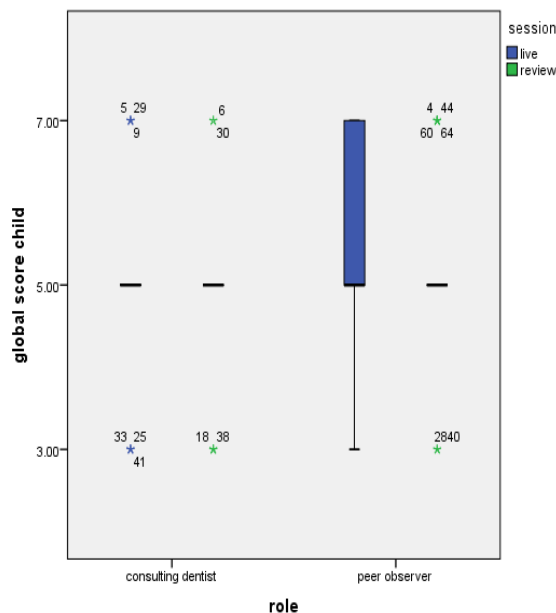


Figure 3.2 Shows a box and whiskers plot for the PCAT global score for the dentist communication with the child at the consultation (live session) and one week later (review session).

The consulting dentists' scores for their performance remained similar between the two sessions and concentrated around five with few outliers.

The peer observer scores in the observation session were higher than in the video review session with the majority of the scores in the observation session between five and seven and the whisker going as low as three. In the video review session the scores were lowered to be concentrated on five with few outlier.

The length of the box represents the spread between the 25th and the 75th interquartile ranges. The bold line is the median and the whiskers are extended to the largest or smallest score or 1 ½ length of the box whichever is smaller. The stars represent data points laying greater than three times the length of the box.

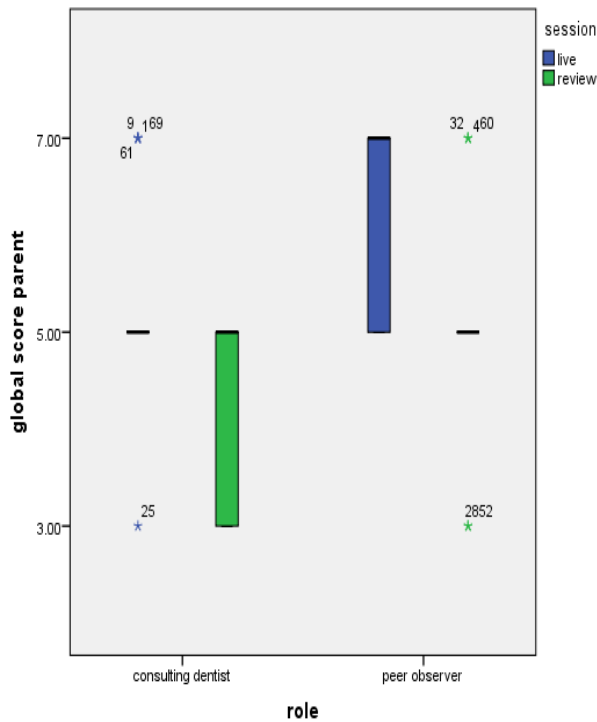


Figure 3.3 Shows a box and whiskers plot for the PCAT global score for the dentist communication with the parent at the consultation (live session) and one week later (review session).

The consulting dentist scores for their performance in the observation session were concentrated around five with few outliers. The consulting dentist scores for their performance decreased in the video review session, with majority of the scores between three and five. Majority of the peer observer scores for the consulting dentist performance were between five and seven in the observation session. The peer observers' scores decreased in the video review session to be concentrated around five with few outliers.

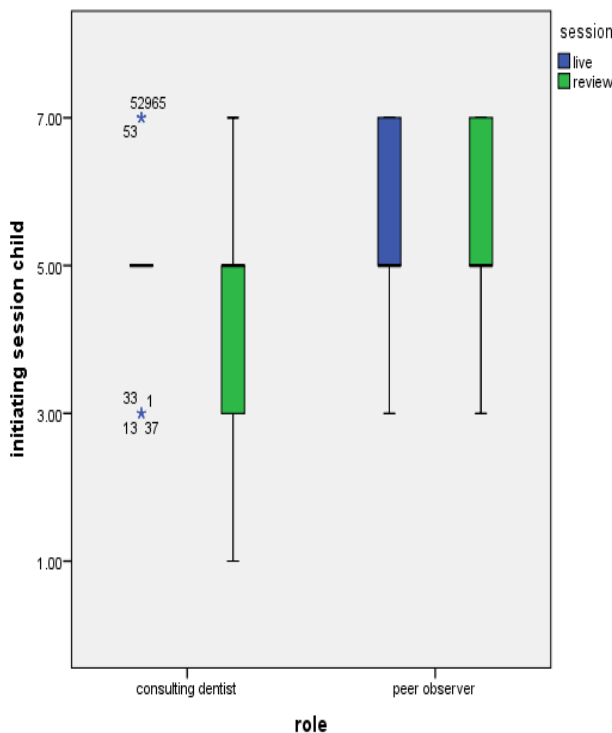


Figure 3.4 Shows a box and whiskers plot of the PCAT initiating the session with the child scores for the dentist at the consultation (live session) and one week later (review session).

The consulting dentist scores for their performance in the observation session were concentrated around five with few outliers. The consulting dentist scores for their performance decreased in the video review session, with majority of the scores between three and five. The peer observers' scores remained the same in both sessions. The majority of the peer observer scores for the consulting dentist performance were between five and seven.

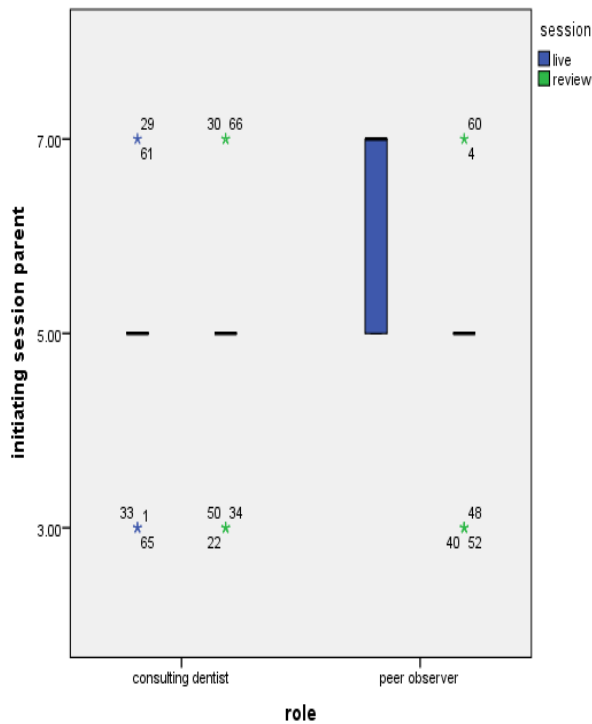


Figure 3.5 Shows a box and whiskers plot of the PCAT initiating the session with the parent scores for the dentist at the consultation (live session) and one week later (review session).

The consulting dentist scores for their performance remained similar between the two sessions and concentrated around five with few outliers. The peer observer scores in the observation session were higher than in the video review session. Majority of the scores in the observation session were either a five or seven. In the video review session the scores were lowered to be concentrated on five with few outliers.

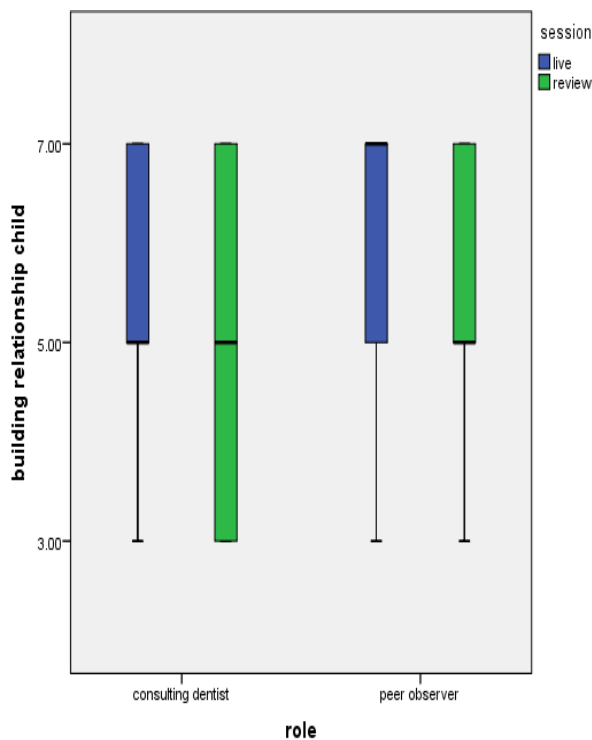


Figure 3.6 Shows a box and whiskers plot for the PCAT building the relationship with the child scores for the dentist at the consultation (live session) and one week later (review session).

The majority of the consulting dentist scores for their performance in the observation session were between five and seven with the whiskers extending to three. The consulting dentist scores for their performance in the video review session spread between three and seven with a median of five. The peer observers' scores remained the same in both sessions. The majority of the peer observer scores for the consulting dentist performance were between five and seven.

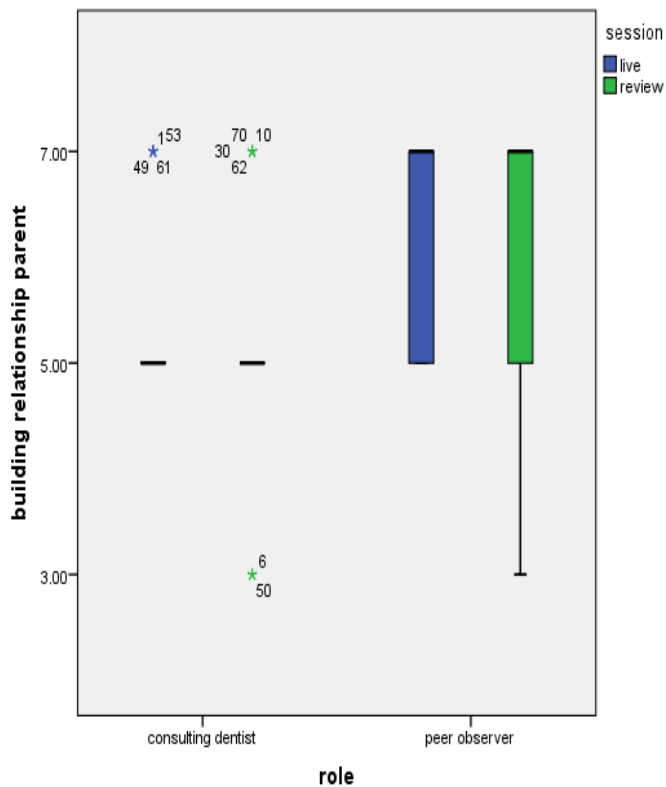


Figure 3.7 Shows a box and whiskers plot of the PCAT building the relationship with the parent scores for the dentist at the consultation (live session) and one week later (review session)

The consulting dentist scores for their performance remained similar between the two sessions and concentrated around five with few outliers. The peer observer scores in both sessions were similar with the majority of the results between five and seven. However, in the video review session the whiskers go as low as three.

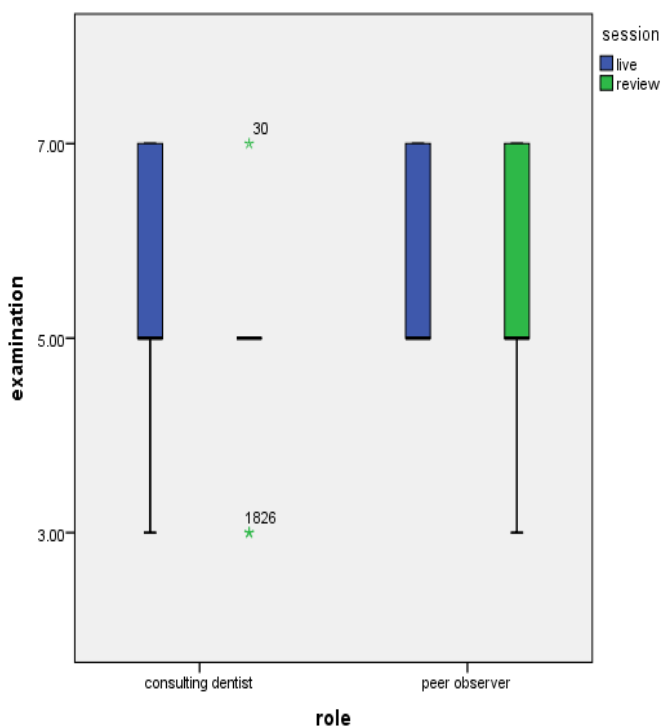


Figure 3.8 Shows a box and whiskers plot of the PCAT examination score for the dentist at the consultation (live session) and one week later (review session)

The consulting dentist scores in the observation session were higher than in the video review session. Majority of the scores in the observation session were either a five or seven with the whisker going as low as three. In the video review session the scores were lowered to be concentrated on five with few outliers.

The peer observer scores in both sessions were similar with the majority of the results between five and seven. However, in the video review session the whiskers go as low as three.

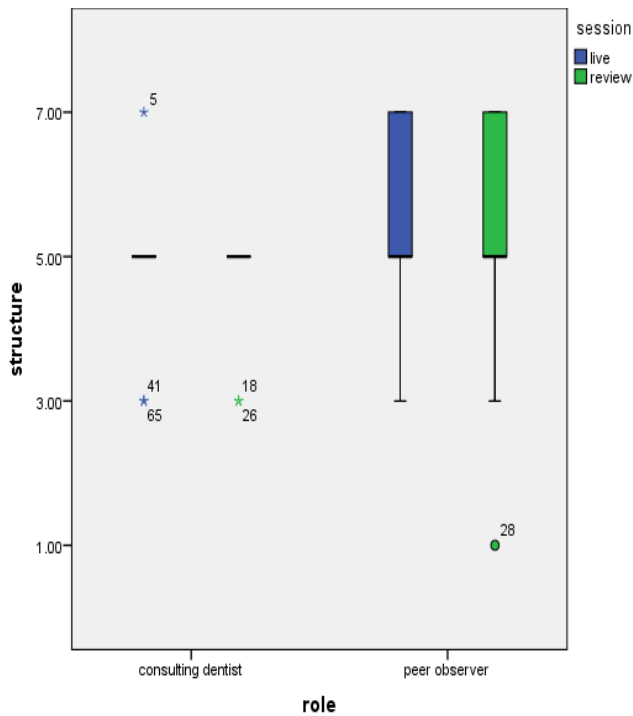


Figure 3.9 Shows a box and whiskers plot of the PCAT strutting the consultation scores for the dentist at the consultation (live session) and one week later (review session).

The consulting dentist scores for their performance remained similar between the two sessions and concentrated around five with few outliers. The peer observers' scores remained the same in both sessions. The majority of the peer observer scores for the consulting dentist performance were between five and seven with whiskers going as low as three.

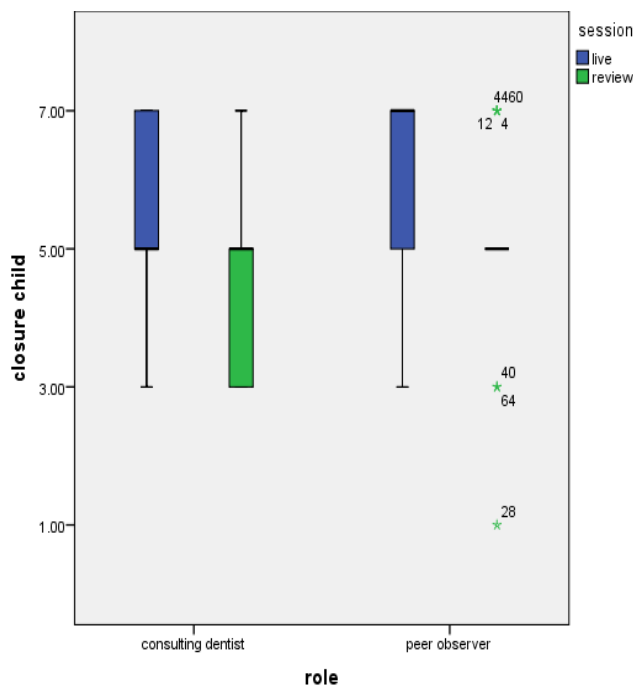


Figure 3.10 Shows a box and whiskers plot of the PCAT closure for the child scores for the dentist at the consultation (live session) and one week later (review session)

The majority of the consulting dentist scores for their performance in the observation session were between five and seven with the whiskers going as low as three. In the video review session, the scores were lowered. The majority of the scores were between three and five with whiskers going as high as seven.

The peer observers scores in the observation session were higher than in the video review session. Majority of the scores in the observation session were either a five or seven with the whisker going as low as three. In the video review session the scores were lowered to be concentrated on five with few outliers.

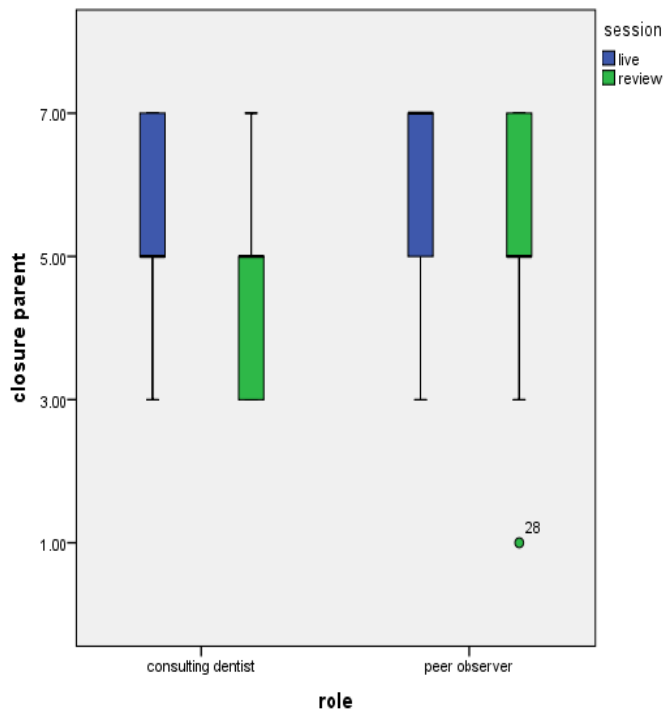


Figure 3.11 Shows a box and whiskers plot of the PCAT closure for the parent scores for the dentist at the consultation (live session) and one week later (review session)

The majority of the consulting dentist scores for their performance in the observation session were between five and seven with the whiskers going as low as three. In the video review session, the scores were lowered. The majority of the scores were between three and five with whiskers going as high as seven.

The peer observers' scores remained the same in both sessions. The majority of the peer observer scores for the consulting dentist performance were between five and seven with whiskers going as low as three.

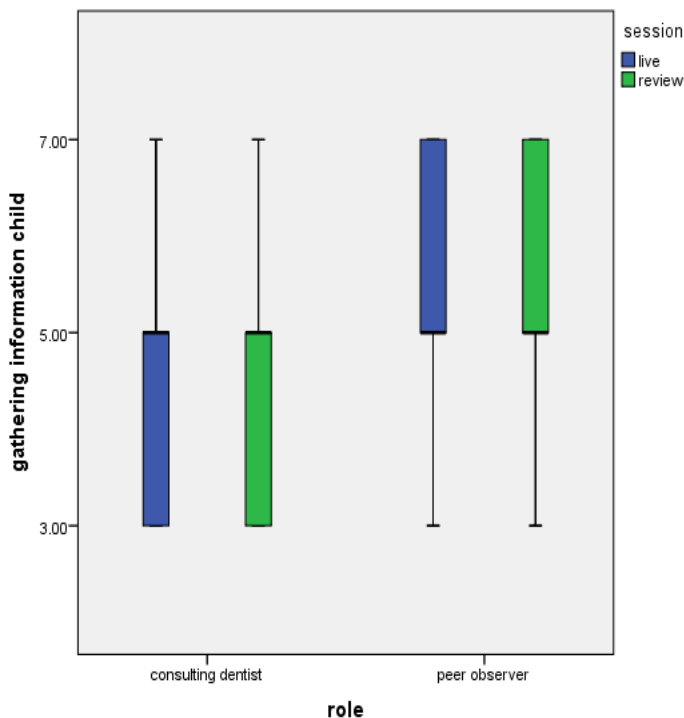


Figure 3.12 Shows a box and whiskers plot of the PCAT gathering information from child scores for the dentist at the consultation (live session) and one week later (review session).

The consulting dentist score of their performance in both sessions remained the same with the majority of the scores between three and five and whiskers extending to as high as seven.

The peer observers' scores remained the same in both sessions. The majority of the peer observer scores for the consulting dentist performance were between five and seven with whiskers going as low as three.

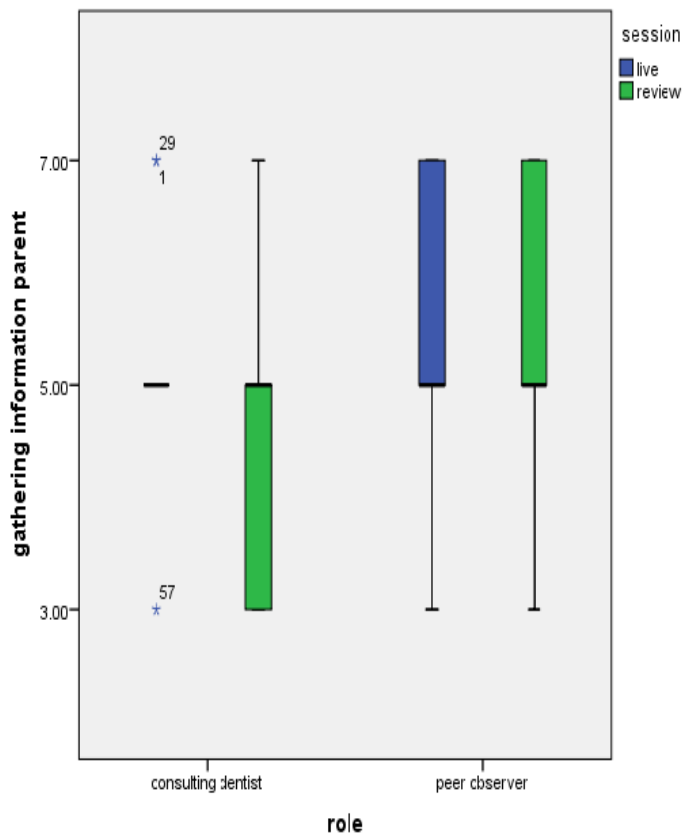


Figure 3.13 Shows a box and whiskers plot of the PCAT gathering information from parent scores for the dentist at the consultation (live session) and one week later (review session)

The consulting dentist scores of their performance in the observation session were concentrated around five with few outliers. The consulting dentist scores of their performance decreased in the video review session, with majority of the scores between three and five and whisker going as high as seven.

The peer observers' scores remained the same in both sessions. The majority of the peer observer scores for the consulting dentist performance were between five and seven with whiskers going as low as three.

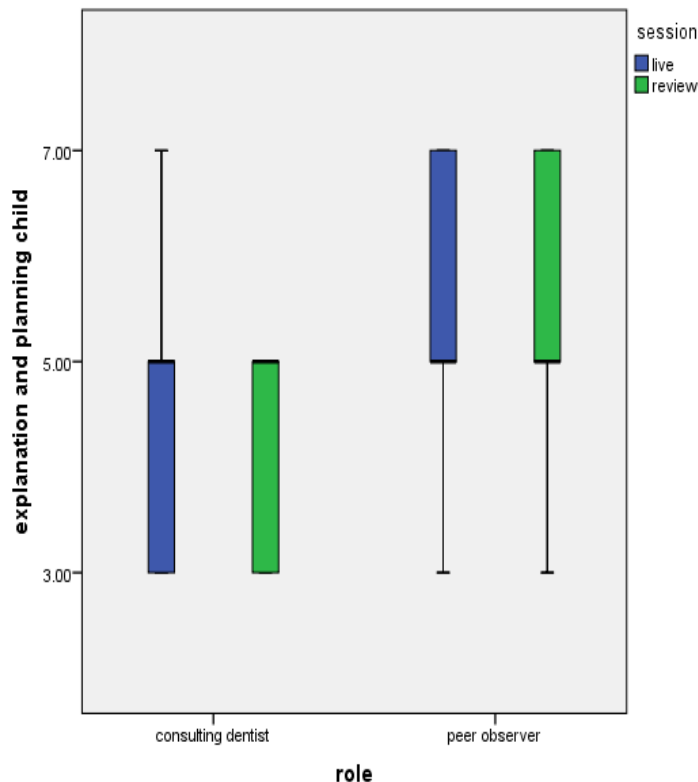


Figure 3.14 Shows a box and whiskers plot of the PCAT explanation and planning for the child scores for the dentist at the consultation (live session) and one week later (review session)

The consulting dentist score of their performance in both sessions remained the same with the majority of the scores between three and five and whiskers extending to as high as seven in observation session only.

The peer observers' scores remained the same in both sessions. The majority of the peer observer scores for the consulting dentist performance were between five and seven with whiskers going as low as three.

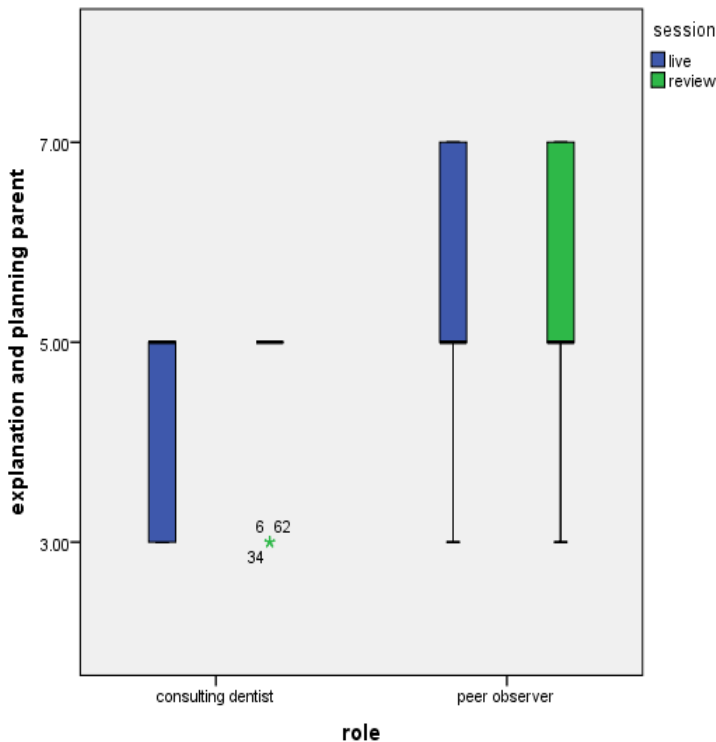


Figure 3.15 Shows a box and whiskers plot of the PCAT explanation and planning for the parent scores for the dentist at the consultation (live session) and one week later (review session)

The majority of the consulting dentist score of their performance in the observation session was between three and five. The scores were higher in the video review session with the scores centered around five with few outliers.

The peer observers' scores remained the same in both sessions. The majority of the peer observer scores for the consulting dentist performance were between five and seven with whiskers going as low as three.

3.4.1.2 Summary to compare the data of the live session and the video review session:

Generally the scores given in the live session were higher than the scores given in the video review session. A summary box and whiskers plot with all scores collated for the consulting dentist and peer observer in the consultation session and the video review session is show in Figures 16 and 17 respectively.

The scores for building the relationship with parent, structuring the consultation, gathering information, and explanation and planning for the child, remained fairly similar between the two sessions from the points of view of the peer observer and the consulting dentist. However, both the consulting dentist and the peer observers lowered their scores for the global score of the parent, initiating the session for the child, and closure of the consultation in the video

review session. The scores either remained similar between the observation session and the video tape session, or were lowered in the video review session. The only exception was the consulting dentists score for explanation and planning for the parent, where the scores were higher for the video review session compared to the live session.

Figure 3.16 : PCAT score distribution for the consulting dentist and the peer observer during the consultation session. The undergraduate students were given an assessment tool (PCAT) to score the consultation. The scores were 1(bad), 3(average), 5(good), and 7(excellent), this is shown on the Y axis.

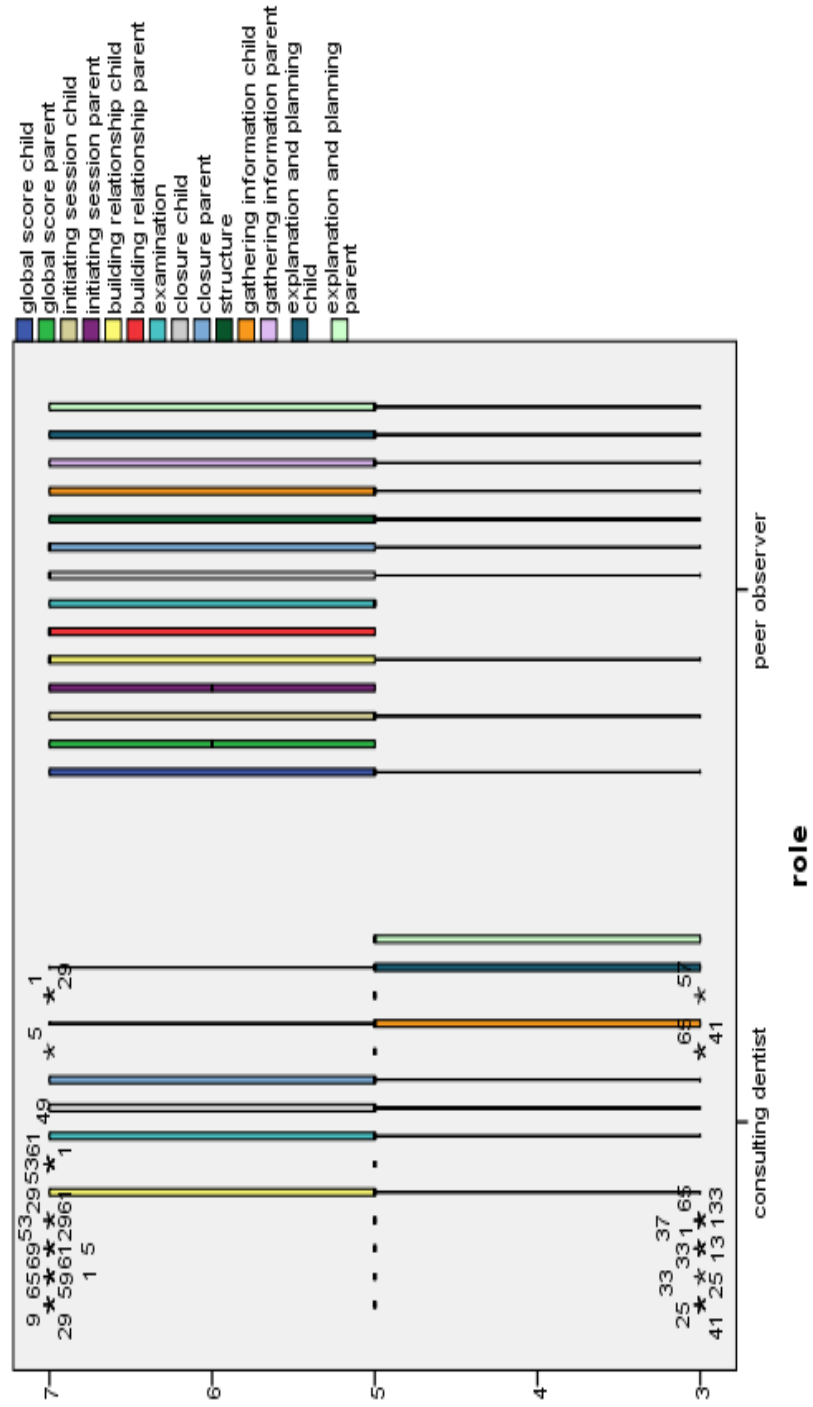


Figure 3.17 : PCAT score distribution for the consulting dentist and the peer observer during the video review session. The undergraduate students were given an assessment tool (PCAT) to score the consultation. The scores were 1 (bad), 3 (average), 5 (good), and 7 (excellent), this is shown on the Y axis.

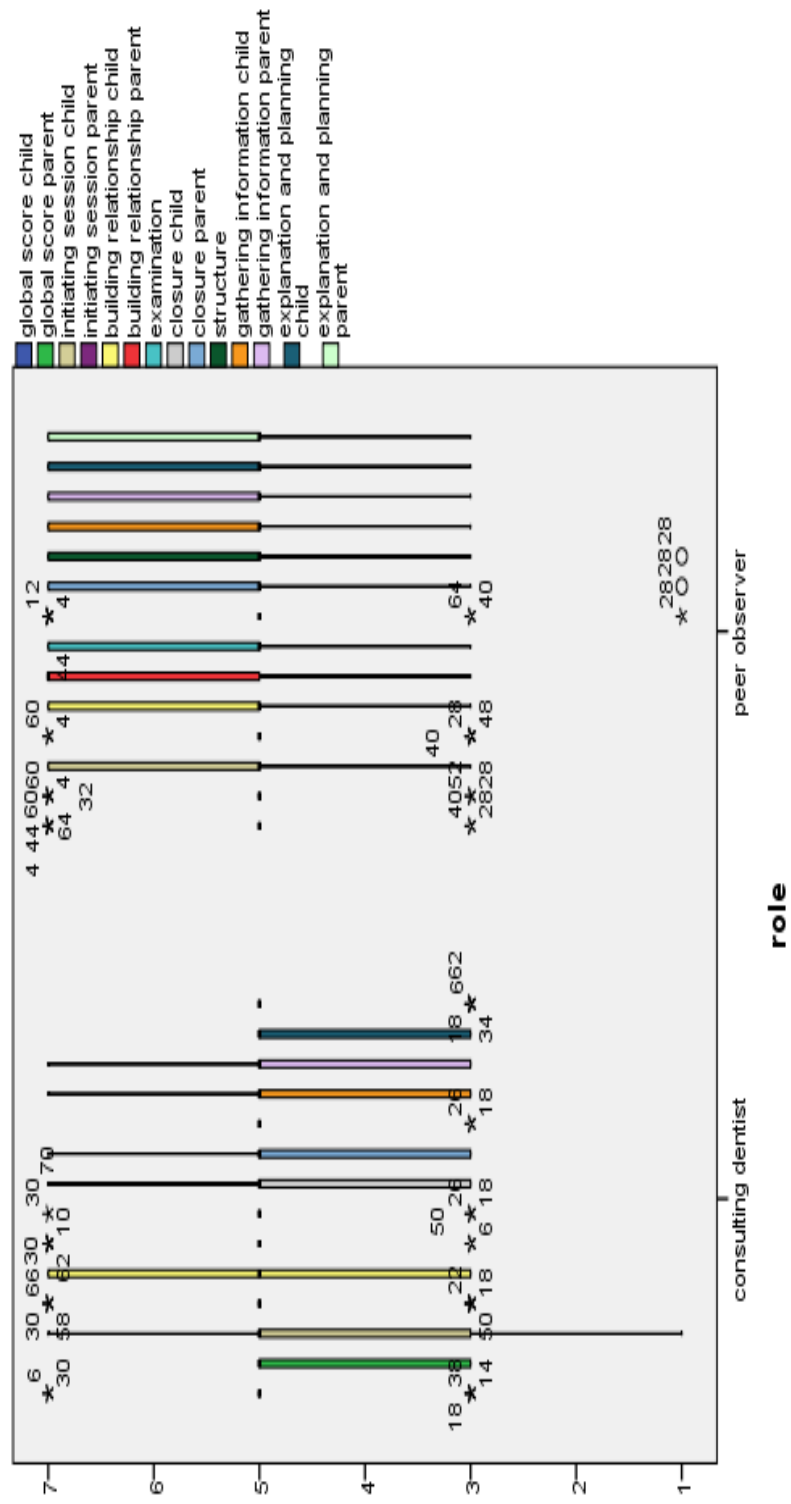
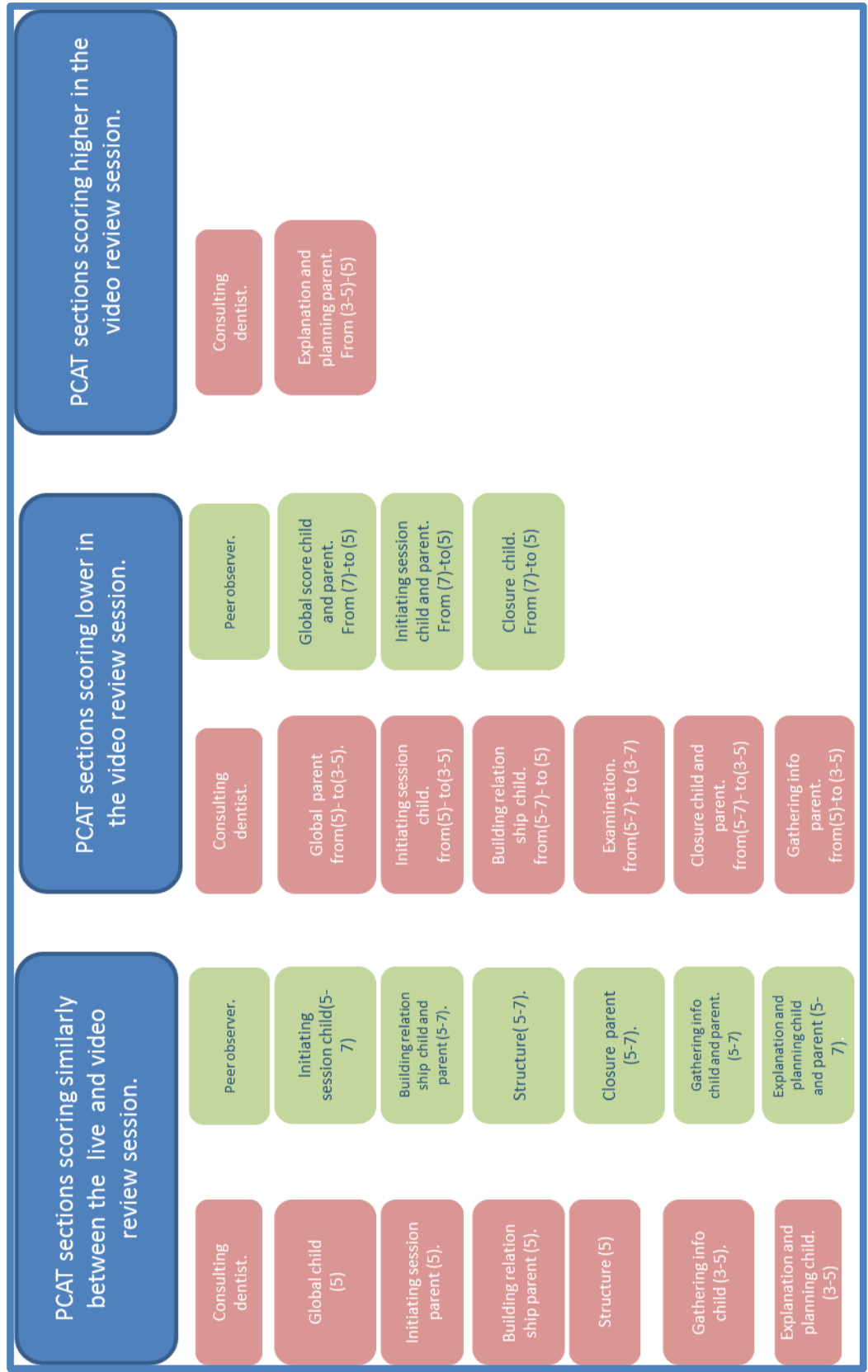


Figure 3.18 Summary of the differences in the score given using the PCAT scale between the live session and the video tape session, and the consulting dentist and the peer observer

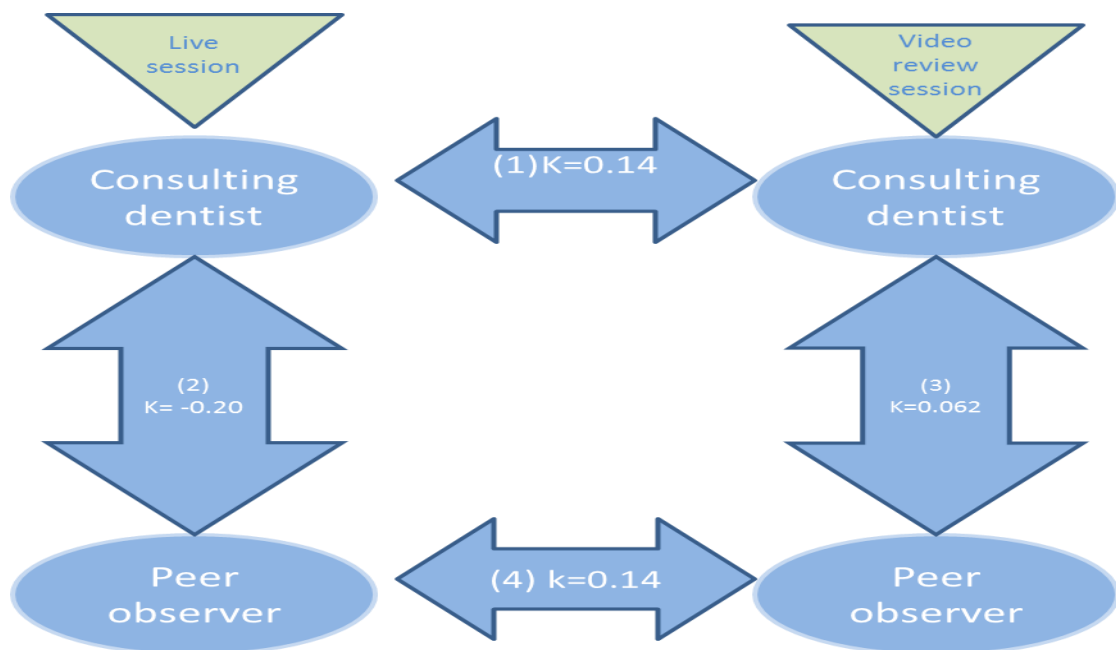


3.4.2 Agreement between the consulting dentist and the peer observer in scoring the consultation using the PCAT.

The PCAT scores of the consultation were examined, to assess the inter-and intra-agreement for the consulting dentist and the peer observer in scoring the consultations. Cross-comparisons were employed. Four possible ways of comparisons were possible for each category (Figure 3.19):

- 1) Consulting dentist in live session and the consulting dentist during the video review session (intra-agreement for consulting dentist).
- 2) Consulting dentist during the live session and the peer observer during the live session (inter-agreement).
- 3) The consulting dentist during the video review session and the peer observer during the video review session (intrar-agreement).
- 4) Peer observer during the live session and the peer observer during video session (intra-agreement for the peer observer).

Figure 3.19: Cross-comparison between the scores of the two sessions and the consulting dentist and the peer observer scores. Four ways of comparisons were possible. K represents Cohen's Kappa.



The inter-and-intra-agreement was computed using Cohen's Kappa. The results of the global Kappa scores are shown in Figure 3.19. The intra-rater agreement for the consulting dentist and the peer observer in the two sessions was 0.14 indicating only a slight agreement

The inter-rater agreement between the consulting dentist and the peer observer in the live session was $K=-0.20$. The negative value kappa indicates that the proportion of agreement by chance, between the consulting dentist and the peer observer in the live session, exceeds the proportion of true agreement.

Table 3.3 shows the inter-and-intra -rater agreement for the consulting dentist and the peer observer in each PCAT category. The Kappa value ranged from highest $K=0.38$ (fair intra-agreement for consulting dentist in the live session for category initiating the session) to lowest $K= -0.91$ (no inter-agreement between the consulting dentist and the peer observer in the live session for the explanation and planning category of the PCAT).

Generally the inter-and intra-rater agreement were either slight or non-existing and were not clinically acceptable.

Table 3.3: Shows the agreement using Cohen's Kappa between 1, 2, 3, and 4 for each PCAT category.

- 1) Consulting dentist in live session and the consulting dentist during the video review session.
- 2) Consulting dentist during the live session and the peer observer during the observation session.
- 3) The consulting dentist during the video review session and the peer observer during the video review session.
- 4) Peer observer during the live session and the peer observer during the video tape session.

| PCAT category | 1 | 2 | 3 | 4 |
|---|-------|--------|-------|--------|
| Building the relationship with child. | 0.284 | 0.17 | -0.18 | 0.32 |
| Building the relationship with parent | 0.100 | 0.11 | 0.18 | 0.05 |
| Initiating the session for child | 0.38 | -0.15 | 0.15 | 0.03 |
| Initiating the session for parent | 0.23 | 0.05 | 0.05 | 0.09 |
| Gathering information from child | -0.05 | -0.16 | 0.27 | 0.37 |
| Gathering information from parent | -0.18 | 0.27 | 0.100 | 0.35 |
| Physical exam | 0.012 | -0.047 | 0.01 | -0.05 |
| Explanation and planning with the child | 0.37 | -0.13 | -0.05 | 0.32 |
| Explanation and planning with parent | 0.18 | -0.91 | 0.32 | 0.23 |
| Closure with child | 0.08 | -0.015 | 0.18 | -0.005 |
| Closure with the parent | 0.10 | -0.24 | 0.22 | -0.14 |
| Structuring the consultation. | -0.16 | 0.20 | -0.05 | 0.01 |
| Global score for the child. | 0.31 | 0.05 | -0.05 | 0.11 |
| Global score for the parent. | 0.17 | 0.05 | -0.08 | 0.200 |

3.4.3 Patient satisfaction questionnaire data:

The parental satisfaction questionnaire consisted of 16 questions. Each question was rated on a Likert scale from 1- the worst I can imagine to 5- the best I can imagine. Twenty-one parental satisfaction questionnaires were completed. Three questionnaires were excluded from the study owing to reasons described above for the undergraduate student groups in section 3.1.

Five parents considered their overall consultation with the undergraduate student to be better than most consultations (4 on Likert scale). The remaining parents rated their consultation as the best they can imagine (5 on Likert scale).

The parental responses varied for individual questions within the satisfaction questionnaire between the best I can imagine (5 on Likert scale), and better than most (4 on Likert scale). One parent rated questions six, twelve, and thirteen, to be the same as most doctors (3 on Likert scale) as shown in Table 3.4. These questions related to; “how good with parents is this dentist”, “How well the dentist listened”, and “How well the dentist understood the parent.

| | The best I can imagine (5) | Better than most (4) | Same as most dentist (3). | Worse than most (2). | The worst I can imagine (1). |
|--|----------------------------|----------------------|---------------------------|----------------------|------------------------------|
| Global score | 13 | 5 | 0 | 0 | 0 |
| Q1: How much opportunity were you given to discuss or do the things you wanted? | 11 | 7 | 0 | 0 | 0 |
| Q2: How happy are you to follow the dentist's suggestions and treatments? | 16 | 2 | 0 | 0 | 0 |
| Q3: How well do you think you understand your child's condition(s) now? | 12 | 6 | 0 | 0 | 0 |
| Q4: How well do you understand your child's treatment(s) now? | 13 | 5 | 0 | 0 | 0 |
| Q5: How confident do you feel in looking after your child's condition(s) now? | 15 | 3 | 0 | 0 | 0 |
| Q6: How good with parents is this dentist? | 15 | 2 | 1 | 0 | 0 |
| Q7: How good with children is this dentist? | 16 | 2 | 0 | 0 | 0 |
| Q8: How much was the dentist interested in your point of view when he/she was asking questions? | 13 | 4 | 1 | 0 | 0 |
| Q9: How much was the dentist interested in your point of view when he/she was planning and explaining things? | 13 | 5 | 0 | 0 | 0 |
| Q10: How much was the dentist interested in your child's point of view when he/she was asking questions? | 12 | 6 | 0 | 0 | 0 |
| Q11: How much was the dentist interested in your child's point of view when he/she was planning and explaining things? | 13 | 5 | 0 | 0 | 0 |
| Q12: How well do you feel the dentist listened to you? | 14 | 3 | 1 | 0 | 0 |
| Q13: How well do you think the dentist understood you? | 14 | 3 | 1 | 0 | 0 |
| Q14: How well did the dentist explain things? | 15 | 3 | 0 | 0 | 0 |
| Q14: Overall, how satisfied are you with the dentist in this consultation? | 16 | 2 | 0 | 0 | 0 |

Table 3.4: Parent response to the parental satisfaction questionnaire. The numbers represent the number of parents giving a specific score to each question.

3.4.4 Correlation between the global scores of the parent satisfaction questionnaire and the global scores of the PCAT.

The PCAT scale included two global scores, one reflecting the overall dentist performance with the parent and the other reflecting the overall performance of the dentist with the child. Correlation between the parent satisfaction questionnaires' global score, and the consulting dentist and peer observer global scores, for the consultation using the PCAT scale, was tested using Spearman's correlation coefficient. Table 3.4 shows the rho values and the p-values. The rho values ranged from the lowest -0.061 (no correlation between the parents satisfaction global score and the consulting dentist global score for the child in the video review session) to the highest -0.40 (moderate to low correlation between the parents satisfaction global score and the peer observer global score for the parent in the video review session).

The positive values indicate a positive relationship and the negative value indicates a negative relationship. The p-value was considered statistically significant at the 5% level or less. As shown in Table 3.5, none of the p-values were significant indicating that even where low to moderate agreement was shown, the correlations were not significant. Therefore, it can be concluded that there was no correlation between the parental global satisfaction and the PCAT global scores.

Table 3.5: Shows the correlation between the global scores of parental satisfaction and the global scores of the PCAT. Statistically significant results at 5% level or less.

| Role | Session | Global Parent satisfaction score correlated with global score of PCAT scale for: | Spearman's correlation coefficient (rho) | Significant (2-Tailed) value |
|--------------------|--------------|--|--|------------------------------|
| Consulting dentist | Observation | Child | -0.215 | 0.4 |
| | | Parent | -0.215 | 0.2 |
| | Video review | Child | -0.061 | 0.8 |
| | | Parent | 0.014 | 0.9 |
| Peer observer | Observation | Child | -0.081 | 0.8 |
| | | Parent | -0.124 | 0.6 |
| | Video review | Child | -0.115 | 0.7 |
| | | Parent | -0.410 | 0.091 |

4.0 Discussion

Communication skills are an important and integral component in the dentists' skills set, especially in the area of Paediatric dentistry, where the dentist has to communicate with the child and the parent at the same time.

The area of teaching communication skills in dentistry is relatively new compared to the medical field. Previous studies have shown that undergraduate dental students value and appreciate communication skills teaching (Gorter and Eijkman, 1997, Hannah et al., 2004). Furthermore, the literature has shown that communication skills can be acquired if the appropriate learning methods were used (Evans et al., 1991, Campbell et al., 1996, Haak et al., 2008).

The use of video as a teaching tool has been shown to be an effective method in teaching communication skills especially as a method of providing feedback (Black and Wiliam, 1998, Fluckiger et al., 2010). There are no studies in the literature to date which investigate undergraduate dental students' preference in how they receive feedback on their communication skills.

Therefore, this study aimed to compare the students' preferences to videotape and observer peer reviews in evaluating undergraduate dental students' communication skills during a child's initial dental consultation. If students' preferred the peer review, then there is little point in using video reviews as this method requires more resources with respect to time and equipment. Preference is an attitude which cannot be measured objectively. The best way to assess the students' preference was by asking them what they preferred and their reasons behind their choice. A qualitative questionnaire was therefore chosen to assess their preference.

In addition, this study aimed to examine the intra- and inter-observer agreement of an established Paediatric Consultation Scale (PCAT) over a one-week period for evaluating a dental student consultation with a child-patient and their parent. This secondary aim was designed to help assess if the students' scoring was consistent and comparable.

Finally, this study aimed to assess the correlation between parental opinions concerning the quality of the consultation and the students' evaluation of the consultations using the PCAT scale. The parental opinion was to be used as the gold standard against which to compare the undergraduate PCAT scores. After all, the dentist opinion about the quality of the consultation can be of little value if it is opposite to the patients' opinion.

4.1 Study design:

4.1.1 Participants:

Subjects participating in a study should be representative of the population in which the results are intended to be applied to. Participants for this study comprised undergraduate dental students and children and their parents.

4.1.1.1 Childr participants:

A convenient sample of twenty-one children and their parents, attending Leeds Dental Institute for an initial consultation in the undergraduate paediatric dental

clinic, participated in the study. These children were selected because they were between the ages of 5-11 years (primary education age). Children in primary education were selected based on the fact that by the age of five years old the child can speak fluently and their vocabulary comprised around 5000 words. They start to understand jokes and can use more complex sentences (Berman, 2009). Younger children have limited vocabulary and their verbal communication is somewhat limited which requires a different set of verbal communication skills that the undergraduate students are less likely to possess. Children older than 11 years old offer limited challenge to the undergraduate students as they can be communicated with in similar way as adults.

The sample of children/ parents chosen had the potential to be a bias selection as it was convenient in nature. However, randomisation was not possible as a limited amount of children/parents satisfied the inclusion criteria in each initial consultation session. In addition, the child/parent was already allocated to an undergraduate student. In order to include the child/parent in the study we had to make sure that the undergraduate student, who they were allocated, agreed to participate in the study, and that the undergraduate student had not already participated in the study.

As this study was looking at communication skills, it was thought that initial consultations would be the most suitable clinical session to include, as the main aim of it was to communicate with the child and the parent to reach consensus on treatment. The aim of other clinical session was to complete the dental treatment. Of course, during treatment sessions there was an abundance of communication between the child/parent and the dentist. However, including treatment sessions can introduce bias into the study as each treatment would

most likely need a different set of communication skills and different ways to assess these skills.

Children and/ or their parents that did not speak English fluently were excluded from the study as the use of an interpreter increased the complexity of the communication skills needed. It also increased the difficulty in assessing the undergraduate students' communication skills as the communication would be taking place through an interpreter.

Parent/child patient with special communication needs and any child patient registered on the child protection plan (previously called "the at risk register") were excluded from the study. The register contains, according to the National Society for Prevention of Cruelty to Children (NSPCC), "confidential details of children who are at continuing risk of physical, emotional or sexual abuse or neglect, and for whom there is a child protection plan." These patients were excluded because they need special communication skills that undergraduate students are unlikely to process, and therefore an early exposure to these children would not be appropriate.

4.1.1.2 Undergraduate dental students' participants:

Undergraduate students were chosen to participate in the study because the literature showed they consider communication skills teaching to be an important and relevant part of their undergraduate curriculum (Gorter and Eijkman, 1997, Hannah et al., 2004). GDC also requires that a communication skill is a mandatory component of the undergraduate curriculum including communication with children.

Initially it was planned for the study to be carried out with third year undergraduate students as they entered their third term. In the third term of the third year the students have just started their paediatric dentistry clinical training. An earlier research study at Leeds Dental Institute reported that student need support in their early stages of paediatric dentistry (Bank, 2007).

However, the study was delayed as a result of the ethics processes required. Initially it was thought that the approval of National Research Ethics Service (NRES) and Leeds Research and Development Directorate (R&D) would be sufficient. During the transfer viva, it was recommended by the internal assessor, Professor Manogue, to obtain ethical approval from the Educational Research Ethics Committee (EDREC) at the University of Leeds in addition to NRES and R&D approvals. Therefore, the approval of EDREC was sought and obtained. EDREC approval was contingent on some amendments, which were carried out. The amendments were then submitted to NRES and R&D for final approval. This resulted in approximately eight months delay which meant that the students had already spent eight months in the paediatric clinic.

It is likely that using fourth year students may well have been beneficial. Students will have had a small exposure to treating children, but still in need of significant support. This would have included help with communication skills.

All students were initially trained. The sample of undergraduate students used may have introduced a biased sample as undergraduate participants had to be willing and have consented to participation. Initially undergraduate students showed some hesitation to participate at the beginning of the study, and this resulted in some undergraduates refusing to participate. As the study progressed, positive feedback from the participating undergraduate students

circulated and the majority of the undergraduate students welcomed the opportunity of participation in the study. Therefore, the sample of undergraduate students was likely to be representative of fourth year student population.

4.1.2 Study instruments:

4.1.2.1 Qualitative questionnaire:

The qualitative questionnaire was developed to evaluate two methods for providing students with feedback. There were a number of different approaches other than questionnaires to evaluate new teaching methods, such as a randomised control trial to compare the clinical performance of two groups (an intervention group with the new teaching method and a control group). This method is more scientific in nature, but it is more complex and would not be able to measure the preference of the students. The students' performance might improve with one method but they might not prefer it and therefore would not be able to embrace.

The main aim of the study was to assess the preference of the undergraduate students towards the two teaching methods. The simplest way to do that was to ask them through a questionnaire of their preference and the reasons behind it.

There are no studies in the literature to compare the students' preference in receiving feedback, especially in reference to peer review versus video review. Consequently, a questionnaire was developed by the researcher (MA) and the supervisors for this study, based on the 13 principal criteria for questionnaires (Johnson and Turner, 2003). The questionnaire started with an open ended

question to allow the participants to answer without restrictions. The remainder of the questions were developed such that each question contained a closed ended part in the form of YES/NO and an open ended component. The closed ended part was easily quantified and provided an overall view of the participants' preference with minimal interpretation bias. The open ended part aimed to collect responses, which revealed the reasons behind the participants' preferences.

Questionnaires can be administered in different ways, such as face to face interviews, telephone interviews, or self-administered. In this study, a self-administered questionnaire was used. The questionnaire was given to the participants by the researcher (MA) to ensure a high response rate. Students were left to complete the questionnaire with minimum explanation to the participants (Oppenheim, 2000). Self-administered questionnaires increase perceived impersonality and may encourage reporting of important and sensitive information, which can be embarrassing in person (Bowling, 2005).

Anonymity was not possible due to the design of the study. Even though the questionnaire did not require the students' identifications, it was still possible to identify the students through the videos by the researcher (MA). Having said that the researcher (MA) was not a member of staff and the students were assured that the staff members would not have access to any data, through which they will be identifiable. Also, the researcher (MA) assured that the students understood the aim of the study, to increase the perceived impersonality of their opinions to the researcher (MA).

4.1.2.2 **Communication skills rating scale:**

The literature contains a large number of scales to assess the quality of a doctor/patient's consultation. The PCAT was used in this study (Howells et al., 2010). The PCAT was the only scale available in the literature that was able to assess the clinical communication skills with the parent and the child simultaneously but separately. This was important as in paediatric setting, communication takes place between the child and the parent. Furthermore, the scale was designed to be used in a paediatric setting and required no modification for the dental setting. The scales contained descriptive marking keys which helped the assessor to evaluate the consultations with minimal training.

The undergraduate students were given training for 60 minutes on how to use the PCAT which was thought to be sufficient to prepare the student to use the PCAT in the clinical sessions.

The PCAT scale validity has been tested and demonstrated to be appropriate in assessing the quality of a clinical consultation (Howells et al., 2010). Also, the generalizability reliability had been tested and produced a coefficient of 0.80 for two consultations per physician, which was considered sufficient (Schumacker, 2005). Initially it was intended that the inter-rater reliability of the PCAT scale would be assessed during the undergraduate training period. Each undergraduate student would complete a PCAT scale while watching the simulated consultations on video. However, it was quickly noticed that the students were not keen to participate. Realising that this could reduce the quality of the training, the researcher (MA) assigned the students to small groups to encourage participation. A group of two to three undergraduate

students completed a single PCAT scale to evaluate the simulated consultation on video. This helped to encourage interaction among undergraduate students. This type of interaction helped retain the information they received during the tutorial, but resulted in the inability of assessing the inter-rater reliability of the PCAT scale.

4.1.2.3 **Parent satisfaction tool:**

Owing to the fact that parents of child patients are in a good position to judge the dentist/child-patient interaction (Crossley et al., 2005), and that in particular parents play an active role in their child's treatment, it was decided to measure the parental satisfaction rather than the child's satisfaction. The parents were in a position to act as active participants in the consultation and as observers. They have sufficient maturity to judge the dentist interaction with adults (the parent) and the dentist interaction with the child.

The parent-dentist interaction tool was used for this study (Crossley et al., 2005). The parent-dentist interaction was the only instrument available in the literature that measured the parental satisfaction and could be adapted to dentistry without modification. Few scales were developed to measure the child's satisfaction, but these scales were developed in the medical field, and measured the child-physician interaction only and not the child-parent-physician interaction (Rifkin et al., 1988, Simonian et al., 1993). As mentioned earlier, in a paediatric setting the interaction takes place with the child and the parent. Including the child's opinion of the dentist-child patient interaction only would have meant that the evaluation of the success of the consultation was incomplete. For the purpose of this study, one satisfaction scale was needed to measure the success of the consultation from the point of view of the child

patient and the parent. It would have been possible to include a child satisfaction scale as well as a parental satisfaction scale, but that would have complicated the interpretation of the result.

The parent-dentist interaction was easy to use as it contained lay language that could be easily understood by the parents. It was short and could be completed in less than five minutes, which could have increased compliance in completing the instrument. The generalisability reliability of the instrument was measured to be $G=0.7$ for 15 raters, which is considered to be sufficient for early stages of research, but further research is needed to increase the generalisability reliability to 0.8 or higher (Schumacker, 2005). Even though the generalisability reliability was less than ideal, this did not affect this study as we were looking at correlation between two different instruments (PCAT vs. the parent satisfaction instrument) rather than agreement or reliability.

4.2 Discussion of the Results:

4.2.1 Discussion of qualitative questionnaire results.

The main aim of this research was to compare students' preferences of videotape and observer peer review in evaluating undergraduate dental students' communication skills during child initial consultation. This was accomplished through analysis of the qualitative questionnaire.

There are several methods available to analyse qualitative data. The analysis of data can be done either manually or through the assistance of computers. The use of computers to assist in the analysis of the qualitative questionnaire could

have its advantages and disadvantages. It can increase the speed with which large data are handled, and could improve the consistency of approach. It facilitates team research, help with conceptualisation of data, and facilitate easy navigation and linking of data. The ease with which the computers have assisted data analysis have come with some disadvantages, as it can encourage researchers to take short cuts (Weitzman, 1999). Having said that, the value of the computer assisted analysis cannot be denied especially for large data, but it needs to be used with caution and the understanding that the role of the researcher in analysing the data is crucial. For the purpose of this research, it was decided to use manual qualitative analysis as this had helped the researcher (MA) to understand the analysis process.

The qualitative data can be analysed using different approaches depending on the primary aim and focus of the study. For the purpose of this study, framework analysis was used to analyse the data. Framework analysis offers a clear logical series of steps to guide the analytical process. It provided structure to the researcher, who had no previous experience in qualitative research, to aid in the process of analysing the data and the development of the skills to perform a robust qualitative analysis in the future.

The first open ended question revealed that all participants preferred to have the video review session. This was further supported by the second question, where all students answered YES they benefited from the video review session. Furthermore, all peer observers expressed that they would like to have one of their consultations recorded for a video review. These results clearly demonstrated the students preference for video review. There are no other studies to assess the students' preference to peer review or video review.

However, the literature contains several studies, where the students acceptance of the video review methods has been demonstrated (Kalwitzki et al., 2003, Hammoud et al., 2012) . In these research studies the students' acceptance to the video review was most of the time compared to a control group where no alternative teaching method was offered, and therefore it demonstrated acceptance and not preference. This research study demonstrated preference which also implies acceptance.

In question three, students were asked if they were able to identify different communication issues between the consultation and the video review. The majority of the undergraduate students answered "Yes" they were able to identify different communication issues except for nine undergraduate students, of which six were peer observers. This could be attributed to the fact that that these six peer observers had the chance to observe the full consultation during the clinical session with minimal distraction, which allowed them to identify the majority of the communication issues.

All participants except for two peer observers agreed that the video review helped them to develop their communication skills. One study conducted on undergraduate medical students compared the effectiveness of video feedback to verbal feedback in teaching communication skills (Ozcakar et al., 2009). They found video feedback to be superior to verbal feedback. Even though in this study the feedback was given by peers the students felt the same way in that video reviews were beneficial in developing communication skills. The two peer observers that reported no benefit from the video review session, might have lacked the interest in critiquing someone else, and preferred to have their own performance critiqued. This interpretation maybe further supported by the

response of the peer observers to the last question, where they all responded YES they would like to have one of their consultations video recorded for review.

Almost all of the students found the PCAT scale to be a useful tool in evaluating the consultation. The PCAT scale offered a structured and a systematic approach to their evaluations of the consultations. This therefore increased the quality of the feedback. Some concerns were voiced regarding the use of the PCAT scale related to its length of the PCAT scale and its complexity. At first the PCAT scale looked lengthy due to the presence of the descriptors. Furthermore, it can be a bit confusing, if participants struggled to understand how to score the parent and the child simultaneously but separately.

The consulting dentist found that the peer observer helped them to assess their consultation. A literature review of peer assessment between students in universities found that, the acceptance of peer review varied depending on the subject being assessed. However, there was acceptance of peer assessment in the area of professional skills (Topping, 1998). One consulting dentist denied the benefit of the peer observer. This may be attributed to the lack of confidence in their peer's ability to evaluate their performance as they have the same training. This may have been related to the lack to the lack of choice in whom the students could choose as their peer observer. This may have led to a lack of confidence or respect in this peer's opinion.

The participants strongly preferred the video review session over the peer review sessions. Their responses were further analysed to explore the reasons behind their preference. This revealed that the participants found the video review to be more objective than the peer review. It allowed them to evaluate

the consultations away from any clinical distractions, which allowed identification of different communication issues. The video review allowed the consulting dentist to reflect on their own performance, which helped them to understand the critique and served as a strong reminder of good as well as bad habits. It also reduced the chances for denial, as the critique could be heard and visualised, rather than simply relying on memory of the event. This was in agreement with the study of Nilseen and Baerheim, where the students found it easier to agree with the critique after they had watched the video themselves (Nilsen and Baerheim, 2005).

Another benefit that the students identified was the fact that these videos could be used as a permanent record to monitor their progression. The videos could be accessed for critique and reflection whenever needed, without having to rely on a peer observer. This was in agreement with the Kalwitzki and co-workers study where the students accepted the use of video and even suggested a wider benefit for it (Kalwitzki et al., 2003).

The majority of the communication skills training that the participants received during their undergraduate training was based on communication with adults using standardised patients. Therefore, the participants appreciated the opportunity the video tape review offered them by applying theoretical learning to clinical applications. The literature showed that undergraduate medical and dental students appreciated the importance of communication skills training in their curriculum (Kaufman et al., 2000, Rees et al., 2004, Nor et al., 2011). The best way to teach communication skills is through experiential methods which the video review offers to the students.

The students' preference for the video review came with a few concerns. The students were worried that the presence of the camera would increase their anxiety and in turn affect the quality of the consultation. They suggested the use of more subtle camera. This was in agreement with the Kalwitzki and co-workers study where small number of students felt uneasy because of the presence of the camera and they felt that this would negatively influence the quality of the consultations (Kalwitzki et al., 2003)

Some participants suggested that the video review should be delayed until they had gained more experience. However the literature showed that early support is needed (Bank, 2007). Furthermore, a delay in identifying bad habits would reduce the benefit of the video reviews. Early identification of bad habits can help students to identify and correct them. The students were nervous regarding being videotaped, which is completely understandable as it is foreign concept to them. Students had voiced their fear of being videotaped throughout the study, and it was clear from their attitude at the beginning of the study where some refused to participate. However, after having watched the video they expressed that they forgot completely the presence of the camera and felt more comfortable after watching the video. This finding was in agreement with a qualitative study focus group of medical students (Nilsen and Baerheim, 2005).The group were concerned prior to being videotaped, but after the video review session, the undergraduate students found that their fears had no grounds. Undergraduate anxiety reduction can also be related to how the video was reviewed; with a small and private group where help and advice was given in a positive manner.

4.2.2 Result of agreement between the consulting dentist and the peer observer in scoring the consultation.

The data distributions of the PCAT scale indicated that the consulting dentists were generally scoring themselves lower than the peer observers. The consulting dentists were harsher critics of themselves. The peer observer might have lacked the same passion and interest that the consulting dentist possessed to evaluate the consultation, as it was for someone else. Also, the peer observers might have felt the pressure of embarrassment in assessing their peers and therefore scored the consulting dentist higher. A qualitative questionnaire by Arnold showed that students struggled with reporting their peer assessment as they feared it might harm their peers, themselves, or the clinic group (Arnold et al., 2005).

The first secondary aim was to test the agreement between the consulting dentist and the peer observer in scoring the consultation. This was accomplished through Cohen's Kappa.

The intra-rater agreement between the consulting dentist and the peer observer in the two sessions showed a slight agreement. The inter-rater agreement between the consulting dentist and the peer observer in the two sessions indicated poor agreement.

Even though the inter- and intra-rater agreements were either slight or non-existent, a pattern can be detected. The ratters showed a slight intra-rater agreement but lacked inter-rater agreement.

The qualitative questionnaire indicated that the undergraduate students liked the use of the PCAT (as discussed in the previous section). However the PCAT

scale scores were not reliable. The lack of reliability could be contributed to the lack of experience among undergraduate students as they were at the beginning of their paediatric dentistry education. Another point to consider, was the fact that the PCAT scale scoring is on an interval of 1,3,5,7, which meant that each scoring category covered a wide range of criteria. Therefore, the PCAT scale could be considered as a great informative scale, but it might need to be modified to be used as a summative scale.

4.2.3 Results of correlation between the global score of the parent satisfaction questionnaire and the global scores of the PCAT.

The second secondary aim was to assess the correlation between the global scores of the parents' satisfaction questionnaire to the global scores of the PCAT. The most common correlation statistical test is the Pearson rank correlation, which measures the linear relationship between normally distributed data. Furthermore, the Pearson rank correlation requires the data to be on an interval scale. Our data are not normally distributed and on an ordinal scale, so it was decided to use the Spearman's rank correlation. The Spearman rank correlation makes no assumption about the distribution of the data and can be used with data on an ordinal scale.

The Spearman correlation test showed very low correlation (not clinically acceptable) between the parent satisfaction global score and the global scores of the PCAT. The one exception was the correlation between the parent satisfaction global score and the peer observer global score for the parent in the video review session. This showed a negative moderate to low correlation.

However, the p-value was non-significant indicating that the negative correlation occurred by chance rather than it being true. Also, if it was true this would have showed that as one score increased (e.g. better consultation) the other decreased (e.g. worse consultation).

The majority of the parents rated their experience to be the best they could imagine (highest possible score), and few rated their experience to be better than most (second highest score). These results were attributed to the fact that the parents were comparing their experience at a specialist centre to their experience at a general dental practitioners' (GDP) clinic. The majority of these children had received little dental treatment at the GDP clinics or their early treatment failed due to lack of cooperation. This meant that the parent may have had to deal with the child's pain until they were seen at the specialist centre. At the specialist centre they were given time to discuss the various treatments options with their dentist in a child-friendly atmosphere. This probably reassured them as they could see their child was in an environment where care would progress at a speed appropriate to their child's cooperation.

There were no studies in the literature to evaluate the correlation between the parent satisfaction and the students' assessment of the communication skills used during the consultations. The only correlations that were tested were between standardised patients and teachers assessment of the same consultation (Cooper and Mira, 1998) and that of standardised patients and real patients (Tamblyn et al., 1994). This showed that a positive relationship existed between standardised patients, teachers, and real patients. The only difference was what was considered to be important to teachers was different to what was considered to be important to standardised patients. Given the fact

undergraduate students receive similar training to teachers; it could be possible that what was considered important to them was different than what was considered important to the parents.

It was not possible to use parent satisfaction as the gold standard for the consultation owing to the very poor correlation between it and the PCAT scale.

4.3 Problems encountered

The study encountered several difficulties:

1) Ethical approvals:

The study was delayed as a result of the ethics processes required. Initially it was thought that the approval of National Research Ethics Service (NRES) and Leeds Research and Development Directorate (R&D) would be sufficient. During the transfer viva, it was recommended to obtain ethical approval from the Educational Research Ethics Committee (EDREC) at the University of Leeds in addition to NRES and R&D approvals. Therefore, the approval of EDREC was sought after obtaining approval of NRES and R&D. Their approval was contingent on some substantial amendments, which were applied. The substantial amendments were then submitted to NRES and R&D for final approval.

The delay in the start date of the study affected the study negatively, as there was less time available to recruit participants.

2) Participants:

a) Recruitment: initially the students refused participation in the study as they were nervous about being videotaped. The study required several participants for each session to consent, which was at times difficult to achieve. The children and their parents were already pre assigned to the students. In some cases the parent agreed to participate but the consulting dentist might not or vice-versa. Also, the parent, child, and consulting dentist might agree, but the peer observer might not be available as all students might have had a patient or they might have refused to participate. Furthermore, the number of new patients per clinic was limited which further complicated the recruitment of participants. Finally, undergraduate students could only have participated in the study once as either a consulting dentist or peer observer and therefore, as the study progressed there were less potential students' participants.

3) Technical problems:

The videos of the consultations were stored on the servers of the Medical and Dental Illustration Department. The videos were of a large file size and this led to overloading of the server on which the data was stored. The retrieval of the videos was a slow process and often required technical assistance. This was provided by the staff of the Medical and Dental Illustration Department, but they were not always available, which led to further delay.

4) Design problems:

Initially it was intended to test the inter-rater reliability of the PCAT scale during the training period. Due to poor cooperation students were paired in small groups to encourage participation. Therefore, it was not possible to test the inter-rater reliability of the PCAT at the early stages of the study.

4.4 Suggestions for further research

The current study showed that the undergraduate students strongly preferred the use of video over the peer reviews. It would be interesting to assess the students' preference in the early stages of the dental curriculum and toward the end of their curriculum to see if their preference changes. Another point to consider is the person giving the feedback; Would the students opinion change if they receive verbal feedback from a staff member?

Further studies are needed to assess if the video review provides a representation of the parent and child's opinion of the consultation. Currently there are no reliable scales to measure the satisfaction of the parent and the child toward the dental consultation simultaneously but separately. Therefore, it would be beneficial to develop and assess the validity and reliability of such scale.

Also, it might be useful to further examine the inter- and intra -rater reliability between the peer observers and the consulting dentists and assess which represents the parental/child opinion. This study can be used in future research to obtain power calculations. However a scale with inter and intra-rater reliability

is needed to measure the paediatric dentistry consultation. The PCAT scale showed promise to be used in an informative manner but it needs further development to be used in a summative assessment.

5.0 Conclusion.

Undergraduate dental students at Leeds Dental Institute preferred the video review over the peer review. Video review provided benefits in the form of an objective evaluation, acted as a permanent record, and offered clinical application of theoretical learning. Conversely, the students were concerned about the effect the video recording might have on the quality of the consultation.

There was little correlation between the parental satisfaction and the undergraduates' opinion of the consultation. Also, there was poor agreement between the undergraduate students' opinion of the consultation as either inter or intra reliability using the PCAT scale. However, the PCAT scale was liked by the students as it gave them an insight into how to structure a patient's consultation in the paediatric dentistry setting.

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7.0 Appendices

7.1 Ethical approval:

7.1.1 Appendix1: NRES approval.



Health Research Authority

NRES Committee Yorkshire & The Humber - Leeds East

Yorkshire and Humber REC Office
First Floor, Millside
Mill Pond Lane
Meanwood
Leeds
LS6 4RA

Telephone: 0113 3050108
Facsimile:

29 June 2012

Dr Mona Alomairah
Post graduate student
Leeds Dental Institute,
University of Leeds.
Clarendon Way
LS2 9LU

Dear Dr Alomairah

Study title: Videotape review versus peer review for evaluating communication skills used by undergraduate Dental student's during a child's initial dental consultation
REC reference: 12/YH/0261
Protocol number: N/A

Thank you for your letter of 25 June 2012, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Ethical review of research sites

NHS sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Non-NHS sites

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to

A Research Ethics Committee established by the Health Research Authority

the start of the study at the site concerned.

Management permission ("R&D approval") should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.

Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at <http://www.rdforum.nhs.uk>.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of approvals from host organisations

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

| Document | Version | Date |
|---|---------|-------------------|
| Evidence of insurance or indemnity | | 28 September 2011 |
| Investigator CV | | 08 May 2012 |
| Other: CV - Academic Supervisor | | 08 May 2012 |
| Other: Assent for older children | | 08 May 2012 |
| Other: PCAT | | |
| Other: Qualitative Questionnaire for students | | |
| Other: Invitation to parent | 2 | 25 June 2012 |
| Participant Consent Form: Students Consent Form | | 08 May 2012 |
| Participant Consent Form: Parents Consent Form | | 08 May 2012 |
| Participant Information Sheet: Patient Information Sheet 9-11 years | 1 | 01 January 2012 |
| Participant Information Sheet: Children Information Sheet 5-8 years | | 08 May 2012 |
| Participant Information Sheet: Student Information Sheet | 2 | 25 June 2012 |
| Participant Information Sheet: Parent Information Sheet | 2 | 25 June 2012 |
| Protocol | 2 | 25 June 2012 |
| Questionnaire: Parents questionnaire | | |
| REC application | | 02 May 2012 |
| Response to Request for Further Information | | 25 June 2012 |

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Reporting requirements

The attached document "*After ethical review – guidance for researchers*" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

Feedback

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

Further information is available at National Research Ethics Service website > After Review

| | |
|------------|--|
| 12/YH/0261 | Please quote this number on all correspondence |
|------------|--|

With the Committee's best wishes for the success of this project

Yours sincerely



PP
Dr Carol Chu
Chair

Email: jade.thorpe@nhs.net

Enclosures: "After ethical review – guidance for researchers"

Copy to: Mrs Rachel Desouza
Ann Gowing, Leeds Teaching Hospital NHS Trust/ Research and
Development

7.1.2 Appendix 2: R&D approval.

The Leeds Teaching Hospitals 

NHS Trust

Ref: Josephine Dominic

12/07/2012

Dr Mona Alomairah
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Dear Dr Mona Alomairah

Re: NHS Permission at LTHT for: Videotape review versus peer review for evaluating communication skills used by undergraduate Dental student's during a child's initial dental consultation
LTHT R&D Number: DT12/10330
REC: 12/YH/0261

I confirm that *NHS Permission for research* has been granted for this project at The Leeds Teaching Hospitals NHS Trust (LTHT). NHS Permission is granted based on the information provided in the documents listed below. All amendments (including changes to the research team) must be submitted in accordance with guidance in IRAS. Any change to the status of the project must be notified to the R&D Department.

Permission is granted on the understanding that the study is conducted in accordance with the *Research Governance Framework for Health and Social Care*, ICH GCP (if applicable) and NHS Trust policies and procedures available at [http://www.leedsth.nhs.uk/sites/research and development/](http://www.leedsth.nhs.uk/sites/research%20and%20development/).

This permission is granted only on the understanding that you comply with the requirements of the *Framework* as listed in the attached sheet "Conditions of Approval".

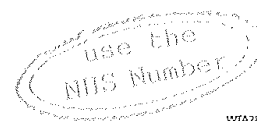
If you have any queries about this approval please do not hesitate to contact the R&D Department on telephone 0113 392 2878.

Indemnity Arrangements

The Leeds Teaching Hospitals NHS Trust participates in the NHS risk pooling scheme administered by the NHS Litigation Authority 'Clinical Negligence Scheme

Chairman Mike Collier CBE Chief Executive Maggie Boyle

The Leeds Teaching Hospitals incorporating:
Chapel Allerton Hospital Leeds Dental Institute Seacroft Hospital
St James's University Hospital The General Infirmary at Leeds Wharfedale Hospital




WTA280

for NHS Trusts' for: (i) medical professional and/or medical malpractice liability; and (ii) general liability. NHS Indemnity for negligent harm is extended to researchers with an employment contract (substantive or honorary) with the Trust. The Trust only accepts liability for research activity that has been managerially approved by the R&D Department.

The Trust therefore accepts liability for the above research project and extends indemnity for negligent harm to cover you as investigator and the researchers listed on the Site Specific Information form. Should there be any changes to the research team please ensure that you inform the R&D Department and that s/he obtains an appropriate contract, or letter of access, with the Trust if required.

Yours sincerely



Dr D R Norfolk
Associate Director of R&D

Approved documents

The documents reviewed and approved are listed as follows

| <i>Document</i> | <i>Version</i> | <i>Date of document</i> |
|---|----------------|-------------------------|
| NHS R&D Form | 3.4 | 01/05/12 |
| SSI Form | 3.4 | 03/07/12 |
| Supervisor Signature | | 08/05/12 02/05/12 |
| REC Letter confirming favourable opinion | | 29/06/12 |
| Protocol | 2 | 25/06/12 |
| Patient information sheet (REC approved) – students | 2 | 25/06/12 |
| Consent form (REC approved) – students | 2 | 25/06/12 |
| Patient information sheet (REC approved) – parents | 2 | 25/06/12 |
| Consent form (REC approved) – parents | 2 | 25/06/12 |
| Letter of invitation | 2 | 25/06/12 |
| Questionnaire – Student & Parent | | 08/05/12 |
| Assent for older children | | 08/05/12 |
| PCAT | | |
| PIS 9-11yrs | 1 | 08/05/12 |
| PIS 5-8 yrs | 1 | 08/05/12 |

Conditions of NHS Permission for Research:

- Permission from your Directorate must be obtained before starting the study.
- Favourable Opinion of the appropriate Research Ethics Committee, where necessary, must be obtained before starting the study.
- Arrangements must be made to ensure that all members of the research team, where applicable, have appropriate employment contracts or letter of agreement to carry out their work in the Trust.
- Agreements must be in place with appropriate support departments regarding the services required to undertake the project and arrangements must be in place to recompense them for the costs of their services.
- Arrangements must be in place for the management of financial and other resources provided for the study, including intellectual property arising from the work.
- Priority should be given at all times to the dignity, rights, safety and well being of participants in the study
- Healthcare staff should be suitably informed about the research their patients are taking part in and information specifically relevant to their care arising from the study should be communicated promptly.
- Each member of the research team must be qualified by education, training and experience to discharge his/her role in the study. Students and new researchers must have adequate supervision, support and training.
- The research must follow the protocol approved by the relevant research ethics committee. Any proposed amendments to or deviations from the protocol must be submitted for review by the Research Ethics Committee, the Research Sponsor, regulatory authority and any other appropriate body. The R&D Department should be informed where the amendment has resource implications within the Directorate and the Directorate research lead/clinical director notified.
- Adverse Events in clinical trials of investigational medicinal products must be reported in accordance with the Medicines for Human Use (Clinical Trials) Regulations 2004.
- Complete and return Study Status Reports, when requested, to the R&D Department within 28 days of receipt as requested. (NB Failure to comply to such request with the requirement will lead to suspension of NHS Permission.)
- Procedures should be in place to ensure collection of high quality, accurate data and the integrity and confidentiality of data during processing and storage.

- Arrangements must be made for the appropriate archiving of data when the research has finished. Records must normally be kept for 15 years.
- All data and documentation associated with the study must be available for audit at the request of the appropriate auditing authority. Projects are randomly selected for audit by the R&D Department. You will be informed by letter if your study is selected.
- Findings from the study should be disseminated promptly and fed back as agreed to research participants.
- Findings from the study should be exposed to critical review through accepted scientific and professional channels.
- All members of the research team must ensure that the process of informed consent adheres to the standards GCP outlined in the UK Clinical Trials Regulations. Investigators are directed to the R&D website for further information and training availability.
- Where applicable, this NHS Permission includes aspects of the study previously covered by the NRES Site Specific Assessment (SSA) process.
- Appropriate permissions must be in place for studies which are covered by the Human Tissue Act.
- Patient Information Sheet and Consent form must be on The Leeds Teaching Hospitals headed paper and include local contact details.

Commercially Sponsored Trials

If the study is commercially sponsored, NHS Permission is given subject to provision of the following documents.

- Clinical Trials Agreement - agreed and signed off by the R&D Department (on behalf of the Leeds Teaching Hospitals NHS Trust) and the Sponsor. Investigators do not have the authority to sign contract on behalf of the Trust.
- Indemnity agreement, if not included in the Clinical Trials Agreement- (standard ABPI no fault arrangements apply) signed by the R&D Department and the Sponsor

It is essential that all the responsibilities set out in the Research Governance Framework, including those outlined above are fulfilled. The Trust reserves the right to withdraw NHS Permission where the above criteria are not being met. The Trust will not accept liability for any activity where NHS Permission has not been granted.

7.1.3 Appendix 3: EDREC approval.

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UNIVERSITY OF LEEDS

Dr Mona Alomairah
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04 October 2012

Dear Mona

Ref no: EDREC/11/042

Title: Videotape review versus peer review for evaluating communication skills used by undergraduate dental students during a child's initial dental consultation

I am pleased to inform you that the above research application has been reviewed by the Medicine and Dentistry Educational Research Ethics Committee (EdREC) and I can confirm a favourable ethical opinion based on the documentation received at date of this letter.

| <i>Document</i> | <i>Version</i> | <i>Date</i> |
|-------------------------------|----------------|-------------|
| Edrec Application | 1 | 11.07.12 |
| Protocolv | 1 | 11.07.12 |
| Ethical responsefavrable | 1 | 11.07.12 |
| Paulburtonletter | 1 | 11.07.12 |
| Peterdaycv | 1 | 11.07.12 |
| monaalomairahcv | 1 | 11.07.12 |
| Parentsquestinnair | 1 | 11.07.12 |
| Parentinfo | 1 | 11.07.12 |
| Parent invitation | 1 | 11.07.12 |
| Parent consent | 1 | 11.07.12 |
| Infosheet9-11 | 1 | 11.07.12 |
| Assent young children | 1 | 11.07.12 |
| studentinfo | 1 | 11.07.12 |
| Student consent | 1 | 11.07.12 |
| Storyboard info | 1 | 11.07.12 |
| Storyboard form | 1 | 11.07.12 |
| PCAT | 1 | 11.07.12 |
| QualitativeQ | 1 | 11.07.12 |
| Protocolv | 2 | 17.09.12 |
| Reviewer1 comments(response) | 1 | 17.09.12 |
| Reviewer2 comments (response) | 1 | 17.09.12 |

Please notify the committee if you intend to make any amendments to the original research as submitted at date of this approval. This includes recruitment methodology and all changes must be ethically approved prior to implementation. Please contact the Faculty Research Ethics and Governance Administrator for further information (fmhuniethics@leeds.ac.uk)

Ethical approval does not infer you have the right of access to any member of staff or student or documents and the premises of the University of Leeds. Nor does it imply any right of access to the premises of any other organisation, including clinical areas. The committee takes no responsibility for you gaining access to staff, students and/or premises prior to, during or following your research activities.

Please note: You are expected to keep a record of all your approved documentation, as well as documents such as sample consent forms, and other documents relating to the study. This should be kept in your study file, which should be readily available for audit purposes. You will be given a two week notice period if your project is to be audited.

It is our policy to remind everyone that it is your responsibility to comply with Health and Safety, Data Protection and any other legal and/or professional guidelines there may be.

I wish you every success with the project.

Yours sincerely

A handwritten signature in black ink, appearing to be 'J. Sandars', written in a cursive style.

Dr John Sandars
Chair, EdREC

7.1.4 Appendix 4: NRES approval of amendments.



Health Research Authority

NRES Committee Yorkshire & The Humber - Leeds East
Yorkshire and Humber REC Office
First Floor, Millside
Mill Pond Lane
Meanwood
Leeds
LS6 4RA

Tel: 0113 3050174
Fax: 0113 8556191

01 November 2012

Dr Mona Alomairah
Post graduate student
University of Leeds
Leeds Dental Institute, University of Leeds.
Clarendon Way
LS2 9LU

Dear Dr Alomairah,

Study title: Videotape review versus peer review for evaluating communication skills used by undergraduate Dental student's during a child's initial dental consultation
REC reference: 12/YH/0261
Protocol number: N/A
Amendment number: 1
Amendment date: 10 October 2012

The above amendment was reviewed by the Sub-Committee held on 01 November 2012 by correspondence.

Ethical opinion

The subcommittee reviewed the amendment and found no ethical issues.

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

Approved documents

The documents reviewed and approved at the meeting were:

| Document | Version | Date |
|---|---------|-------------------|
| Qualitative questionnaire for students | 2 | 11 September 2012 |
| Invitation to Participate in a research study | 3 | 11 September 2012 |
| Participant Information Sheet: 9-11years | 2 | 11 September 2012 |
| Notice of Substantial Amendment (non-CTIMPs) | | 10 October 2012 |

A Research Ethics Committee established by the Health Research Authority

| | | |
|-----------------|---|-------------------|
| Covering Letter | | 17 October 2012 |
| Protocol | 3 | 11 September 2012 |

Membership of the Committee

The members of the Committee who took part in the review are listed on the attached sheet.

R&D approval

All investigators and research collaborators in the NHS should notify the R&D office for the relevant NHS care organisation of this amendment and check whether it affects R&D approval of the research.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

| | |
|--------------------|---|
| 12/YH/0261: | Please quote this number on all correspondence |
|--------------------|---|

Yours sincerely



pp

Dr C E Chu
Chair

E-mail: nrescommittee.yorkandhumber-leedseast@nhs.net

Enclosures: List of names and professions of members who took part in the review

*Copy to: Mrs Anne Gowing, Leeds Teaching Hospitals NHS Trust
Mrs Rachel Desouza*

NRES Committee Yorkshire & The Humber - Leeds East

Attendance at Sub-Committee of the REC meeting on 01 November 2012

Also in attendance:

| <i>Name</i> | <i>Position (or reason for attending)</i> |
|------------------|---|
| Prof Alan Ebbutt | Statistician |
| Mr Roly Squire | Consultant Paediatric Surgeon |

7.1.5 Appendix 5: R&D approval of amendments.

The Leeds Teaching Hospitals 
NHS Trust

Ref: Amanda Burd

07/11/2012

Research & Development Directorate

Dr Mona Alomairah
Leeds Dental Institute,
Clarendon Way
LS2 9LU

34 Hyde Terrace
Leeds
LS2 9LN

Tel: 0113 392 2878
Fax: 0113 392 6397

www.leedsth.nhs.uk/sites/research_and_development

Dear Dr Mona Alomairah

**Re: LTHT R&D Number: DT12/10330 Videotape review versus peer review for evaluating communication skills used by undergraduate Dental students during a child's initial dental consultation
REC: 12/YH/0261**

Thank you for your E mail dated 05/11/2012 regarding amendment 1 to the above research study.

The amendment may be implemented with immediate effect in the Leeds Teaching Hospitals NHS Trust under the existing NHS Permission. Please note that you may only implement the changes described in the amendment notice or letter

Continued NHS Permission for the project is subject to the following conditions:

- Research Ethics Committee approval/regulatory approval for the amendment, if required, has been obtained
- Any contractual arrangements relating to this change have been addressed
- The Research Lead/Clinical Director for the Directorate has approved any resource implications for the Directorate

If you have any queries about this acknowledgement please do not hesitate to contact the R&D Department on (0113) 392 2878.

With kind regards

Yours sincerely


Dr. D R Norfolk
Associate Director of R&D

The documents reviewed and approved are listed as follows

| <i>Document</i> | <i>Version</i> | <i>Date of document</i> |
|---|----------------|-------------------------|
| MREC Approval Letter | AMD 1 | 01/11/2012 |
| Qualitative Questionnaire for Students | 2 | 11/09/2012 |
| Invitation to Participate in a Research Study | 3 | 11/09/2012 |
| Participant Information Sheet – 9 to 11 yrs | 2 | 11/09/2012 |
| Notice of Substantial Amendment Form | | 10/10/2012 |
| Cover Letter | | 17/10/2012 |
| Protocol | 3 | 11/09/2012 |

7.2 Participants' information sheet and consent form.

7.2.1 Appendix 6: Students' information sheet.

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STUDENTS' INFORMATION SHEET (V2)

25/6/2012

Study Title:

Videotape review versus peer review for evaluating communication skills used by undergraduate dental students during a child's initial dental consultation.

Introduction:

You are invited to take part in the above research study organised by the Department of Paediatric Dentistry at Leeds Dental Institute.

Before you decide whether or not to take part, please take time to read the following information carefully in order to understand what this research is about and what your participation involves. Please feel free to discuss with other people and ask us if you wish to clarify any matters regarding this research.

Research Purpose:

The purpose of this study is to see if videotaping dental visits will help future dentist talk and communicate to their child patient and their parents in a better way.

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Questions You May Have

Why have I been chosen?

We are inviting you, as a third-year dental student, because you just started seeing patients in the Paediatric clinic.

Do I have to take part?

You are not obliged to participate. We will go through this information sheet and explain this study to you. If you decide to take part, you will be required to sign a consent form, although you are free to withdraw from the study at any time without giving a reason. This will not affect you in any way.

What do I have to do?

You will already attend a clinic introductory session to the paediatric department as part of your undergraduate curriculum; this will take approximately two hours. For this research you will also need to stay for another hour with the researcher which will be in addition to your undergraduate curriculum. At this point the research project will be explained to you and a tutorial on communication skills and grading of these will be discussed.

You will be assigned randomly as either observing a dentist or consulting dentist. The consulting dentist will conduct the first consultation for the child attending the undergraduate paediatric dentistry clinic; the observing dentist will observe the consultation and will record their observation of the consultation using a Paediatric Consultation Assessment Tool (PCAT). Following the consultation, the consulting dentist will be asked to fill in the PCAT to critique their performance during the consultation.

The consultation will be videotaped by the researcher. After one week, the observer and consulting dentist will review the video consultation again in a private setting. Each will be asked to fill in the PCAT in again whilst observing the video. The observing dentist

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and consultant dentist will be asked to fill in a qualitative questionnaire exploring how they felt they benefited from the peer and videotape feedback in terms of their communication skills. At the end, the researcher (MA)—who is a postgraduate student in paediatric dentistry—will discuss the communication skills used and areas for improvement concerning both the consulting and observing dentist.

In case a consulting error is recognised on video this will be identified with the clinical demonstrator and appropriate action will be taken to ensure patient safety.

What are the possible benefits of taking part?

By participating in this study as either the consulting or observing dentist, you will receive detailed feedback and advice on how to improve your communication skills with parents and children during consultation visits in paediatric dentistry. The long-term benefits would include contributions to literature and providing insight in regard to how dental education can be improved.

What will happen if I decide not to continue with the study?

You can withdraw from the study at any time. This will not affect your education experience or the opportunities you receive whilst undertaking your clinical paediatric dentistry module. Unless expressly stated by you, we would still intend to use the information collected up to the time of your withdrawal.

What will happen to the results of the research?

The results of this study will be used for a professional doctorate research project by Mona Alomairah and will be published in Dental Journals and presented at dental conferences. There will be no mention to specific individuals taking part in the study and no personal data will be published.

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Who is organising and funding this research?

The University of Leeds is funding the research.

Who reviewed this study?

The national health services (NHS) ethics committee have reviewed the study.

Who can I contact for further information?

If you have further questions, you can contact Mrs M. Alomairah or the lead supervisor, Dr Peter Day, through the following methods:

Mrs M. Alomairah:

Email: dmal@leeds.ac.uk

Telephone: 07583 763623

Dr Peter Day:

Email: p.f.day@leeds.ac.uk

Tel: 01133 436139

You can visit "INVOLVE" web site to have independent advice about taking part in research. (http://www.invo.org.uk/About_Us.asp)

7.2.2 Appendix 7: Students' consent form.

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STUDENTS' CONSENT FORM (V2)

08/5/2012

Patient Identification Number/Name:

Initial the box if you agree with the statement to the left.

- 1 I confirm that I have read and understand the information sheet/letter(V2) explaining the above research project and I have had the opportunity to ask questions about the project.
- 2 I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason and without there being any negative consequences. In addition, should I not wish to answer any particular question or questions, I am free to decline.
- 3 I give permission for members of the research team to have access to my anonymised responses. I understand that my name will not be linked with the research materials, and I will not be identified or identifiable in the report or reports that result from the research.
- 4 I agree for the data collected from me to be used in future research and for educating dentist and the dental team.
- 5 I agree to take part in the above research project.

Name of participant

Date

Signature

(Or legal representative)

Lead researcher

Date

Signature

To be signed and dated in presence of the participant

Copies:

Once this has been signed by all parties the participant should receive a copy of the signed and dated participant consent form, the letter/pre-written script/information sheet and any other written information provided to the participants. A copy of the signed and dated consent form should be kept with the project's main documents which must be kept in a secure location.

7.2.3 Appendix 8: Parents' information form.

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PARENT'S INFORMATION SHEET (V2)

25/6/2012

Research Title

Videotape review versus peer review for evaluating communication skills used by undergraduate dental students during a child's initial dental consultation.

Introduction

You and your child are invited to take part in the above research study at Leeds Dental Institute.

Before you decide whether or not to take part, please take time to read the following information carefully in order to understand what this research is about and what your participation involves. Please feel free to discuss with other people and ask us if you wish to clarify any matters regarding this research. Taking part in the study will approximately add 15–20 minutes to your appointment.

Study Purpose

The purpose of this study is to determine whether videotaping dental visits will help future dentists talk to you and your child in a better way.

Some Questions You May Have

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Why have I been chosen?

You and your child have been chosen because your child is attending their first visit with the Undergraduate Paediatric Dentistry Clinic at Leeds Dental Institute.

Do I have to take part?

You are not obliged to participate. We will go through this information sheet and explain this study to you. If you decide to take part, you will be required to sign a consent form, although you are free to withdraw from the study at any time without giving a reason. This will not affect yours or your child's treatment in any way.

What do I have to do?

Normally there is one qualified dentist to overlook the students' performance during the session.

We would like to videotape your consultation visit with the undergraduate dental student you see. In addition, there will be another undergraduate dental student observing the performance of your undergraduate student. Finally, we would also like to establish your opinions concerning the consultation visit through a parental satisfaction questionnaire. So over all there will be two undergraduate dental students in your consultation session instead of one.

After a week the videotape will be viewed with your undergraduate dental student and observing undergraduate dental student with the objective to review the communication skills your undergraduate student used.

What are the possible benefits of taking part?

Although there are no immediate benefits for those people participating in the project, it is hoped that this work will improve the education of undergraduate dental students and, in turn, will improve the communication skills of future dentists.

What will happen if I decided not to continue with the study?

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You can withdraw from the study at any time; this will not affect your child's treatment in any way. Unless expressed otherwise, we will use the information already collected.

What will happen to the result of the research?

The information will be stored safely and securely in the usual manner that all other clinical data/records are stored. Moreover, the results of this study will be used for professional doctorate research project by Mona Alomairah, and possibly published in Dental Journals and presented at conferences. No personal data will be published and you and your child will not be identified in anyway.

Who is organising and funding this research?

The University of Leeds will be funding the research.

Who reviewed this study?

The national health services (NHS) research ethics committee have reviewed the study.

Who can I contact for further information?

If you have further questions, you can contact Mrs M. Alomairah or the lead supervisor, Dr Peter Day, through the following methods:

Mrs M. Alomairah:

Email: dnmal@leeds.ac.uk

Telephone: 07583 763623

Dr Peter Day:

Email: p.f.day@leeds.ac.uk

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Tel: 01133 436139

You can visit "INVOLVE" web site to have independent advice about taking part in research (http://www.invo.org.uk/About_Us.asp)

7.2.4 Appendix 9: Older children information form.

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PATIENT INFORMATION SHEET (9–11 YEARS) (V2)

11/9//2012

Study Title:

A study to establish whether videotaping the dental visit will help the dentist talk to you in a better way in the future.

Hello my name is Mona and I am the dentist conducting this study. Would you like to help me?

What is research? Why is this project being done?

Research is a way of trying to find out answers to questions. We want to see whether videotaping dental visits will help the future dentist talk to you and communicate with you in a better way.

Why have I been asked to take part?

You have been asked because you're attending an appointment at Leeds Dental Institute and you are between the ages of 5 and 11 years old. A number of other children who visit this clinic will be asked as well.

Do I have to take part?

No, you don't have to take part and no one will mind if you don't.

What will happen to me if I take part in the research?

Your appointment with the dentist will be videotaped and nothing else will happen.

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Might anything about the research upset me?

No, nothing. If you get upset, you just need to inform us and we will stop the videotaping immediately.

Will joining help me?

We cannot promise the study will help you but the information we get might help future dentists talk and communicate in a better way with children.

What if I don't want to do the research anymore?

If you want the video recording to stop, please tell us and we will stop right away.

What if I don't want to do the research anymore?

If you want the video recording to stop, please tell us and we will stop right away.

Who can I contact for further information?

If you have further questions, you can contact Mrs M. Alomairah or the lead supervisor, Dr Peter Day, through the following methods:

Mrs M. Alomairah:

Email: dnmal@leeds.ac.uk

Telephone: 07583 763623

Dr Peter Day:

Email: p.f.day@leeds.ac.uk

Tel: 01133 436139

You can visit "INVOLVE" web site to have independent advice about taking part in research. (http://www.invo.org.uk/About_Us.asp)

Thank you.

7.2.5 Appendix 10: Parents' consent form.

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PARENT CONSENT FORM(V2)

08/5/2012

Patient Identification Number/Name:

Initial the box if you agree with the statement to the left.

- 1 I confirm that I have read and understand the information sheet/letter (V2) explaining the above research project and I have had the opportunity to ask questions about the project.
- 2 I understand that my participation and my child's are voluntary and that we are free to withdraw at any time without giving any reason and without there being any negative consequences. In addition, should we not wish to answer any particular question or questions, we are free to decline.
- 3 I understand that my child's name will not be linked with the research materials, and we will not be identified or identifiable in the report or reports that result from the research.
- 4 I agree for the data collected from our participation can be used in future research and for educating dentist and the dental team.

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5 I and my child agree to take part in the above research project.

| | | |
|---|-------|-----------|
| _____ | _____ | _____ |
| Name of participant | Date | Signature |
| <i>(or legal representative and relationship)</i> | | |

| | | |
|-----------------|-------|-----------|
| _____ | _____ | _____ |
| Lead researcher | Date | Signature |

To be signed and dated in presence of the participant

Copies:

Once this has been signed by all parties the participant should receive a copy of the signed and dated participant consent form, the letter/pre-written script/information sheet and any other written information provided to the participants. A copy of the signed and dated consent form should be kept with the project's main documents which must be kept in a secure location.

7.2.6 Appendix 11: Assent form.

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ASSENT FOR OLDER CHILDREN (V1)

8/5/2012

Patient Identification Number/Name:

Project Title:

Study to determine if videotaping the dental visit will help the dentist talk to you in a better way in the future.

Please *circle* all that you agree with (if you are unable to do so, your parents may help you).

Have you read (or had read to you) about this project (V1)? Yes/No

Has somebody else explained this project to you? Yes/No

Do you understand what this project is about? Yes/No

Have you asked all the questions you want? Yes/No

Do you understand all the answers to your questions? Yes/No

Do you understand it's OK to stop taking part at any time? Yes/No

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UNIVERSITY OF LEEDS

Are you happy to take part?

Yes/No

If any answers are 'No' or you do not want to take part, don't sign your name!

If you do want to take part, you can write your name below

Name (Block Capitals): _____

Child's Signature: _____

Date: _____

Name (Block Capitals): _____

Parent/Guardian Signature: _____

Date: _____

The dentist who explained this project to you needs to sign too:

Name (Block Capitals): _____

Signature: _____

Date: _____

7.2.7 Appendix 12: Story board.

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CHILDREN INFORMATION SHEET (5–8 YEARS) (V1)

8/5/2012



Hi my name is
Mona and I am
a dentist



I would like to
record your visit to
the dentist on a
video.



We will then use the
video to help dental
students with the way
they talk to children.



Can you help me
??

THANKS

7.3 Appendix 13: Camera features and functions.

Features And Function Of Sony HDV 1080i Video Camera.

Features:

- 1/3-inch Type, 2.97-megapixel CMOS Sensor
- The HVR-A1 incorporates one 1/3-inch type primary colour CMOS (Complementary Metal Oxide Semiconductor) sensor with a total pixel number of 2.97 million and a 4:3 aspect ratio. This CMOS sensor can produce high-quality images with high sensitivity and low noise levels.
- Optical 10x Carl Zeiss Vario-Sonnar T Zoom Lens
- Electronic Super SteadyShot System
- Compensates for unsteady camera handling.
- Full Scan Mode
- Allows the camcorder to capture images with the resolution of approximately two million pixels at every zoom position.
- Enhanced Imaging Processor (EIP)
- allows high details in the blacks as well as in brightly illuminated areas of the picture, delivering a clear image with a wide dynamic range even under backlight conditions

FUNCTIONS:

- Simultaneous Operation of LCD Monitor and Viewfinder.
- Expanded Focus - magnifies the center of the screen on the LCD.
- Peaking - enhances the outline of the image where the camera focuses on most, and displays the enhanced outline with color in the LCD monitor and viewfinder, helping manual focusing.
- Zebra - displays a striped pattern in the LCD monitor and viewfinder across highlight areas, helping manual exposure settings (100% or 70 to 100% adjustable by 5% steps).
- Quick REC - shortens the time until the recording starts from stop mode.
- Status Check - displays camera setting menus for audio, output signal, assign button and exposure lever functions and hours meter on the LCD monitor with the touch of a button for easy check.
- Personal Menu - allows operators to customize the setting menu to display frequently used menu items.
- Battery Info - displays the attached battery's current charge level and its current remaining recording time on the LCD monitor with the touch of a button, when the power is turned off.
- Super Night Shot - allows operators to capture images in black and white using a built-in infrared light, even in no light conditions.
- Skin Tone Detail - reduces detailed signal for skin color, smoothening the reproduction of human skin.
- Black Stretch - allows more contrast to be seen in dark parts of the picture without affecting mid-tones while maintaining the absolute black level.
- Color Bar - Two types White Balance - Auto, One Push Auto, Indoor (3200 K), and Outdoor (5800 K)