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Investigation of the Quality of Students' Learning Experience and the Quality of Service Provided in Clinical Dental Education

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The Purpose of the Study

The Faculty of Dentistry understands the significance of its role as a national school of dentistry. It is aware of the importance of maintaining a competitive edge not only at the national level, but at the regional level as well. Quality assurance (QA) is a top priority and has full support from the leadership at the dental school and the administration of the institution.

Clinical training constitutes a major part of the pre-doctoral dental education curriculum. In their clinical training, students perform dental procedures on patients under the supervision of experienced faculty members. In clinical training, teaching and learning intersect with service provision; the factors that affect the quality of the students' learning experiences and the factors that affect the quality of services provided to their patients intertwine.

The current study involves conducting an evaluation of the quality of the learning experience and the quality of the services provided in the teaching clinic operated by pre-doctoral students. The quality assessment was carried out by exploring the views of the main stakeholder groups: the patients, the students and the faculty members, on several quality dimensions.

Findings

Findings show that the patients were generally satisfied with the services they receive and gave high quality ratings. Patients receive dental care provided by the students at no cost and are generally appreciative and satisfied.

Students and faculty members, on the other hand, were not quite satisfied. They have identified some challenges that they believe are negatively affecting the quality of learning and the services offered at the student clinic. The main impediments to quality enhancement that have been identified include:

- Limited resources that hinder the investment in the clinic's physical facilities and educational resources
- Lack of a comprehensive approach to patient care
- Substandard patient management practices

Recommendations

The one recommendation that is believed to substantially improve the quality of clinical training and the quality of services provided at the student clinic is to redesign the clinical instruction to embrace the comprehensive care model. The reasons that this change is believed to be essential for quality enhancement include:

- The comprehensive care model is considered a benchmark best practice in dental clinical instruction. The superiority of the comprehensive care curriculum over the traditional discipline-specific procedural requirements curriculum that is currently implemented is well documented in the literature
- The data show that many of the issues that impede quality improvement in the student clinic are either direct or indirect consequences of the currently implemented discipline-specific procedural

requirements curriculum.

- In fact, there is a genuine concern amongst the faculty members regarding the short-term and the long-term moral and ethical implications of training pre-doctoral students in an environment that is not patient-friendly, where the students' need to make the grade takes precedence over their patients' oral healthcare needs.
- The atmosphere at the clinic is set for the change; the faculty members and the students are ready to embrace the comprehensive care curriculum. The faculty members are convinced that the current curriculum requires revision; it is not as educationally effective or patient-friendly as it could be. The students are convinced that the focus on the procedural requirements is overly stressful and prevents them from concentrating on learning the proper patient care.

Implications

Curriculum change is a long and complex process. Nevertheless, it has been noted that attempts to effectively enhance teaching need to address the system as a whole and not just add "good" components. For successful implementation of the comprehensive care model, changes will have to address the entire organisational structure in the student clinic to foster cooperation among departments and shift towards multi-disciplinary care, which are essential for the timeliness and continuity of patient care.

Fundamental changes required include, but not limited to, changes to the patient selection process, treatment planning process, supervision of clinical work and assessment of students' performance. To achieve that, actions will be required at all levels of responsibility; at the level of the system, the curriculum committee, the deanship/ leadership, the faculty, the students and the patients. Planning the clinic's operations based on the comprehensive care model will result in a better alignment of the different processes because they will all be centred on comprehensive, patient-driven care.

The most important change, however, that must be achieved in order to succeed in implementing a comprehensive care curriculum is not a process change, but rather a paradigm shift; a change in the way faculty members and students perceive their role as oral healthcare providers.

Conclusion

Implementation of a comprehensive care curriculum is a major change that will require the review and change of the day-to-day functioning of the student clinic. Above all, it requires a paradigm shift among faculty, students and patients towards patient-centred comprehensive care. The rewards are worthwhile as this approach is currently considered a benchmark best practice in dental clinical training. Some of the factors that can potentially facilitate the change are the strong leadership support and the readiness to embrace the change.

Finances remain a challenge and the school is encouraged to consider alternative sources of income to continue to cover its operational costs and be able to invest in educational resources and physical facilities.

Abstract

Quality assurance (QA) has become a fact of life in higher education. Institutions engage in QA activities to direct spending to the areas that contribute to quality improvement and present to stakeholders evidence of the effectiveness and quality of their programmes. Dental schools are particularly pressured to demonstrate QA efforts to meet accreditation standards and ensure the quality of patient care.

This study presents a quality assessment conducted at a school of dentistry in a developing country. A mixed methods approach is used to seek input from patients, students and faculty members to evaluate the quality of the clinical teaching offered in the pre-doctoral programme. Students and patients completed service quality assessment surveys that are adapted from the SERVPERF model. A focus group and one-on-one interviews were held to seek input from faculty members.

Analysis of the data shows that the patients are generally more satisfied with the services than the students or faculty. The main issues that have been identified by stakeholders to negatively influence the quality of the learning experience and the quality of services provided are: (1) The expansion of the facilities is disproportionate with the growing numbers of students, (2) lack of comprehensive approach to patient care, and (3) the difficulty in patient recruitment and retention.

The findings of this study will advise the decision makers at the school in their planning for curriculum and process reviews, QA efforts and development plans. The surveys that have been used in this study could be used to routinely collect data on patients' and students' satisfaction; however, further testing of the instruments is advised.

Key words: dental education, quality assessment, clinical teaching curriculum

Abstract (Français)

L'assurance qualité est devenue un fait-de-vie dans les universités. Les institutions d'éducation postsecondaire s'engagent dans les activités d'assurance qualité pour montrer aux intervenants la supériorité de leurs programmes et pour diriger les dépenses aux domaines qui contribuent le plus à l'amélioration de la qualité. Les Écoles de Médecine Dentaire sont particulièrement sous pression de démontrer leurs efforts d'assurance qualité de leurs programmes d'études pour répondre aux normes d'accréditation, d'assurer la qualité des soins dentaire et la sécurité des patients.

Cette étude présente une évaluation de la qualité effectuée dans une école de médecine dentaire dans un pays en développement. Des méthodes mixtes servent à collectionner les données des patients, des étudiants et des membres du corps professoral à fin d'évaluer la qualité d'enseignement clinique offert dans le programmes pré-doctorat. Les étudiants et les patients ont été demandés de répondre aux questionnaires d'évaluation de la qualité de service qui sont adaptées en suivant du modèle SERVPERF. Pour collectionner les données et les commentaires des professeurs, ils étaient invités à participer dans un groupe de discussions ou des entrevues individuelles.

L'analyse des données montre que les patients sont généralement plus satisfaits avec les services dentaires offerts que les étudiants ou les professeurs. Les principaux problèmes qui ont été identifiés d'influencer négativement la qualité de l'expérience d'apprentissage des étudiantes et la qualité des services offerts aux patientes sont les suivants: (1) L'élargissement des installations est disproportionné par rapport au nombre croissant d'étudiants, (2) le manque d'approche compréhensive des soins aux patients (3) et les difficultés de recrutement et de rétention des patients.

Les résultats de cette recherche informeront l'administration de l'Écoles de Médecine Dentaire au sujet de leurs efforts d'assurance qualité, la planification de programmes, la revue des processus, et leurs plans de développement. Les questionnaires qui ont été utilisés dans cette étude peuvent être utilisés régulièrement pour évaluer la satisfaction des patients et des étudiants. Toutefois, plus des tests de ses efficacités sont recommandés.

Mots clés: éducation de médecine dentaire, évaluation de la qualité, programmes d'enseignement clinique

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1. Introduction

Higher education institutions face increased pressure to deliver quality programmes with ever-shrinking budgets and ever-increasing competition and accountability. Quality assurance (QA) aims to ensure that quality is not compromised by budget cuts and increased demands; on the contrary, that the quality is actually enhanced by directing efforts and spending on programmes and services that serve to improve teaching and learning and to satisfy stakeholders. Dental schools are particularly pressured to demonstrate quality assurance efforts to meet accreditation standards and to ensure the quality of patient care and safety (Fredekind, Cuny & Nadershahi, 2002).

Clinical training constitutes a major part of the pre-doctoral dental education curriculum. In their clinical training, students perform dental procedures on patients under the supervision of experienced faculty members. The quality of the clinical training is assessed by measuring the impact of the educational programme on the development of the students' knowledge base and the improvement in the patient care they provide. In clinical training, teaching and learning intersect with service provision. The factors that affect the quality of the students' learning experiences and the factors that affect the quality of services provided to their patients intertwine.

Harvey and Knight (1996) view education as a participative process in which an on-going transformation enhances and empowers participants. Effective education is student-centred. It enhances students' knowledge and skills and expands their capabilities. It also empowers students to take ownership of their learning, increases their confidence and awareness and develops their critical thinking abilities. Dental clinical teaching, however, includes an additional element: the patient. Effective clinical teaching is not just student-centred; it is also patient-centred. That is, the needs of the patient must be taken into account and responded to in order to ensure the patient's satisfaction.

Dental education programmes are very expensive to deliver, with the highest cost invested in the clinical teaching programme (Bailit, Beazoglou, Formicola, Tedesco, Brown & Weaver, 2008; Formicola, Bailit, Beazoglou & Tedesco, 2005; Ismail, 1999; Matthew, Walton, Dumaresq & Sudmant, 2006). Teaching clinics, with students as the primary providers of care, do not produce sufficient funds to cover the operational costs and must be heavily subsidized. Decrease in the governmental funding of state-supported dental schools negatively affects the schools' operations in terms of staffing, investment in physical facilities and educational resources (Bailit et al., 2008; Formicola at al., 2005). The limited resources can affect the quality of teaching and learning and the ability of the dental school to fulfil its mission in education and care provision.

This study was conducted at the school of dentistry in a national university located at the heart of the capital city of a developing country. The dental school offers a pre-doctoral clinical training programme at the university hospital. The school has made plans to expand its facilities in order to accommodate the growing number of students admitted every year. The expansion plans include the establishment of a new teaching clinic to increase the number of dental units operated by students. Furthermore, they have recently installed a computer-based electronic patient record (EPR) system and are currently pilot testing its effectiveness in improving the patient management practices at the student clinic. In addition to these developmental plans, the school is engaged in reviewing their internal QA processes and is seeking accreditation by the Association of Dental Education in Europe (ADEE).

The current study involves a quality assessment of the clinical teaching programme at the pre-doctoral level. The quality assessment aims to develop an understanding of the quality issues that students, faculty members and patients are currently facing in clinical training at the student clinic. Patients are asked to assess the quality of services they receive; students are asked to assess the quality of learning they experience and the services they provide to patients; and faculty members are asked to identify the main issues that affect the quality of the teaching and learning activities they facilitate. By seeking quality assessment from the different stakeholders involved in the process we can develop an understanding of the quality issues from the perspective of each group.

Different dimensions of service quality are assessed, including: *tangibles*, which refer to the appearance of physical installations, facilities, equipment, personnel and communication materials in the surrounding environment where services are provided, *faculty members' responsiveness and empathy*, *support staff's responsiveness and empathy*, *patient management practices*, *treatment planning practices*, *students' professionalism*, as well as the *general perception of quality*. The study uses a mixed methods approach in which qualitative and quantitative data are collected and analysed.

The findings from this assessment will provide guidance to the decision makers at the institution in their planning for curriculum and process reviews. They will also inform decision makers in their development efforts to ensure that resources are invested in areas that will have the most desired impact of their educational programmes and the improvement of the services provided to patients.

Later in this document (Sections 3-5), the context, methodology, results and conclusions of this investigation will be discussed. In the following section (Section 2), a review of the relevant literature is presented covering the notion of quality in higher education in general and in dental education in particular, and the common practices in quality assurance and assessment.

2. Literature Review

2.1. Quality in Higher Education

Higher education plays a vital role in driving economic growth and social cohesion in modern societies. The quality of higher education (HE) determines the quality of human resources in a country and contributes to the national development (Sanjaya, 2006). In the last decades, several forces affected the HE sector and caused greater interest in quality and quality assurance (QA) (Brookes & Becket, 2007; Sanjaya, 2006).

Higher education institutions (HEIs) worldwide have been experiencing increased level of enrolment caused by mass education, accompanied by a proliferation of state-supported and for-profit private HEIs and a reduction in government funding (Santiago, Tremblay, Basri and Arnal, 2008). The HE sector is rapidly evolving into an international venture through globalization, the growing international competition and rapid changes in technology (Brookes & Becket, 2007; Johnston, 1996; Little & Williams, 2010; Santiago et al., 2008). As an example, during the past four decades the expansion of the higher education sector in this developing country with a local population smaller that Toronto's, is manifested by the establishment of 13 state-supported universities, and 19 private HEIs. These HEIs compete to attract national students as well as international students within the region.

With the global inclination towards knowledge-driven economies and societies, providing quality HE that fosters life-long learning and enhances individuals' performance to become effective participants in their societies became essential to ensure economic growth and prosperity (Santiago et al., 2008). Nevertheless, widened access to HE has been accompanied by less strict admission requirements, which increased the diversity of the student population in today's universities in terms of student ability, motivation and cultural background (Biggs, 2003). Fink (2003) presents evidence to support the claims often expressed by faculty, students and the general public that graduate students exhibit a shortage in general knowledge and lack the ability to exercise complex thinking and reasoning; so much that some fear this has diminished the elitist nature of HEIs (Lomas, 2002). HEIs, therefore, face increased pressure to deliver quality programmes with ever-shrinking budgets and ever-increasing competition and accountability. QA has become an important topic on the HEIs' agendas as they need to demonstrate to stakeholders that they are able to continue providing quality higher education that is centred on studies at high levels of intensity and complexity and is marked by high selectivity, high standards and staff-student ratios that allow close student-teacher relations (Trow, 1987).

Sanjaya (2006) lists the following reasons why HEIs pursue quality improvement: competition, customer satisfaction, maintaining standards, accountability, credibility, prestige and status, and image and visibility. Sallis (2002) names the four quality imperatives that drive quality practices in HEIs: the moral imperative, the professional imperative, the competitive imperative and the accountability

imperative. However, it is generally agreed that accountability and financial efficiency are the main drivers of quality in HEIs (Brookes and Becket, 2007). "Quality has become a fact of life in higher education (Rozsnyai, 2010, pp. 77);" "…an everyday matter; a self-evident good that everybody wants" (Saarinen, 2010, pp. 55-56).

2.1.1. Quality in Dental Education

Dental schools provide comprehensive programmes of professional education that are expected to play an important role in the advancement of oral health through improving knowledge, prevention of oral disease and promoting attention to oral health in general.

Around the turn of the century, dental education worldwide has been facing some peculiar challenges. The cost of dental education has risen sharply without a parallel increase in governmental funding; on the contrary, the latter has sometimes been reduced (Formicola et al. 2005; Matthew et al., 2006). This has negatively affected the schools' operations in terms of staffing and investment in physical facilities and educational resources (Bailit et al., 2008; Formicola et al. 2005). It is becoming more difficult for dental schools to recruit and retain qualified clinical faculty because the community practitioners' income grows two times faster than that of the faculty. Most dental schools are not able to invest in their physical facilities or other infrastructure areas. In addition, The IOM report *Dental education at the crossroads, challenges and change*, concluded that patient care in dental school clinics is not patient-centred (Field, 1995).

Recognizing all these challenges, the dental organizations -the Institute of Medicine (IOM), the American Dental Education Association (ADEA) and the Macy Foundation- have called for educational reform and innovation in dental education (Bean, Rowland, Soller, Casamassimo, Van Sickle, Levings et al., 2007) in order for dental schools to continue to fulfil their educational and patient care missions.

2.2. Definition of Quality

Quality is an elusive term; it means different things to different people. It is difficult to define quality because it is intangible; people usually do not react to quality, but react to the absence or scarcity of quality (Sallis, 2002). Definitions of quality have been proposed by pioneers in the field. Crosby (1984) defines quality as "conforming to requirements, zero defects," i.e. doing it right the first time and every time. For Juran (1989), quality is "fitness for use," a definition that had wide acceptance in the UK higher education sector. In HEIs, fitness for use usually refers to the ability of the institution to provide educational environments which effectively enable students to achieve worthwhile learning goals (Yorke, 1999). Deming (1982) defines quality as "surpassing customer needs and expectations;" and the objective of quality is to aim for "customer delight" (Sallis, 2002).

Harvey and Green (1993) provide five interpretations of the concept of quality:

- Quality as exceptional: This is the traditional notion in which quality is to exceed standards.

- Quality as perfection or consistency: This is focused on the process, where the aim is to conform to specifications and reduce variation; quality is "zero defects." This concept is not compatible with the views on effective educational processes that see mistakes as opportunities for learning.
- Quality as fitness for purpose: Quality is achieved by meeting requirements, customer satisfaction and mission fulfilment.
- Quality as value for money: This is a market view of quality that is linked to accountability, whereby the HEIs must provide evidence of quality (efficiency and effectiveness of its programmes) to the funding bodies.
- Quality as transformation: Quality is enhancement, added value and empowerment of participants. This is the view that is of interest in higher education.

The Global University Network for Innovation report (GUNI, 2009) listed ten definitions of quality in HE: providing excellence, being exceptional, providing value for money, conforming to specifications, getting things right the first time, meeting customers' needs, having zero defects, providing added value, exhibiting fitness of purpose (relevance), and exhibiting fitness for purpose (GUNI, 2009, pp. 153).

"Fitness for purpose" and "transformation" are the two definitions of quality accepted in HE (Lomas, 2002). Quality as transformation requires a qualitative change in the learner to take place (Harvey & Knight, 1996). It is a process in which students develop confidence and self-awareness. Students not only acquire knowledge, but they also develop their capacity to understand and question existing ideas and assumptions by developing independent, critical thinking and creativity. That is, learning is a participative process in which the students take a leading role in assuring the quality of their own education (Harvey & Knight, 1996). With quality viewed as "fitness for purpose" the emphasis is on quality assurance. But when the view shifts to "quality as transformation," there is a transition to assurance-led quality enhancement, which is focused on the empowerment of students (Cheng, 2011). Currently, transformation is perceived as the most appropriate definition of quality in education (Centra, 2003; Bramming, 2007).

2.3. Quality of Teaching and Learning

Universities have many missions; teaching is one of them and research is another (Gibbs. 1995; Ewell, 2010). To students, however, teaching is the most important aspect of their college experience. An analysis of longitudinal data of student satisfaction surveys over eighteen years revealed that students are consistently more concerned with the course-related issues than the other social aspects of their experience (Kane, Williams, & Cappuccini-Ansfield, 2008). It follows logically, then, that the essence of QA must be to inspire HEIs to foster good teaching practices (Rozsnyai, 2010). In a review of institutional practices in QA over twenty years, Ewell (2010) found that the quality review processes now focus more on teaching and learning and require that institutions directly assess and provide concrete evidence of

student learning outcomes. This has rendered the QA process better directed to teaching and learning and the assessment of student performance (Ewell, 2010).

Teaching is not a condition for learning; people do learn informally and often without any kind of instruction. Teaching that does not produce learning is, however, a pointless activity and a waste of resources. Thus, the quality of teaching is judged by the ability of instructors to effectively achieve the desired learning outcomes. Several changes in the view of effective teaching and learning have developed in educational research in the past few decades: there has been a shift from the behaviourist theory of leaning to the cognitive and social-constructivist theories of learning (Shepard, 2000); from teacher-centred classrooms to student-centred classrooms (Shepard, 2000; Biggs, 1999; Whetten, 2007); from the focus on what a *student is* or what a *teacher does* to the focus on what the *student does* (Biggs, 1999); and from norm-referenced to criterion-referenced assessment methods (Shepard, 2000; Wolvoored & Anderson, 1998; McKeachie & Svinichi, 2006; Biggs, 1999).

Why are these new approaches considered more effective? In practice, college teachers set learning objectives for their instruction and state the desired student outcome. Students too have their own set of objectives that they want to achieve by attending college (Donald, 2004). Students either adopt a deep approach to learning or a surface approach to learning based on their own personal goals (Biggs, 1999, 2003). A deep learner is academically oriented, shows interest in the subject and is curious and motivated to learn. He or she seeks to understand and self-teach with little help from the instructor. Surface learner on the other hand, is vocationally oriented and wants to obtain job qualifications. He or she is not interested in any particular subject and aims to learn just enough to pass exams. This kind of student is less motivated and less committed to academic excellence (Biggs, 1999).

Learning approach can also be context-specific; a result of the interaction of the student with the learning environment (Biggs, 2003; Gibbs, 2010; Lindblom-Ylänne, 2010); students review and change their approach to learning in response to their perception of the learning environment. If a deep learner perceives a dissonance between the learning environment and the teaching methods used in a course and his or her learning approach, he or she may strategically adjust by adopting the surface approach to maximise their achievement in the course with minimal effort (Lindblom-Ylänne, 2010).

According to Biggs (1999), despite the initial advantage of deep learners in comparison to surface learners, good teaching practices reduce this gap. He defines *good teaching* as teaching practices that "discourage the surface approach to learning and encourage the deep approach" (Biggs, 1999, pp. 60). *Good teaching* is achieved by setting up the teaching and learning environment and selecting teaching and learning activities (TLAs) that will stimulate most students to use the higher order thinking skills that deep learners use spontaneously, thus reducing the gap between deep and surface learners. The teaching and learning environment that is likely to elicit students to adopt a deep approach to learning is student-centred

and focuses on what students do; an environment in which the student is an active participant in learning and not a passive recipient of information.

Biggs (1996) introduces a framework for enhancing teaching through constructive alignment. This framework combines two lines of thinking that are gaining recognition in HE: the constructivist learning theory and the instructional design literature, which emphasises alignment between the course objectives and the targets for assessing student performance. According to Biggs (1996), teachers must set learning outcomes that specify not just what they want students to learn, but also how they would manifest that learning in terms of "performances of understanding," i.e., in terms of what student should *do* in order to "specifically exemplify the deepest understanding of the content taught" (Biggs, 1996, pp. 353). The formal teaching activities planned by the teachers should engage students in activities they are likely to be required to perform in the way specified in the objectives. This alignment between learning objectives, teaching and learning activities (TLAs) and assessment practices must be embedded in course and curriculum design in order to effectively improve the outcome of instruction (Biggs, 1996, 1999 & 2003; Whetten, 2007).

It is worth noting that attempts to effectively enhance teaching need to address the system as a whole, not simply add "good" components, such as a new curriculum or methods (Biggs, 1996; Fink, 2003). Systemically promoting good educational practices helps maintain the focus of faculty, staff and students on the tasks and activities that guide students' development towards the achievement of the desired student outcomes. Arranging the curriculum and other aspects of the college experience to be congruent and in harmony with such good practices is likely to encourage students to put more effort into their studies (Kuh, 2004). With transformative learning as the ultimate aim of instruction, it is now established that students' engagement in "educationally purposeful activities is the single best predictor of their learning and personal development" in college (Kuh, 2004, pp. 1). Chickering and Gamson (1987) published the "Seven Principles for Good Practice in Undergraduate Education," which are now considered benchmarks for good educational practices that foster student engagement and the achievement of the desired learning outcomes (Kuh, 2001). These principles are: Student-faculty contact, cooperation among students, active learning, prompt feedback, time on task, high expectations, respect for diverse talents and ways of learning.

To reiterate, teaching and learning are the most important functions of HEIs. To be effective, QA efforts need to target teaching and learning activities and focus on student learning outcomes. Successful QA efforts foster the adoption of effective teaching and learning practices, the creation of student-centred teaching and learning environment and the use of teaching methods that will encourage most students to adopt a deep learning approach.

2.3.1. Quality of Clinical Training

Clinical teaching is a major part of the pre-doctoral dental education curriculum. Clinical training requires that students perform dental procedures on patients under supervision. The quality of the clinical training is assessed by the impact of the programme on the students' knowledge base and patient care (Fredekind, Cuny & Nadershahi, 2002). Quality patient-centred care focuses on the safety and well-being of the patient as primary concerns (Filker, Muckey, Kelner & Kodish-Stav, 2009). Other aspects of quality care include efficiency and timeliness of care, continuity of care and, most importantly, patient satisfaction (Formicola Bailit, Beazoglou & Tedesco, 2008). Patient satisfaction is essential for the proper functioning of dental teaching clinics because student learning is dependent on the availability of an adequate pool of patients for the students to perform a range of dental procedures. Patients are routinely screened before they are deemed candidates for receiving treatment by the dental students. Roughly, only about 60% of patients who are screened are accepted. Thus patients are usually in short supply in dental teaching clinics. Dissatisfaction of the patients with the services provided by the students can reduce their adherence to the treatment plan resulting in frequently missed appointments or no-shows. Teich, Wan and Faddoul (2012) found that when the percentage of broken appointments exceeds a threshold of 14.5 %, the students' clinical experience level deteriorates.

In clinical teaching, student learning is also essential. Quality clinical teaching programmes provide students with a range of experiences and help them build knowledge base and competence. The clinical experience should help students develop the skills that they are likely to transfer to their practices once they graduate; for the professional, this is the ultimate test of competence. The student is considered a partner in the learning process; students and faculty share the responsibility for ensuring the achievement of the desired learning outcomes.

In clinical training, students are both partners in the educational process and providers of services to their patients. The factors that affect the quality of the students' learning experiences and the factors that affect the quality of services provided to their patients intertwine. The IOM report recommends that dental school clinics should seek to be more patient friendly and efficient and provide students with a greater volume and breadth of clinical experiences (Field, 1995).

In the following sections, the common teaching models practised in pre-doctoral clinical training curricula are discussed, namely:

- Discipline-specific procedural requirements model
- The Comprehensive care curriculum
- Community-based education
- Teaching clinics as patient care centres

2.3.1.1. Discipline-Specific Procedural Requirement Model

The discipline-specific procedural requirements (DSPR) model is the traditional approach to clinical teaching in modern dental schools that prevailed during the 1980s. In this approach, students are required to successfully complete assigned numbers of discipline-specific procedural requirements in order to be assessed as competent for graduation (Park, Timothé, Nalliah, Karimbux & Howell, 2011; Park, Susarla, Nalliah, Timothé, Howell & Karimbux, 2012). DSPR model is driven by the students' and faculty's needs to complete the procedural requirements rather than the needs of the patient for dental care. It puts the educational objectives ahead of the care provision objectives and has been perceived as not being patient friendly (Field, 1995).

Moreover, DSPR does not support student learning; it helps students develop technical skills through the repetitive practice of a range of procedures, but it does not help them develop patient care skills. Spector, Holmes, and Doering (2008) found that the number of repeated procedure during clinical training does not predict clinical competence at graduation. Furthermore, because they will be assessed on the basis of the completed requirements, students are forced to focus on the specific procedures they need to complete and are not able or encouraged to adopt a philosophy of comprehensive dental care. Once the assigned numerical requirements are met, students are not motivated to engage in clinical activities, which results in poor attendance, underutilization of the clinic sessions, reduced student productivity and loss of learning opportunities (Park et al., 2011, 2012). It is likely that patient care is discontinued once the student has met the requirements, and patients are frequently transferred among students seeking to satisfy procedural requirements. Most importantly, upon graduation students have not gained sufficient experience in patient management, which is an essential skill for professional practice (Park et al., 2011, 2012).

By the 1990s it was clear that DSPR had many shortcomings. It was not patient-centred; the educational experience was focused on technical skills, but not on the humanistic values of patient care or the professional skills of patient management, which are equally important. It was recommended that the procedure-oriented model must be replaced by a patient and community oriented model that focuses on the outcomes and is team based and efficient (Field, 1995).

2.3.1.2. The Comprehensive Care Curriculum

The comprehensive care curriculum (CCC) is an approach to clinical teaching that provides more authentic learning experiences, approximating general dental practice, than does the traditional DSPR. The notion of comprehensive care has existed for at least forty years, and a series of conferences on the topic was held in 1969, 1975, and 1984 (Formicola et al., 2008). But it was not until the 1990s that it became the popular model of clinical teaching in dental schools. This shift was motivated by the need to focus learning onto meeting the treatment needs of the patients rather than the procedural requirements of

the students. Comprehensive care emphasizes the notion that the patient's health and well-being are more important than and take precedence over any procedure. In CCC, students perform patient-centred comprehensive care for an assigned patient. Treatment planning is an essential aspect of this model. Treatment plans are conducted by the student and are prioritized on the basis of the health and financial needs of the patient (Ford, Larson & Shultz, 1988); the student, then, takes the responsibility for performing all the needed procedures for his or her patient. Assessment of competence is based on the satisfactory and timely completion of all the needed procedures as per the approved treatment plan and to the patient's satisfaction. Thus students are encouraged to perform quality patient care and to learn the importance of patient management.

Evaluation of the effectiveness of CCC shows that it is superior to DSPR. The change to comprehensive care did not compromise the number of specific procedures completed by individual students (Evangelidis-Sakellson, 1999); on the contrary, student productivity increased and clinical time was more efficiently used (Holmes, Trombly, Gracia, luender & Keith, 2000; Park et al., 2011, 2012). There has been a reduction in patient transfer among students and smoother transitions when student providers graduate (Park et al., 2011). The CCC is found to be patient friendly, ethical and focused on patient-centred care (Filker et al. 2009).

As more dental school report adopting CCC, it was found that the implementation of the model is heterogeneous and there has been no unified definition of "comprehensive care" (Holmes et al., 2000). The inconsistency is particularly centred on whether or not there should be procedural requirements, which many believed were important to ensure students' learning of an acceptable spectrum of dental procedures. In a survey of the pre-doctoral clinical curriculum models at sixty-four North American dental schools (Holmes, Boston, Budenz & Licari, 2003), 58% of the schools reported that most patient care is provided in a comprehensive care clinical setting in which students address all aspects of each patient's dental needs; 22% provide patient care in discipline-specific settings; and 20% apply a hybrid of comprehensive care and discipline-specific settings (Holmes et al. 2003). Furthermore, two schools that adopted CCC in 1997, switched back to DSPR in 2002. Within their unique institutional circumstances, they explain, they needed to ensure an adequate breadth of clinical experience to their students (Holmes et al. 2003). Hybrid and discipline-specific schools feel that it is possible and may be more practical for dental students to provide patient-centred comprehensive care in a discipline-specific clinical setting. Holmes et al. (2003) found that the schools that implemented CCC were more likely to be located in more densely populated metropolitan areas, to be private institutions or to be located within a university medical centre with larger class sizes and more students enrolled in advanced training. These schools were also found to have a higher proportion of clinical-to-teaching track faculty, with more reliance on part-time and generalist faculty. In these schools, the same faculty members supervise both treatment planning and

patient treatment, and competency exams are the main means of assessment required for the completion of the curriculum (Holmes et al. 2003).

Comprehensive care is now considered the benchmark best practice for clinical teaching in dental schools. It has provided improvement in the quality of patient care and in the quality of the learning experience in teaching clinics. There is currently a continuing trend towards the adoption of the comprehensive care curriculum in dental schools (Holmes et al. 2003).

2.3.1.3. Community-based Education

The Pipeline, Profession, and Practice: Community-Based Dental Education Programmes, under the leadership of the Robert Wood Johnson Foundation and with the collaboration of the California Endowment and the W.K. Kellogg Foundation, is providing funding to test the value of off-site community-based clinical education (Formicola, Myers, Hasler, Peterson, Dodge, Bailit et al., 2006). Community-based clinical training provides senior dental students with extramural educational experiences at community-based dental care settings that serve marginalized and underserved groups. Working under the supervision of adjunct faculty, students get the opportunity to expand their understanding of the cultural and socio-economic differences of their patients and to develop their clinical skills. Perez, Allareddy, Howell and Karimbux (2010) reported that, according to the American Dental Association (ADA), in 2007, fifty-two out of the fifty-six dental schools in the US required community-based clinical experiences as a component of their curricula.

Comparison of student productivity in the community setting with the traditional dental school-based clinics found that senior dental students performed more procedures more efficiently and were twice as productive in the community setting. In this real clinical experience, students increased their cultural and socio-economic awareness and had the opportunity to encounter a more diverse patient profile and to treat a more heterogeneous pool of patients. Students reported having more confidence and self-esteem and feeling the value of the services they provide after serving in these community clinics (Perez et al., 2010). They, however, performed simpler and less specialized procedures at these sites than those performed at the school's teaching clinic (Bean et al., 2007).

Community-based education is still under scrutiny and it is too early to give the final verdict despite the initial positive educational outcome. Especially unclear is the impact that this model will have on the dental schools' finances (Le, McGowan & Bailit, 2011) as it is currently being funded by various national foundations. There is, nonetheless, so much enthusiasm about the educational value of community-based training that the Macy study team listed the inclusion of adequate time of clinical training in community-based care sites as one of the principles underlying educational reform in dental education (Formicola et al., 2008).

2.3.1.4. Teaching Clinics as Patient Care Centres

The Macy study team (Formicola et al., 2008) investigates models of clinical training that can be both educationally and financially sound. In the current models of clinical teaching, the student is the primary provider of care. Dental care provided in the teaching clinic is known to be inefficient because students do not generate sufficient income to cover the cost of running the dental unit (Formicola et al., 2006; Bailit et al., 2008). Teaching clinics have longer patient visits than the average private dental practice. Broken appointments and no-shows are common and can reach up to 30% (Teich, Wan & Faddoul, 2012). Furthermore, patients are routinely screened and roughly around forty per cent of potential patients are denied treatment because their needs are beyond the students' ability range. All these factors reduce the productivity of the student-operated clinic. While the CCC model has improved both patient care and student learning, the teaching clinic still cannot function without being heavily subsidized, which makes the financial challenge the number one problem in dental education today.

Formicola et al. (2008) draw attention to a historical vision of dental school clinics as "service" clinics that closely resemble private practices and that are operated by qualified graduate and licensed dentists, while dental students are assigned the treatments that they are prepared to perform. A clinical education approach that combines teaching and practice, as has been historically envisioned, was examined in the University of Pennsylvania experiment as Model B (Cohen, Cormier & Cohen, 1985; as cited in Formicola et al., 2008). In this experiment Model B was found to be educationally superior to the traditional approach and was also financially sound. Despite the experimental success, the University of Pennsylvania was not able to implement the model school-wide due to numerous practical impediments particularly the challenge of recruiting qualified faculty (Formicola et al., 2008).

The vision of teaching clinics as patient care service centres is seen as a possible solution to the dental schools' financial problems without compromising the quality of the educational outcomes of their programmes. This is, practically, how clinical oral surgery, clinical medicine and nursing are presently being taught. Yet, preparing adequate numbers of qualified dentists who are ready to combine teaching and clinical practice remains a major challenge.

To recapitulate, the comprehensive care clinical teaching model is more patient-friendly and educationally effective than the earlier discipline-specific procedural requirements model. The implementation of the comprehensive care curriculum however is diverse and lacks consensus. Furthermore, comprehensive care student clinics cannot financially cover the operational cost and need to be subsidized. In attempts to reduce the financial strain, calls for dental schools to diversify their clinical teaching by providing training at community-based centres have been evaluated. Community-based clinical training is found to improve the quality of clinical experiences of students, increase their confidence and provide dental services to a more diverse population of patients. However, its financial

impact is not yet clear. Running teaching clinics as patient care centres have also been found to improve the learning experience of the students and to be financially sound. Implementation of such model faces many logistical obstacles mainly in recruiting clinicians who would be ready to assume the concurrent teacher and practitioner roles. Currently, the comprehensive care clinical teaching model is considered a best practice benchmark in dental clinical education.

In the previous sections of this review, we have looked at the notion of quality in higher education in general and in dental education in particular. We examined the different proposed definitions of quality, and those definitions most suitable for the higher education context. We have also looked at the quality of teaching and learning in HEIs, and explored the different models of clinical teaching in dental schools. In the following sections, common practices in quality assurance and quality assessment will be explored in some detail.

2.4. Quality Assurance

Quality assurance (QA) can be defined as the process of establishing stakeholder confidence that provision (input, process and outcomes) fulfils expectations and measures up to threshold minimum requirements (Harvey, 2004-2007). Quality assurance is the process of ensuring that the product or service consistently meets standards (Sallis, 2002). As discussed above, several factors contribute to the growing interest in quality in higher education and make QA common place in HEIs (Figure 1). Even though the definitions focus on meeting minimum standards, the essence of QA is not just quality maintenance, but quality enhancement as well (Santiago et al., 2008).

A Quality Assurance System (QAS) sets the standards and describes the QA activities and processes that must be followed to maintain these standards. The QA activities can be internal, directed by the institution; or external, directed by governments or licensing and accreditation bodies (Harvey & Knight, 1996). Most QASs in HEIs implement a combination of both external and internal QA activities. Common QA practices include:

- Audits
- Accreditation
- Quality assessment or evaluation

An audit, in the context of HE, is a process for checking that procedures are in place to assure quality, integrity or

Why QA in HEI?

- ❖ Ensure cost-effectiveness of HEIs and demonstrate the effective spending of the public funds
- ❖ Ensure the congruence between the skills and competencies acquired at HEI and the needs of the knowledge-intensive labour market
- ❖ Inform and protect consumers
- ❖ Enhance HEIs' reputation and visibility
- ❖ Maintain a HEIs' competitive edge, nationally and internationally
- ❖ Ensure that the HE sector positively contributes to economic growth
- ❖ Regulate the growing number and diversity of the for-profit HEIs and educational systems

Figure 1: Why HEI engage in AQ activities

standards of provision and outcomes (Harvey, 2004-2007). It is a process to verify the effectiveness of the QA mechanisms in an HEI (Santiago et al., 2008). As an example, the QAS system at the institution subject of this study is presented next.

2.4.1. The Quality Assurance System

The university, like all HEIs in the country, works under the umbrella of the Ministry of Higher Education and Scientific Research (MHESR) and abides by its laws and regulations. The MHESR appoints the Higher Education Institutions Accreditation Council (HEIAC) to oversee the quality assurance activities within the higher education sector. The MHESR, represented by the HEIAC, is the national external body for quality assurance and assessment. The HEIAC is responsible for ensuring that the university sustains the national standards for the quality of higher education. It also ensures that the university is informed about any changes in the laws and regulations as a result of the periodic review and update of the standards and policies. For example, the reviewed edition of the Manual of Accreditation Standards and Quality Assurance for the Faculties of Dentistry was issued by the HEIAC in 2011. The new set of standards is expected to take effect in 2015.

Internally, the University Law (1972) specifies the rules and regulations for quality performance, and the university's administrative authorities represented by the Quality Assurance and Accreditation Unit (QAAU) enforce the law. The QAAU at the university assures quality through process and programme reviews and audits. They also ensure that the university functions in accordance with the quality specifications imposed by the HEIAC.

In addition to meeting the national standards, professional programmes are encouraged to seek accreditation and recognition from external national and international accreditation bodies in order to ensure that these programmes meet international standards as well. The Faculty of Dentistry is currently seeking accreditation by the Association for Dental Education in Europe (ADEE), (See section 2.4.2). The documentation of the self-study is being prepared by the quality assurance and accreditation committee at the Faculty of Dentistry under the leadership of the dean and the supervision of the QAAU.

To summarise the QAS at the Faculty of Dentistry (Figure 2) works closely with the administration of the university and with the Ministry of Higher Education and Scientific

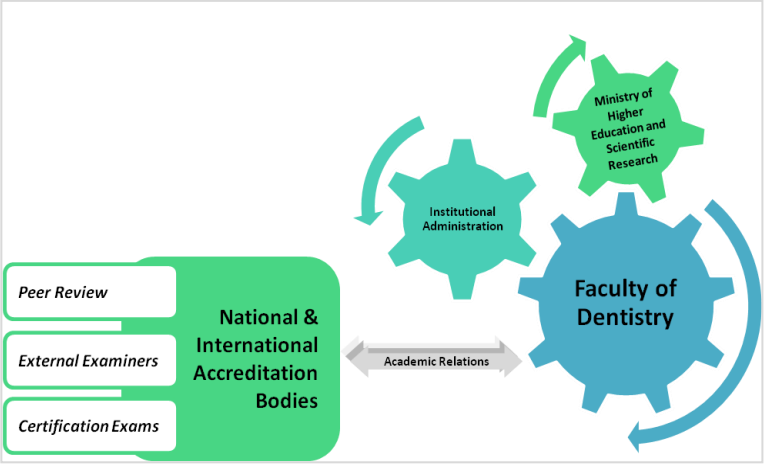

Figure 2: Quality assurance system at the Faculty of Dentistry

Research to ensure the delivery of quality programmes. The Faculty of Dentistry also maintains strong academic relations with other national and international accreditation bodies. These relations are primarily collaborative and aim to ensure that the programmes offered at the school meet international academic standards in order to maintain competitiveness and acquire visibility and recognition.

2.4.2. Accreditation

Accreditation is a form of external quality assurance by which an institution is evaluated against a set of standards usually specified by the accrediting agency. It is defined as the establishment of the status, legitimacy or appropriateness of an institution, programme or module of study (Harvey, 2004-2007). Accreditation is "a public and independent affirmation of the academic standards of institutions, and of the quality of the learning experience of the students who attend them" (Alderman, 2005, pp. 314). To the general public, accreditation is the best known and most respected form of QA (Bogue & Saunders, 1992). Accreditation matters to the public as it allows comparability of the quality of institutions to ensure 'value for money'. It is also beneficial to the institution or the programme as it initiates self-evaluation, which is the first step towards quality enhancement (Bogue & Saunders, 1992). Accreditation, however, is associated with a great deal of documentation and paperwork and an increase in workload and stress on the teaching staff (Law, 2010). It has been criticised as fostering bureaucracy and shifting power to the management with little effect on quality enhancement (Harvey, 2003). Furthermore, accreditation is based on the evaluation of the institution or programme against a set of minimum standards, thus it cannot totally eliminate the variation among institutions; but with accreditation the variation is not as severe (Bogue & Saunders, 1992).

Accreditation can be voluntary, carried out by the choice of the institution or programme or compulsory, done in response to governmental regulations and needs to assure minimum standards; it can also be done on the national, regional or international levels (GUNI, 2009). Accreditation agencies are numerous and may be publicly or privately controlled. One accreditation agency that is of particular interest to this study is the Association for Dental Education in Europe (ADEE).

The Association for Dental Education in Europe (ADEE) is an independent European organization founded in 1975. ADEE represents academic dentistry and the community of dental educators. The association plays an important role in enhancing the quality of dental education, advancing the professional development of dental educators and supporting research in education and training of oral health personnel. ADEE is committed to the advancement of health care through promoting high standards in dental education, developing the assessment methods, disseminating knowledge, and helping dental schools in QA through coordinating peer review visits. ADEE provides a European link with other bodies concerned with dental education; ADEE is the European representative in the International

Federation of Dental Educators and Associations (IFDEA), which represents dental educators worldwide[1].

The dental school is currently seeking accreditation from ADEE, and the preparation of the self-study is under way. The engagement in this QA effort has had several positive influences on the school. It raised the awareness of the faculty, staff and students on the importance of quality. It also stimulated the revision and improvement of some processes within the programme, such as the patient management and course evaluation processes.

Besides accreditation, quality assessment is another common QA practice in HEIs. The present study presents an assessment of the quality of the pre-doctoral clinical teaching programme. A look into some of the common practices of quality assessment is presented in the next section in some details.

2.5. Quality Assessment

Despite the difficulty to quantify such an intangible concept, it is important to be able to measure quality in order to be able to improve it. Many methods have been developed to assess quality in higher education, some with agreed upon validity and reliability. In this section, some of the approaches to the assessment of quality in higher education are briefly covered; namely: performance indicators, measuring service quality and the student perspective.

2.5.1. Performance Indicators

Performance indicators (PI) are measurable data that the HEIs gather in order to provide evidence for quality. PIs are used above all for the purpose of accountability and are often linked to funding, but they may be used for quality enhancement as well (Yorke, 1995).

There is a tendency to believe that what is being assessed is the only thing that matters. Thus, PIs outline the institutional priorities; especially when they are linked to funding, every effort will be made to present a satisfactory level of performance. It is, therefore, essential to ensure that a PI exhibits these characteristics: validity, reliability, communicability, resistance to manipulation and economic data collection and processing (Yorke, 1995). Ensuing from this is the argument that unless PIs exhibit these characteristics, they may have negative side effects and may result in lower standards and compromised quality. For example, linking funding to *programme completion* can cause grade inflation without a parallel achievement in learning (Yorke, 1995).

Gibbs (2010) presented the most commonly used PIs in higher education in an input-environment (process)-output framework (Table 1). The validity of input and environment (process) indicators is determined by their ability to predict outcome, while the output indicators are mainly used to compare the quality among institutions. According to Gibbs (2010), process variables provide the best indicators of the

[1] Association for Dental Education in Europe (ADFEE) official website at: http://www.adee.org/index.html

quality of teaching and learning in HEIs. However, many of these quality indicators only provide an indirect measure of the quality of teaching and learning in HEIs; direct measures of learning are scarce, even though teaching and learning is central in the HE sector (Educational Policy Institute, 2008).

*Table 1: Commonly used performance indicators in higher education**

Presage (input)	Process (environment)	Product (output)
- Resources / funding - Student: Staff ratio - Quality of students - Quality of the academic staff	- Class size - Class contact hours - Student study effort – independent study hours, and total hours - Level of intellectual challenge and student engagement - Formative assessment and feedback - The quality of teaching (as judged by students) - The effect of the research environment - Reputation (ranking) - Peer quality ratings - Quality enhancement process	- Student performance - Degree classification - Student retention - Employability of graduates - Products of learning: work students submit for assessment - Psychometric measures of generic outcome - Educational gain

* Source: Gibbs, 2010

2.5.2. The Students' Role in Quality Assessment

Out of all the stakeholders of academic institutions, students are considered to be the most important (Abdulla, 2005; Khan, Ishfaq & Nawaz, 2011; Williams & Cappuccini-Ansfield, 2007). Due to the increased international student mobility and the heightened competition of HEIs over student enrolment, students can no longer be taken for granted. Institutions and governments are interested in hearing their verdict on their college experiences (Williams & Cappuccini-Ansfield, 2007). Student involvement in the QA process is becoming a key priority and student feedback on their college experiences has emerged as one of the central pillars of the quality process in higher education (Zineldin, Camgoz Akdag & Vasicheva, 2011). The approaches to evaluate the student experience can be divided into two loosely bounded categories (Rowley, 1996):

- Methods that assess the student experience as a whole
- Methods that focus on students' assessment of teaching and learning.

These methods will be further elaborated in the following sections.

2.5.2.1. The Student Experience

The Student Satisfaction Approach was developed as a method of providing information about the students' experience from their own perspective. The Student Satisfaction Survey (Harvey, 1995; Hill, 1995) assesses the quality of the students' experience in college. It measures the students' satisfaction with a wide range of aspects of their college experience and the level of importance of these aspects to them. Some of the topics covered in the survey are contact with academic staff, assessment, course content and organization, student workload, teaching quality and financial circumstances. Other

nationally based surveys used to collect feedback on the total student experience, and are considered PIs by many governments, include the National Student Survey (NSS) in the UK, the Course Experience Questionnaire (CEQ) in Australia, the Mirror for Students' Survey in Sweden and the Students' Evaluations of Educational Quality (SEEQ), which is popular in the US and has been used in other parts of the world (Williams & Cappuccini-Ansfield, 2007). Bramming (2007) argues that high scores on student satisfaction surveys are not directly correlated with academic achievement (Bramming, 2007). Using the student satisfaction surveys to collect feedback from the students is, nonetheless, widely accepted as a means to assess quality in HEIs.

There is also the National Survey of Student Engagement (NSSE). The design of the NSSE is based on the notion that students' engagement in educationally purposeful activities is the single best predictor of their learning and personal development (Kuh, 2001, 2003). The NSSE assesses "the extent to which students are engaged in empirically derived good educational practices" (Kuh, 2004, pp. 2). It is established that colleges that engage their students in varied activities that contribute to their educational achievement are of better quality than those that do not. It's been also found that there is a strong relationship between NSSE scores and a range of educational outcomes (Gibbs, 2010). The NSSE has been thoroughly tested for validity, reliability and credibility and has been used to produce a set of national benchmarks for good educational practice (Kuh, 2001). It is therefore, considered a reliable tool for assessing the quality and 'value added' by students' higher education experience (Gibbs, 2010).

2.5.2.2. Students' Evaluation of the Quality of Teaching

Students' evaluation of the quality of teaching is considered a measure of the quality of their learning experience because a number of researchers have demonstrated an association between the quality of student learning and students' perceptions of teaching (Rowley, 1996). Administrative QA considers student surveys to be a powerful indicator of teaching quality, adequacy of course design, and the assessment of academic merit (Darwin, 2010; Rowley, 1996; Zhao & Gallant, 2012). Rowley (1996) suggests that evidence of how a course instructor or a department has responded to the student evaluation data and learned from their mistakes must be regarded as one of the most important indexes of its educational effectiveness (Rowley, 1996).

The student surveys have been criticised to focus on generic rather than discipline-specific criteria (Gibbs, 1995). Furthermore, beliefs about effective teaching affect how teachers teach and how students assess teaching quality. Hence in a teacher-centred environment, quality improvement can only be achieved by changing these beliefs because the students' evaluation of teaching emanates from their understanding of the characteristics of the effective teacher. (Zerihun, Beishuizen & Van Os, 2011).

Nonetheless, the literature shows that student ratings are the most valid source for the evaluation of teaching effectiveness (Cashin, 1995; Zhao & Gallant, 2012). In an extensive review of the literature

on student surveys covering over fifteen-hundred studies, Cashin (1995) concluded that "in general, student ratings tend to be statistically reliable, valid, and relatively free from bias or the need for control; probably more so than any other data used for evaluation" (Cashin, 1995, pp. 6).

2.5.3. Measuring Service Quality

Higher education has been increasingly recognized as a service sector that must respond to the expectations and needs of its clients, most importantly, the students (Abdulla, 2006; Oliveira, 2009; Sallis, 2002). Measuring service quality, thus, is increasingly important for universities in their competition to attract students and maintain tuition-based revenues.

Services are different from products and their inherent characteristics make them difficult to measure (Sallis, 2002). Services involve people-to-people interactions that are affected by the attitudes and behaviours of both parties: the provider and the receiver. Thus, it is almost impossible to eliminate variation in service provision in the same way as with physical products because of the inherent human variability. Furthermore, it is sometimes difficult to effectively communicate what the provider offers or what the customer wants from a service encounter, in which case dissatisfaction may not be related to the capability of the organization to provide. Finally, unlike products, service quality is not easy to monitor and cannot be mended or fixed; once the service encounter is completed, it is too late to change it. Any quality lessons learned can only be applied to future service encounters (Sallis, 2002).

Usually, the only indicator of the quality of a service is customer satisfaction. In order to be able to measure service quality, it is important to know how users make judgements on quality. Perceived quality is defined as the consumers' judgement about an entity's overall excellence or superiority (Parasuraman, Zeithaml & Berry, 1991b). Parasuraman et al. (1991b) think of service quality as an overall evaluation of a service encounter, and satisfaction comes from a comparison between the customers' expectations and their perceptions of performance. The difference, or gap, between expectations and perception determines the level of the customers' satisfaction with the service encounter. This gap theory forms the theoretical basis for the SERVQUAL (service quality) instrument developed by Parasuraman, Zeithaml and Berry (1988). SERVQUAL is a generic scale for measuring service quality. It consists of two sets of 22 statements, one set measures expectations about the quality of the service under evaluation and the other measures perceptions. The 22 statements on the survey are intended to represent five dimensions of service quality:

1. *Tangibles*: Physical facilities and equipment
2. *Reliability*: The ability to perform the promised service dependably and accurately
3. *Responsiveness*: Willingness to help and the provision of prompt service
4. *Assurance*: Understanding customers' needs and being courteous
5. *Empathy*: Caring and giving individual attention.

An example of a pair of statements from the *Tangibles* dimension:

Expectation: Excellent (type of service organization) will have modern looking equipment.

Perception: (XYZ organization) has modern looking equipment.

Typically, the expectations survey is completed before the service encounter, and the perception survey is completed afterwards. Scores are calculated by the difference between the two ratings. Logically, unless the customer's expectations have been exceeded, scores will always be negative. The smaller the gap, the better the service quality is.

SERVQUAL has been widely accepted as a tool to measure quality. It has been used to measure service quality in a variety of industrial, commercial and not-for-profit settings (Buttle, 1996). The survey can be used with the dimensions proposed by the original instrument, but in many instances the dimensions or items are changed to better suit a particular service context. Oliveira (2009), for example, adapted SERVQUAL to measure quality in an engineering programme.

Khan, Ishfaq and Nawaz (2011) conducted an empirical study to examine the impact of the quality of service on the level of student satisfaction and on their willingness to invest more efforts in their studies. They compared students' ratings of quality on the five dimensions of SERVQUAL with the scores on the students' satisfaction surveys and found that there was a significant association between students' satisfaction and all the SERVQUAL dimensions but one: *Tangibles* –which was not significant. They also found that the higher the students' satisfaction, the more they were willing to put effort into their studies (Khan, Ishfaq & Nawaz, 2011). Hence, measuring service quality provides an indirect measure of the educational quality.

Despite the popularity of SERVQUAL, it has been criticised for both its theoretical and operational aspects. It has been said that there is little evidence, theoretical or empirical, to support the gap theory as the basis for measuring service quality (Buttle, 1996; Cronin & Taylor, 1992); the validity of its factor structure, the five dimensions, has not been proven; and the two administrations of the survey cause boredom and confusion for participants (Buttle, 1996).

Cronin and Taylor (1992) rejected the framework of SERVQUAL, in particular the expectation-perception gap, as the basis for measuring service quality. They proposed a 'performance only' measure of service quality using only the SERVQUAL perceptions scale, and they called it SERVPERF (service performance). The empirical testing and comparison of the validity, reliability and methodological soundness of SERVQUAL and SERVPERF scales confirm the superiority of the latter in measuring service quality (Brochado, 2009; Cronin & Taylor, 1992; Sanjay & Gupta 2004).

Abdulla (2005) developed a scale to measure service quality in higher education and called it HEdPERF (higher education performance). She incorporated in the scale six dimensions that are confirmed in the literature to be "distinct and conceptually clear" and relate to the student experience in

HE (Abdulla, 2005 & 2006). The six dimensions that constitute the six-factor structure of HEdPERF are: non-academic aspects, academic aspects, reputation, access, programme issues and understanding. In an empirical study, Abdulla (2005) compared the HEdPERF and SERVPERF instruments. She showed that in terms of unidimensionality, reliability and validity, HEdPERF explained variance within the HE setting better than SERVPERF. This, she contends, gives a strong indication that HEdPERF is potentially more appropriate for use in the HE sector, but this is yet to be confirmed through further testing of the instrument.

Brochado (2009) compared all three abovementioned scales along with the importance-weighted variation of SERVPERF and SERVQUAL. The instruments were compared in terms of unidimensionality, reliability, validity and explained variance. She concluded that SERVPERF and HEdPERF present the best measurement capability, but it is not possible to identify which one is the best.

In this study, the student and the patient surveys were adapted from the SERVPERF model (see section 3.3). In addition to its superiority to SERVQUAL, the convenience of the SERVPERF model, as it requires only one administration rather than the two needed for SERVQUAL, was an important factor in the decision. Even though the measuring capability of the HEdPERF was comparable to SERVPERF, the six dimensions of the HEdPERF are not suitable for the assessment of the quality of clinical teaching. On the other hand, the generic nature of the SERVPERF scale allowed adjusting the survey items to better suit the context of this study (See indexes I & II). Finally, in clinical training, learning and service provision intertwine, and we are interested in the assessment of both the quality of the learning experience and the quality of services provided to patients. An association has been found between the students' rating of service quality and their satisfaction with their learning experience and their willingness to put effort into their studies (Khan, Ishfaq & Nawaz, 2011). Thus, measuring the students' rating of service quality gives an indirect measure of the students' satisfaction with their college experience. Therefore, the SERVPERF model provides us with the means to measure, with only one model, both the quality of the learning experience and the quality of services provided to patients.

To conclude, QA aims not only at assuring quality but also at enhancing quality. Institutions implement QA through a quality assurance system that is comprised of external and external components. An institution or a programme can be involved in several QA activities simultaneously. The most common QA activities include: audits, accreditation, and quality assessment. The ways in which quality can be assessed are numerous; choosing the best way to use is dependent on the context and objectives of the assessment.

In relation to this investigation, QA is a top priority and has full support from the leadership at the Faculty of Dentistry and the administration of the institution. This quality assessment is planned as an integral part of and complementary to the other QA activities within the school, namely the accreditation

by the ADEE and the process reviews.

3. The Current Investigation

In the previous section, a background review of the literature presented the notion of quality in higher education in general and in dental education in particular and the most common QA practices in HE. In this section, a closer look at the current investigation will be presented; the context, the methodology and the participants.

3.1. The Context

This study was conducted at the Faculty of Dentistry at a national university located at the heart of the capital city of a small developing country with an estimated population of around 7 million. The university was the first state-supported HEI to be founded in the country early in the 1960s. Its central location allows easy access to the university from all directions. Since its establishment, the university was dedicated to the advancement and dissemination of knowledge.

The Faculty of Dentistry was established in 1982 to become the first of only two schools of dentistry in the country, the second being the Faculty of Dentistry at another state-supported university located in a different region. There are currently no private dental programs offered in any of the private institutions.

The mission of the Faculty of Dentistry is congruent with the mission of the institution and includes:

- To advance oral health by fostering leadership in dental education and dental health care
- To ensure a constant supply of highly qualified and skilful dentists through continuous development of its curriculum to meet the advancement in medicine and dentistry worldwide
- To promote high quality fundamental and clinical research that serves the local community.

The Faculty of Dentistry works in close cooperation with the Faculty of Medicine. During the 2nd and 3rd years of the undergraduate program, dentistry students spend most of their time in the Faculty of Medicine studying the pre-clinical basic medical sciences; this knowledge is considered essential for the development of the clinical skills. Pre-clinical dental sciences are also taught during the 2nd and 3rd years of the undergraduate program. The clinical training curriculum starts at the fourth year of study, and extends over the fourth and fifth years, till graduation.

Some of the aspects of the context are of particular importance to the current study and will be discussed in more detail in the following sections. Namely: the development plans, the review of patient management practices at the school and the currently implemented clinical training curriculum.

3.1.1. Development Plans

The first student cohort was enrolled at the Faculty of Dentistry in the academic year 1984-1985. The dental school, which started as a single department, with only one full-time faculty member, a number

of part-time lecturers and 27 students, has considerably expanded over the past three decades. The number of students admitted has been growing every year and almost quadrupled; in the academic year 2011-2012, 97 students were registered in the fourth year and 134 in the fifth year at the undergraduate level. The number of full-time faculty has now reached 45. New full-time faculty members and teaching and research assistants are recruited based on the studies of the expected growth rate of the student population in order to maintain the global faculty-student ratio of 1:16-17 and the clinical faculty-student ratio of 1:8. Since the establishment of the school, about 1990 students graduated with the diploma in dental sciences (DDS) degree. Based on the last 5 years statistics, the average number of graduates in the first cycle with a DDS is 116 students per year.

This growth, however, has not been accompanied by a parallel expansion in the physical facilities and educational resources. The teaching clinic, located at the outpatient clinics at the university hospital, occupies an entire floor and provides around 99 dental units for undergraduate, postgraduate and specialty clinics run by faculty members. To cope with the increased demands, students are organised in groups of 8, and two-hour clinical training sessions are scheduled for the different groups of students throughout the working day. As a result of the heavy schedule, extreme pressure is exerted on the available facilities and resources, which are working beyond their capacity. The teaching clinic is especially affected, as the dental units are constantly being used in successive sessions so that there is very limited time for a proper periodic maintenance programme to take place. Even though most dental units have been renewed recently and plans are made to replace the rest, adding more dental units to accommodate the growing number of students is impeded by space limitations.

Aware of these challenges, the administration of the university has recently approved a proposed plan for an expansion of the teaching clinic facilities. The new facility will extend over an area of 10,656 m^2, and the estimated cost is equivalent to 10 million Canadian dollars The new clinic is expected to provide at least 200 dental units for undergraduate, postgraduate and specialty clinics run by faculty members in addition to new laboratories, sterilisation facilities and dental material warehouse and, most important, the infrastructure for a contemporary internal network that will facilitate appointment booking and entering and retrieving patient records. The new facilities are expected to overcome many of the shortcomings of the current ones, especially the teaching clinic. Due to financial constraints, completion of this project is not expected before 5-7 years. Given the present situation, the Faculty of Dentistry must manage to function to standard within the current constraints and, in the meantime, plan for a better future.

3.1.2. Patient Management

Dental students start clinical training at the student dental clinic in their fourth year of study and continue for five consecutive semesters or until they successfully complete the requirements for graduation. Pre-doctoral clinical training is provided exclusively in the teaching clinic located at the

outpatient clinics in the university hospital. The first task that students have to deal with as they begin clinical training is recruiting patients. In this dental school, patient recruitment is the responsibility of the students. The student clinic lacks a central patient record system. Patients' records, diagnoses and treatment plans as well as the procedures that have been carried out are kept by the students at the department in which the patient was treated. This makes patient management at the clinic cumbersome and substandard, a situation that is believed to be affecting the quality of students' learning and is identified by the administration as an urgent problem that requires an immediate solution. In order to improve the patient management practices at the teaching clinic, plans to install a centralized computer-based electronic patient record (EPR) system have been proposed and approved. This system will complement paper-based records and is expected to facilitate patient assignment to students and follow-up on the students' activities in the clinic. However, the implementation has faced many logistical obstacles; budgetary, regulatory and procedural issues have delayed the implementation process for years. At the time of data collection, the EPR system had not yet been put to actual use, but was, soon afterwards, at the beginning of the 2012 fall semester and is now being pilot tested. They are now using a central "hybrid" patient record system that amalgamates paper and electronic records. The various clinical forms and documents are kept in a paper-based patient's file. The patient information is also entered and managed using the electronic database.

Since the beginning of the 2012 fall semester, a new patient recruitment policy has been implemented whereby every patient must be registered at the reception desk to be eligible for treatment at the student clinic. The patient then receives a screening examination which is carried out by the intern dentists. A receptionist and an assistant are assigned to the 'reception and screening clinic' to facilitate the registration and screening processes. Based on the screening examination results, the patient is assigned to a student, using the electronic database. The students can access the electronic records from 13 PC stations distributed throughout the dental floor to obtain the contact information and schedule their assigned patients. The student must retrieve the patient's file before the treatment session. A student can provide treatment to his or her patient only if the patient has been registered and his or her records have been retrieved. The treatment progress and all the procedures completed are recorded in the file and dually signed by the patient and the student. Students are responsible for returning the patients' files complete with the updated records and signatures to the registration desk before the end of the clinic's working hours.

The administration has communicated the new patient recruitment guidelines with the staff and students. A student manual has been produced and distributed to students providing them with a detailed user guide of the new patient record system and the patient recruitment guidelines. The dean hosted a meeting with staff members to introduce the new system, and another meeting with the students of the

3rd, 4th and 5th years for the same purpose. A patient record committee was formed to supervise the implementation of the new guidelines. The patient record committee created a student Facebook© group so that students can post questions and share comments regarding the new system, which are followed up by the members of the committee. An audit of patient records is planned by the end of the fall semester to ensure the proper implementation of the new guidelines.

The introduction of this record keeping system was mostly positively perceived and considered successful in the short run. Though promising, it is too early for any assessment of its long-term effectiveness to be clear at this point.

3.1.3. The Pre-doctoral Clinical Curriculum

The school implements the discipline-specific procedural requirements model for the pre-doctoral clinical teaching curriculum; the traditional approach that was common at the time the school was established in the 1980s. As has been discussed in section 2.3.1, this approach has known shortcomings and is perceived neither to be patient-centred nor to provide the best learning experience for the students. In order to overcome the disadvantages of the curriculum, a comprehensive care component has been integrated into the senior students' requirements for graduation; but it constitutes only a small fraction of the total requirements, no more than 15%. Fifth-year students are required to complete and present a comprehensive treatment plan for one patient only. Description of the work requirements for the comprehensive case include endodontic treatment of at least one molar, one crown preparation and/or a partial denture, multiple operative procedures that add up to a minimum of 14 points (according to the point system currently in use) and periodontal management and maintenance. Pre- and post- models, radiographs, and photographs are to be taken for the patient. A patient's history, chief complaints and all the treatment procedures are to be documented for the final presentation of the case for the final assessment. Successful completion of the comprehensive treatment plan necessitates that the student maintain a long-term relationship with the patient that may extend throughout the entire academic year (8-10 months). It requires that the patient be treated in several departments: conservative, prosthodontics, endodontics, and periodontics and, sometimes, in surgery.

Students have encountered some difficulty fulfilling this requirement for a number of reasons: First, it is not easy to find a case that qualifies for the comprehensive treatment plan. Second, even when the case is available, students have difficulty completing the treatment plan because of lack patient commitment. A faculty member who supervises clinical training in the conservative department estimated that around 40% of senior students are having difficulty fulfilling this requirement.

It is worth noting here that fourth-year students are not required to complete a comprehensive case; they are assessed only on the basis of the completion of the procedural requirements. However, in order to avoid assessing students on the basis of the technical work and the mere repetition of the

procedures, the assessment of students' performance at the student clinic is based on multidimensional criteria. These dimensions are said to be taken into consideration in the assessment of the students' performance:

- The quantity of work done: This is measured by the number of procedures completed and their level of complexity. A point system transfers any treatment procedure into a pre-determined equivalent number of points. For example, the successful completion of a one-surface composite restoration is given 2 points and a composite veneer is given 5 points. No specific number of any particular procedure is required, but students are required to successfully complete a minimum number of points to graduate.
- The quality of work done: Each completed procedure is rated A, B, C, or D based on the quality of completed product, where A is outstanding, B is competent, C is a pass and D is unsatisfactory. An unsatisfactory result is considered a fail and the procedure must be redone. There are a number of specified conditions that, if they occur, will result in a D, for example an unjustified pulp exposure, but there are no set criteria to determine what an outstanding, competent or pass performance is; judgement is left completely to the discretion of the clinical supervisors.
- Patient management: The student is expected to conduct him or herself in a professional and ethical manner and to treat the patient with decency and respect for human dignity. This covers such aspects as following the cross-infection control guidelines, professionalism, attendance and respect of booked appointments and adhering to the dress code. Points are deducted for each violation of any of these requirements; yet again judgement on these aspects of performance is left completely to the discretion of the clinical supervisors.

These performance assessment criteria apply to both junior and senior students since the major part of seniors' clinical work is still based on the discipline-specific procedural requirements, while the comprehensive care constitutes only a minor component.

3.2. The Inquiry

In the current study, a quality assessment was planned in order to:

- Investigate the quality of student learning experience in the pre-doctoral clinical training
- Investigate the quality of services provided in the student clinic.

The investigation involves patients, students and faculty members who are considered primary stakeholders in clinical training. The study was planned in cooperation with the department of conservative dentistry. The department of conservative dentistry carries the highest number of clinical training hours and constitutes a major component of the clinical teaching. Because students spend longer hours in clinical training in this department than any other, any problems or concerns that they encounter will have the most impact on their performance. Despite that, this assessment is inclusive to all the

departments and all the specialties. The investigation will provide a more complete picture regarding the effectiveness of the clinical training curriculum, especially with the modifications to include the comprehensive care component and the multi-dimensional assessment criteria. By seeking quality assessment from the different stakeholders involved in the process we can develop a complete picture because this understanding of the quality is informed by the perspective of each group. This understanding will permit more effective and comprehensive solutions to be proposed, which can benefit the school in the present and guide the plans for future development and curriculum and process reviews.

The quality assessment results provide guidance to decision makers at the institution in their development efforts to ensure that resources are invested in the areas that will improve the quality of both the learning experience of the students and the services provided to patients.

3.2.1. Research Questions

In this study, patients assess the quality of services they receive; students assess the quality of learning they experience and the quality of services they provide to patients; and faculty members assess the quality of the teaching and learning activities they facilitate. Different dimensions of service quality are assessed, including tangibles, faculty members' responsiveness and empathy, employees' responsiveness and empathy, patient management practices, treatment planning practices and students' professionalism, as well as the general perception of quality. Specifically, this study aims to answer these questions:

- How do patients assess the quality of services they receive at the student clinic?
- How do students assess the quality of services they provide to their patients in their clinical training?
- How do students assess the quality of their learning experience in their clinical training?
- What are the major concerns that faculty members have regarding the clinical training provided to their pre-doctoral students?
- From the perspective of the teaching staff, what are the main problems that students face in their clinical training?

3.3. Methodology and Participants

A mixed methods approach to data collection was followed in this study. The mixed methods approach is known to provide rigour through triangulation by looking at the same problem from multiple perspectives. Both qualitative and quantitative data were collected and analysed. The students and patients were asked to complete surveys, while faculty members were asked to join a focus group discussion or have a one-on-one interview. In the following sections the data collection procedures and description of the participants are provided.

3.3.1. The Patient Perspective

We sought patients' input on the quality of services they receive at the student clinic. Patients were asked to complete a survey to give us their perceptions on the quality of service after at least one treatment session. The survey used to measure service quality from the patient's perspective was adapted from the SERVPERF model. The items in the original scale, however, were replaced by items more appropriate for this particular context. The survey consists of 20 items representing 5 dimensions. Patients were asked to record their perception of the quality of service in these different dimensions (Table 2): *Tangibles* (items 1 & 2), *Employees' empathy & responsiveness* (items 3-6), *Access to service* (items 7 - 12), *Students' aptitude & professionalism* (items 13 - 18) and finally their *General perception of the quality* of services and of dental treatment in particular (items 19 &20). Responses were rated on a ten point scale represented by the digits 0-9 where 0 represents total disagreement with the given statement, and 9 represents total agreement. An open-ended question asked patients to record their comments (Appendix I). The survey was translated and administered in the local language.

Table 2: The patient survey dimensions

Dimensions	No.	Survey Items
Tangibles	1	The dental clinics has modern looking equipment
	2	The dental clinics physical facilities are clean and visually appealing
Employees' empathy & responsiveness	3	Employees at the clinic give you individual attention
	4	Employees in the clinics are always willing to help you
	5	Employees in the clinics has your best interest at heart
	6	Employees in the clinic are never too busy to respond to your request.
Access to service	7	You only come to the clinic when you had an urgent problem.
	8	The clinic has operating hours convenient to you
	9	You found someone to treat you the first time you came to the clinics.
	10	It was easy for you to find a student interested in treating you.
	11	You come to all appointments with the same student till treatment is completed.
	12	You have to constantly look for another student to treat you
Students' aptitude & professionalism	13	The dental student looks and behaves like a professional
	14	The student is always respectful and courteous with you.
	15	Students have the knowledge to answer your questions.
	16	Students look like they know what they are doing.
	17	Treatment is performed correctly, you never needed to repeat the procedure
	18	You feel safe in your treatment session.
General perception of service quality	19	You are satisfied with the quality of service you received in the students' clinics.
	20	You are satisfied with the treatment the student provided and happy with the results.

3.3.1.1. Patient Participants

Students provide treatment to a wide range of people in the society: children, middle-aged or elderly men and women. Some are inhabitants of the capital city; others take long trips from the surrounding cities and villages. Treatment is provided by the students free of charge, at no cost to the patient. Therefore, patients at the student clinic are usually those who cannot afford to pay for treatment at a private practice, or to pay for dental insurance. Those who are insured seek the treatments that are not covered by insurance, such as fixed and removable prosthodontics.

Due to time constraints, convenience sampling method was used; throughout two working days,

the patients who were present at the clinic for their appointments were asked to complete the survey. Only patients 18 years or older were invited to participate. Young children and teens under 18 years of age are excluded from participation in this investigation. While returning patients were asked to complete the survey at their convenience, new patients were asked to complete the survey only after the end of the treatment session. A total of 32 patients participated in this study. Participants' ages ranged from 18 to 68 years old with a mean age of thirty eight (M = 38, SD = 14). Of the participants, 10 were males (31%) and 22 were females (69%). Most participants (81%) were returning patients who had been treated in the student clinics more than once, while only 19% were new patients finishing their first treatment session.

Surveys were administered by the researcher over a two-day period spent at the student clinic. Due to time constraints, it was not possible to recruit participants over a longer period of time, thus the sample size is fairly small. It is worth noting here that two illiterate patients completed the survey by the help of the researcher, several patients refused to complete the survey, and three patients did so improperly and their surveys were excluded from the study. Furthermore, patients were targeted at the main pool where the conservative and removable prosthodontics departments are, and not in all the departments. It is fair to say that this sample only represents a fraction of the patients being served in two working days, and does not give an indication of the actual number of patients served in a typical day at the clinic; hence it is not possible to estimate the participation rate. Patient survey data analysis and findings are presented in section 4.2.

3.3.2. The Student Perspective

Students in the fourth and fifth years of the programme were asked to complete a survey to give us their perceptions of the quality of the clinical teaching and the services they provide to their patients at the student clinic. The survey used to measure the quality of clinical teaching from the student's perspective was adapted from the SERVPERF model. The items in the original scale, however, were replaced by items more appropriate for this particular context. The student survey consists of 22 items representing 5 dimensions. Students were asked to record their perception of the quality in these different dimensions (Table 3): *Tangibles* (items 1-3), *Faculty members' empathy & responsiveness* (items 4-8), *Patient management* (items 9-13), *Treatment planning* (items 14 - 18) and finally their *General perception of the quality* of clinical teaching and services provided (items 19 -22). Responses were rated on a ten point scale represented by the digits 0-9 where 0 represents total disagreement with the given statement, and 9 represents total agreement. An open-ended question asked the students to record their comments (Appendix II). The survey was translated and administered in the local language.

Table 3: The student survey dimensions

Dimensions	No.	Survey Items
Tangibles	1.	The dental clinics has modern equipment
	2.	The dental clinics are well maintained
	3.	You are provided with all the tools and dental materials you need
Faculty members' empathy & responsiveness	4.	Faculty members at the clinic give you individual attention
	5.	Faculty members at the clinics are always willing to help you
	6.	Faculty members at the clinics have your best interest at heart
	7.	Faculty members at the clinic are never too busy to answer your questions
	8.	Faculty members have the knowledge and experience to answer your questions
Patient management	9.	The clinic has operating hours that are convenient to your patients
	10.	Patients always respect their appointments
	11.	It is easy for you to find a patient to treat
	12.	It is easy to transfer the patient to be treated by another student
	13.	It is easy to transfer the patient to be treated in another department
Treatment planning	14.	You plan treatment based on the patients' complaints and needs.
	15.	You plan treatment based on the course requirements you need to complete
	16.	You agree to treat a patient only if what they need is also the course requirement you have to complete
	17.	You usually plan to treat your patients in different departments
	18.	You usually have difficulty keeping the same patient for multiple treatments
General perception of the quality of clinical teaching	19.	You are satisfied with the services provided to the patients in the clinic
	20.	You are satisfied with the learning experience you have in the clinic
	21.	You feel confident that what you learn in the clinic will be applied in your practice
	22.	You feel confident that you will graduate as a competent dentist

3.3.2.1. Student Participants

Due to time constraints, a convenience sampling approach was used to recruit students. The survey was distributed at the end of lectures, and the purpose of the study was explained. Participation was voluntary, and only students who chose to participate completed and submitted the survey. A total of 125 students completed the survey, with a total participation rate of 54%. Among the participants, 58 students are in the fourth year (60% participation rate) and 67students are in the fifth year of study (50% participation rate). The majority of participants were females (80%), with a male-to-female ratio of 1:4. This ratio is comparable to the actual male-to-female ratio in the student population enrolled in the fourth and fifth years of the programme, which consists of 25% males and 75% females (a ratio of 1:3). Though males are slightly underrepresented in this sample, it fairly represents the female-majority student population.

With the successful completion of all the requirements, fifth-year students would be graduating by the end of the winter semester, only two months after they completed this survey. Graduation marks the end of their pre-doctoral training. After graduation, each student is required to complete a six-month internship before he or she is licensed for practice. Fourth-year students, on the other hand, would have completed one full year of clinical training at the time they completed the survey. Hence, all the students have experienced work at the student clinic for an adequate period of time to be able to give an informed assessment of the quality of their experience. Data analysis and findings are presented in section 4.3.

3.3.3. The Faculty Members' Perspective

An invitation was sent to all faculty members seeking their input by participating in a focus group discussion or giving a one-on-one interview. One part-time faculty member agreed to give a one-on-one interview and seven full-time members of the teaching staff participated in the focus group discussion; the overall participation rate is 16%. The focus group was held in the meeting room at the Faculty of Dentistry building. All participating dentists are directly involved in supervising clinical teaching at the student clinic. They have varying teaching experiences ranging from two to over twenty years. They represent different departments: Conservative Dentistry, Oral Medicine, Orthodontics, Radiology, Periodontology, and Oral Surgery. The discussion focused on questions regarding clinical teaching and patient management at the student clinic. In particular, the purpose of the discussion was to:

- Identify the faculty members' issues and concerns regarding the clinical teaching curriculum
- From the faculty perspective, identify the main problems that students face in clinical training
- Determine how these issues are affecting the students' learning and the quality of service

The focus group discussion questions are presented in Appendix III at the end of this document.
In the focus group, faculty members took the time to give their input by responding to each of the discussion questions or elaborate on others' responses. Each question was discussed until no one in the group had anything to add. We then summoned the next question, and so on until all the questions in the list were covered. Around 95 minutes of discussion in total were taped. Participants were asked to speak in English, but were welcome to speak in the local language if that made them more comfortable, so the session was a mix of both languages. The data were transcribed and all statements and comments were translated into English by the researcher. Analysis of the qualitative data is presented in section 4.4.

To reiterate, the current study was conducted at a dental school in a developing country. The dental school is relatively new, established around three decades earlier, during which it has grown substantially. The school is currently undertaking major development plans to expand its facilities. They are also implementing changes to improve the clinical teaching curriculum and the patient management practices at the student clinic.

Input on the quality of the clinical training was sought from students, patients and faculty members. Both qualitative and quantitative data were collected. Due to time constraints convenience sampling method was used to recruit participants. The data collection surveys have not been pilot tested or validated. However, because of the projection that these instruments will be used on the long term to assess the patient and student satisfaction as part of the routine QA, further testing and validation of these instruments is highly recommended. Data collection and research methods used in this study were carried out in accordance with the SSHRC Research Policy and Regulations and were approved by the Ethics Review Board at McGill University and by the Academic Research Committee at the Faculty of

Dentistry. A summary of the methodology and participants is presented in Table 4. Analysis of data and the findings of this inquiry are presented next.

Table 4: Summary of methodology and participants

		The Student Perspective	**The Patient Perspective**	**The Faculty Perspective**
Participants	***Who?***	Pre-doctoral students in the fifth and fourth year of study	Patients treated at the student clinic, 18 years or older	Faculty members supervising clinical training
	Sample size	125 students, $n_{y5} = 67$ & $n_{y4} = 58$	32 patients	8 faculty members
	Sampling	Convenience sampling	Convenience sampling	Convenience sampling
	Participation rate	54% in total, 50% for Y5 & 60% for Y4	Unknown	16%
Data Collection Method	***Instrument***	Student survey	Patient survey	Focus group & Interviews
	Pilot tested	No	No	N/A
	Validated	No	No	N/A

4. Data Analysis and Results

In this section, the results of data analysis will be presented. Both quantitative data and qualitative data have been collected and analysed from multiple sources. Patients (n = 32) and students (n = 125) completed surveys (Appendixes I & II). Faculty members participated in the focus group discussion (Appendixes III) or gave a one-on-one interview. Details on the participants and the data collection methods are presented in section 3.3.

4.1. The Quality Rating Scale

The student and patient survey items were rated on a ten point scale ranging from 0-9. Participants were instructed that a 0 at the low end represents total disagreement with the statement and a 9 at the higher end represents total agreement with the statement. Because all the survey statements are positively worded, total agreement with a statement would indicate strong satisfaction or a high quality rating, and the opposite is true; total disagreement would indicate strong dissatisfaction or a low quality rating.

For the purpose of easing the interpretation of the ratings, it is important to set a standard for a satisfactory quality rating that reflects the high standards and high expectations regarding the quality of services and the learning experiences at the school. However, we avoided setting very high standard for satisfaction to avoid the risk of underrating some of the aspects that are indeed satisfactory. Hence, the standard for a satisfactory quality rating was set to be higher than the mid-point of the scale at 5. A rating higher than 7, though, would indicate strong satisfaction or high quality. The standard for a dissatisfactory quality rating was set at 5 or lower. However, rating a statement at 3 or lower would indicate strong dissatisfaction or low quality.

In the following analyses, the frequencies of the participants' ratings of the survey statements are calculated and interpreted in the light of the standard for satisfactory quality ratings set above as follows: a participant rating of 8 or higher on a statement represents *strong agreement/ satisfaction* with the statement. A participant rating of 3 or lower represents *strong disagreement/ dissatisfaction* with the statement. Ratings of 6 or 7 represent *agreement/ satisfaction* and ratings of 4 or 5 represent *disagreement/ dissatisfaction* with the statement (Table 5).

Table 5: Interpretation of the ratings of survey items

Rating	Interpretation
Rating ≥ 8	*Strongly agree/ satisfied*
Rating 6 or 7	*Agree/ satisfied*
Rating 4 or 5	*Disagree/ dissatisfied*
Rating ≤ 3	*Strongly disagree/ dissatisfied*

Means of the participants' ratings are also calculated for each survey statement. Unlike the raw scores that are represented by a categorical scale of ten distinct points, mean scores are represented by a

continuous scale that ranges 0-9. Hence, based on the standard for satisfactory quality ratings set above, the mean scores will be interpreted as follows: mean scores that are higher than 5 represent *agreement/ satisfaction,* and those higher than 7 represent *strong agreement/ satisfaction.* Mean scores equal to or lower than 5 represent *disagreement/ dissatisfaction,* and those that equal to or lower than 3 represent *strong disagreement/ dissatisfaction* (Table 6). This interpretation of the raw and mean survey scores is applied to both the student and the patient surveys.

Table 6: Interpretation of survey items' means

Mean score	Interpretation
Mean is > 7	*Strongly agree/ satisfied*
Mean range 5 > - ≥ 7	*Agree/ satisfied*
Mean range > 3 - ≥ 5	*Disagree/ dissatisfied*
Mean is ≤ 3	*Strongly disagree/ dissatisfied*

4.2. The Patients' Survey Data Analysis

Data collected from the patients (N = 32) were entered in SPSS data file for analysis. Analysis was run using SPSS-PC v.19 statistical analysis software. The analysis conducted included descriptive statistics, frequencies and cross tabulations.

4.2.1. Descriptive Statistics of the Patients' Sample (N = 32)

Descriptive statistics of the patients' responses are summarized in Table 7. Means of the patients' responses to the items on the survey ranged from 4.7-8.8. Data show that patients are generally satisfied with the services provided in the student clinic, as most mean scores are within the satisfaction range. Patients are particularly impressed by the professionalism of the students (M = 8.4, SD=1.7) and the courtesy and respect with which they are treated (M = 8.8, SD= .76).

Table 7: Summary of the descriptive statistics for the patient sample (N=32)

No.	Survey Item	*n*	*M*	*SD*	*95% CI*
1	The dental clinics has modern looking equipment	31	6.9	2.5	6.0-7.8
2	The dental clinics physical facilities are clean and visually appealing	29	7.2	2.5	6.3-8.3
3	Employees at the clinic give you individual attention	32	7.7	2.4	6.7-8.5
4	Employees in the clinics are always willing to help you	31	7.7	1.9	7.0-8.4
5	Employees in the clinics has your best interest at heart	29	7.1	2.5	6.2-8.1
6	Employees in the clinic are never too busy to respond to your request.	31	7.2	2.5	6.2-8.1
7	You only come to the clinic when you had an urgent problem.	31	4.7	3.5	3.3-5.9
8	The clinic has operating hours convenient to you	31	7.2	2.3	6.4-8.1
9	You found someone to treat you the first time you came to the clinics.	31	7.8	2.2	7.0-8.6
10	It was easy for you to find a student interested in treating you.	30	7.6	1.9	6.9-8.4
11	You come to all appointments with the same student till treatment is completed.	29	8.2	1.5	7.7-8.8
12	You have to constantly look for another student to treat you	30	6.4	3.1	5.3-7.6
13	**The dental student looks and behaves like a professional**	**31**	**8.4**	**1.7**	**7.8-9.0**
14	**The student is always respectful and courteous with you.**	**30**	**8.8**	**.76**	**8.5-9.1**
15	Students have the knowledge to answer your questions.	30	8.1	1.2	7.7-8.6
16	Students look like they know what they are doing.	27	8	1.1	7.6-8.4
17	Treatment is performed correctly, you never needed to repeat the procedure	26	7.1	2.6	6.0-8.2
18	You feel safe in your treatment session.	32	7.6	2.4	9.6-8.4
19	You are satisfied with the quality of service you received in the students' clinics.	32	7.7	2.4	6.7-8.5
20	You are satisfied with the treatment the student provided and happy with the results.	31	7.4	2.5	6.4-8.3

4.2.2. Patients' Ratings of the Quality

In the following paragraphs, the patients' ratings of the quality will be discussed. Table 8 presents a summary of the patients' ratings on the survey items. For each item, both frequencies and percentages are presented.

Table 8: Summary of patients' ratings of quality

No.	Survey Item	*Strongly agree*	*Agree*	*Disagree*	*Strongly disagree*	*Total*
		16	7	5	3	31
1	The dental clinics has modern looking equipment	52%	22%	16%	10%	100%
	The dental clinics physical facilities are clean and visually	21	3	2	3	29
2	appealing	73%	10%	7%	10%	100%
		24	4	2	2	32
3	Employees at the clinic give you individual attention	75%	13%	6%	6%	100%
		22	5	3	1	31
4	Employees in the clinics are always willing to help you	71%	16%	10%	3%	100%
		17	5	4	3	29
5	Employees in the clinics has your best interest at heart	59%	17%	14%	10%	100%
	Employees in the clinic are never too busy to respond to your	20	4	5	2	31
6	request.	65%	13%	16%	6%	100%
		10	2	5	14	31
7	You only come to the clinic when you had an urgent problem.	32%	6%	16%	46%	100%
		17	8	4	2	31
8	The clinic has operating hours convenient to you	55%	26%	13%	6%	100%
	You found someone to treat you the first time you came to the	23	4	2	2	31
9	clinics.	75%	13%	6%	6%	100%
		20	6	2	2	30
10	It was easy for you to find a student interested in treating you.	67%	21%	6%	6%	100%
	You come to all appointments with the same student till	24	3	1	1	29
11	treatment is completed.	83%	11%	3%	3%	100%
		16	6	2	6	30
12	You have to constantly look for another student to treat you	53%	20%	6%	20%	100%
		29	1		1	31
13	The dental student looks and behaves like a professional	94%	3%		3%	100%
		29		1		30
14	The student is always respectful and courteous with you.	97%		3%		100%
		22	7	1		30
15	Students have the knowledge to answer your questions.	73%	24%	3%		100%
		18	8	1		27
16	Students look like they know what they are doing.	67%	30%	3%		100%
	Treatment is performed correctly, you never needed to repeat	15	6	2	3	26
17	the procedure	58%	23%	8%	11%	100%
		23	4	3	2	32
18	You feel safe in your treatment session.	72%	13%	9%	6%	100%
	You are satisfied with the quality of service you received in	24	3	2	3	32
19	the students' clinics.	75%	9%	7%	9%	100%
	You are satisfied with the treatment the student provided and	20	4	5	2	31
20	happy with the results.	65%	13%	16%	6%	100%

4.2.2.1. General Perception of the Quality

In general, patients are strongly satisfied with the services provided at the clinic (Item 19: M = 7.7, SD = 2.4). They are also strongly satisfied with the treatment provided by the students (Item 20: M = 7.4, SD = 2.5). In fact, most patients (75% & 65% respectively) strongly agreed with these statements,

indicating high satisfaction; and fewer than 10% of the patients indicated strong disagreement/ dissatisfaction.

4.2.2.2. Tangibles

Tangibles refer to the appearance of physical installations, facilities, equipment, personnel and communication materials in the surrounding environment where services are provided. Tangibles evidence is often perceived by users as a reflection of the quality of the service they receive.

Most of the patients (73%) strongly agreed that the physical facilities at the clinic are clean and visually appealing (Item 2: $M = 7.2$, $SD = 2.5$), and only 10% strongly disagreed. The patients also agreed that the clinic has modern looking equipment (Item 1: $M = 6.9$, $SD = 2.5$), though not as strongly since only about half of the patients (52%) strongly agreed with the statement while 10% strongly disagreed.

4.2.2.3. Employees' Empathy and Responsiveness

The patients rated highly the employees working at the student clinic on empathy and responsiveness. In terms of responsiveness, 71% of the patients strongly agreed that the employees working at the clinic are always willing to help them (Item 4: $M = 7.7$, $SD = 1.9$) and 65% strongly agreed that the employees are never too busy to respond to their requests for help (Item 6: $M = 7.2$, $SD = 2.5$). In terms of empathy, 75% of the patients strongly agreed that the employees give them individual attention (Item 3: $M = 7.7$, $SD = 2.4$), and 59% strongly agreed that the employees have the patient's best interest at heart (Item 5: $M = 7.1$, $SD = 2.5$). On the other hand, fewer than 7% of the patients strongly disagreed with any of these four statements.

4.2.2.4. Access to Service

In terms of access to the services at the student clinic, 55% of the patients strongly agreed that the operating hours of the clinic are convenient to them while fewer than 7% of the patients strongly disagreed (Item 8: $M = 7.2$, $SD = 2.3$). 67% of the patients strongly agreed that it was easy to find a student who is interested in providing treatment, and only 10% strongly disagreed (Item 10: $M = 7.6$, $SD = 1.9$). Actually, 74% of the patients strongly agreed that they were able to find someone to treat them the first time they came to the clinic (Item 9: $M = 7.8$, $SD = 2.2$).

In terms of continuing the treatment once it had started, 83% of the patients strongly agreed that they come to all their appointments with the same student till the treatment is completed (Item 11: $M = 8.2$, $SD = 1.5$). However, when asked if "you only come to the clinic when you had an urgent problem" (Item 7: $M = 4.7$, $SD = 3.5$), there was a split in the patients' responses: 32% strongly agreed while 45% strongly disagreed. A possible explanation could be in the way patients interpreted the meaning of the statement. It is likely that patients come to the clinic at first seeking treatment for an urgent problem, but then they are committed to their appointments till the end of the treatment. Patients who interpreted the statement to be asking about seeking treatment the first time for an urgent problem are likely to agree with

it, while those who believed it's asking about discontinuing the treatment unless an emergency arises are likely to disagree.

When asked if they have to constantly look for another student to provide treatment, 53% strongly agreed and 20% strongly disagreed (Item 12: *M* = 6.4, *SD* = 3.1). Of the 19% of the participants were new patients who have just completed their first treatment session, half (50%) strongly agreed with this statement. Among the returning patients, 74% agree, around half (52%) rather strongly that they had to constantly look for another student to provide treatment.

We may conclude that most patients are usually treated by different students for different needs. This finding is in fact against the recommended case completion and continuity of care, in which the same student completes all the procedures a patient needs. This is also typical to the discipline-specific settings, in which patients are constantly transferred among students who are looking to fulfil their procedural requirements. The high rating of this particular statement indicates lower quality of service.

4.2.2.5. Students' Aptitude and Professionalism

In general, the patients perceived the dental students as professional and knowledgeable. In terms of their professionalism: 94% of the patients strongly agreed that the student who provided the treatment looked and behaved like a professional (Item 13: *M* = 8.4, *SD* = .76), 97% strongly agreed that the student was always respectful and courteous (Item 14: *M* = 8.8, *SD* = 1.7), and 72% strongly agreed that they felt safe in the treatment session (Item 18: *M* = 7.6, *SD* = 2.4). The average disagreement with these statements was lower than 5% within the sample surveyed.

In terms of the students' aptitude: 73% of the patients strongly agreed that the students have the knowledge to answer their questions (Item 15: *M* = 8.1, *SD* = 1.2), and 67% strongly agreed that the students looked like they knew what they were doing (Item 16: *M* = 8, *SD* = 1.1). None of the participants was in strong disagreement with these statements, scores ranged from 5-9 on both items.

Most of the patients (58%) strongly agreed that the treatment was performed correctly the first time and they never needed to repeat the procedure; 11%, however, strongly disagreed (Item 17: *M* = 7.1, *SD* = 2.6). Reducing the number of repeated procedures in a dental school clinic is an indicator of good performance. The data indicate that only a minority of the patients needed to have certain procedures re-done; however, given the small sample size, it is more accurate to refer to other sources of data to determine the extent of repeats in the clinic.

In conclusion, the data show that the majority of patients treated at the student clinic are generally satisfied with the quality of services provided and with the treatment they receive. The facilities are seen as clean and modern; the staff members are perceived as sympathetic and responsive; and the dental students are perceived as professional and knowledgeable. The patients do appreciate the services they receive; they see the operating hours as convenient; they could easily find a student who was interested in

treating them and were generally committed and respectful of their appointments.

On the other hand, a good number of patients reported that they need to constantly look for a student to treat them. A minority reported that they needed the procedures to be re-done. These are areas for review and future improvement. They are also considered informative indicators of the quality of services in a dental clinic.

When interpreting the patient data, it is important to consider the socio-economic class of the patients treated at the student clinic. As the treatment is provided at no cost to the patients, it is likely that the student clinic attracts patients from low socio-economic class who cannot afford private dental care. Hence, the majority of patients may not have in mind an exemplary model of dental services to compare to; to them the service at the student clinic is second to nothing.

The main limitation to the investigation of the patients' perceptions of service quality is the sample size. The survey was administered in a limited period of time, within two days at the end of the week around the end of the academic year. Therefore the sample may not be representative of the actual patient population. And of those surveys completed, only 32 of the patients' surveys were included in this analysis.[2]

In the analysis of the patient data, all the patients were treated as one group. Due to the small sample size, there has not been any differentiation in the quality ratings between males and females or new and returning patients' subgroups.

The patients' ratings were generally at the positive high end, which is interpreted as a high level of satisfaction with the services. This may very likely represent the patients' actual satisfaction as the services are provided at no cost to them. Having surveyed the patients at the end of the academic year, it is likely that we met the group of patients who were completing their treatment and were indeed satisfied. It is also likely that the patients interpreted the scale as yes-no questions and their answers were mostly affirmative and at the high end of the scale. In any case, and due to the small sample size, it is advisable to survey the patients over a longer period of time and during different times of the year and of the day in order to obtain the most variability. Also, other sources of data, such as patient's complaints, repeated work and discontinued treatment, can give a clearer picture of patients' satisfaction with the services.

Finally, the data collected from this survey may be used for descriptive purposes only and not for inferential purposes. It gives a snapshot of the patients' perceptions of service quality and the level of their satisfaction with it, but it cannot – and should not – be used to evaluate teaching and learning at the student clinic. A more accurate source of information should be used for such purposes.

4.3. The Students' Survey Data Analysis

Data collected from the students' survey (N = 125) was entered in SPSS data file for analysis.

[2] Three surveys were deemed unfit and were excluded from the analysis

Analyses used SPSS-PC v.19 statistical analysis software. The analyses included descriptive statistics, frequencies and cross tabulations.

4.3.1. Descriptive Statistics of the Students' Sample (N = 125)

Descriptive statistics of students' responses to the survey items are summarized in Table 9. Means of the students' responses ranged from 3.06-7.59. Data show that the students are mostly satisfied with the level of knowledge and expertise of the faculty members (M = 7.59). They are most dissatisfied with the difficulty of patient recruitment (M = 3.06) and retention (M = 3.7); and with the inadequacy of the dental equipment maintenance (M = 3.59)

Table 9: Summary of the descriptive statistics for the students' sample (N=125)

No.	Survey Item	*n*	*M*	*SD*	*95% CI*
1.	The dental clinics has modern equipment	125	4.14	1.75	3.83-4.49
2.	The dental clinics are well maintained	125	3.59	1.94	3.25-3.93
3.	You are provided with all the tools and dental materials you need	125	4.18	2.16	3.79-4.56
4.	Faculty members at the clinic give you individual attention	125	4.70	2.36	4.29-5.12
5.	Faculty members at the clinics are always willing to help you	125	5.43	2.4	5.01-5.86
6.	Faculty members at the clinics have your best interest at heart	124	5.07	2.34	4.66-5.49
7.	Faculty members at the clinic are never too busy to answer your questions	124	5.51	2.5	5.06-5.95
8.	Faculty members have the knowledge and experience to answer your questions	124	7.59	1.58	7.31-7.87
9.	The clinic has operating hours that are convenient to your patients	125	4.94	2.06	4.57-5.3
10.	Patients always respect their appointments	125	3.70	2.24	3.31-4.1
11.	It is easy for you to find a patient to treat	124	3.06	2.32	2.64-3.47
12.	It is easy to transfer the patient to be treated by another student	124	3.92	2.62	3.45-4.39
13.	It is easy to transfer the patient to be treated in another department	124	4.56	2.51	4.12-5.01
14.	You plan treatment based on the patients' complaints and needs.	125	6.46	2.06	6.09-6.82
15.	You plan treatment based on the course requirements you need to complete	125	6.51	2.25	6.11-6.91
16.	You agree to treat a patient only if what they need is also the course requirement you have to complete	125	6.17	2.54	5.72-6.62
17.	You usually plan to treat your patients in different departments	124	6.46	1.97	6.11-6.81
18.	You usually have difficulty keeping the same patient for multiple treatments	125	4.94	2.54	4.49-5.39
19.	You are satisfied with the services provided to the patients in the clinic	125	5.26	2	4.9-5.61
20.	You are satisfied with the learning experience you have in the clinic	125	5.53	2.15	5.15-5.91
21.	You feel confident that what you learn in the clinic will be applied in your practice	125	6.74	2.02	6.38-7.09
22.	You feel confident that you will graduate as a competent dentist	125	6.70	2.04	6.34-7.07

4.3.2. The Students' Rating of the Quality

In the following paragraphs, the students' ratings of the quality will be discussed. Table 10 presents a summary of the students' ratings on the survey items. For each item, both frequencies and percentages are presented.

Table 10: Summary of students' ratings of quality

No.	Survey Item	*Strongly agree*	*Agree*	*Disagree*	*Strongly disagree*	*Total*
1.	The dental clinics has modern equipment	1	28	47	49	125
		.8%	22.4%	37.6	39.2%	100%
2.	The dental clinics are well maintained	5	15	43	62	125
		4%	12%	34.4%	49.6%	100%

3.	You are provided with all the tools and dental materials you need	8 6.4%	24 19.2%	49 39.2%	44 35.2%	125 100%
4.	Faculty members at the clinic give you individual attention	12 9.6%	39 31.2%	36 28.8%	38 30.4%	125 100%
5.	Faculty members at the clinics are always willing to help you	31 24.8%	33 26.4%	31 24.8%	30 24%	125 100%
6.	Faculty members at the clinics have your best interest at heart	21 16.9%	38 30.6%	29 23.4%	36 29%	124 100%
7.	Faculty members at the clinic are never too busy to answer your questions	35 28.2%	29 23.4%	32 25.8%	28 22.6%	124 100%
8.	Faculty members have the knowledge and experience to answer your questions	75 60.5%	31 25%	16 12.9%	2 1.6%	124 100%
9.	The clinic has operating hours that are convenient to your patients	11 8.8%	45 36%	39 32.2%	30 24%	125 100%
10.	Patients always respect their appointments	7 5.6%	20 16%	35 28%	63 50.4%	125 100%
11.	It is easy for you to find a patient to treat	6 4.8%	14 11.3%	29 23.4%	75 60.5%	124 100%
12.	It is easy to transfer the patient to be treated by another student	17 13.7%	17 13.7%	31 25%	59 47.6%	124 100%
13.	It is easy to transfer the patient to be treated in another department	17 13.7%	35 28.2%	27 21.8%	45 36.3%	124 100%
14.	You plan treatment based on the patients' complaints and needs.	48 38.4%	43 34.4%	21 16.8%	13 10.4%	125 100%
15.	You plan treatment based on the course requirements you need to complete	51 40.8%	41 32.8%	19 15.2%	14 11.2%	125 100%
16.	You agree to treat a patient only if what they need is also the course requirement you have to complete	51 40.8%	27 21.6%	26 20.8%	21 16.8%	125 100%
17.	You usually plan to treat your patients in different departments	42 33.9%	49 39.5%	20 16.1%	13 10.5%	124 100%
18.	You usually have difficulty keeping the same patient for multiple treatments	24 19.2%	31 25.6%	29 23.2%	40 32%	125 100%
19.	You are satisfied with the services provided to the patients in the clinic	13 10.4%	46 36.8%	45 36%	21 16.8%	125 100%
20.	You are satisfied with the learning experience you have in the clinic	21 16.8%	51 40.8%	27 21.6%	26 20.8%	125 100%
21.	You feel confident that what you learn in the clinic will be applied in your practice	52 41.6%	46 36.8%	18 14.4%	9 7.2%	125 100%
22.	You feel confident that you will graduate as a competent dentist	49 39.2%	44 35.2%	23 18.4	9 7.2%	125 100%

4.3.2.1. General Perception of the Quality

The students were generally slightly satisfied with the services provided to patients at the clinic. They were split between agreement (47.2%) and disagreement (52.8%) on item 19 (M = 5.26, SD = 2): "You are satisfied with the services provided to the patients in the clinic", with only a minority taking a strong position at either side. Among all respondents, 10.4% strongly agreed and 16.8% strongly disagreed with the statement.

Similarly, the students were on average slightly satisfied with their learning experience in the clinic. The majority (58.6%) agreed with item 20 (M = 5.53, SD = 2.15): "You are satisfied with the learning experience you have in the clinic," where 40.8% agreed and 16.8% strongly agreed with the statement. On the other hand, around 42% of the students disagreed with this statement, with half of them

taking the strong position.

The students rated high their confidence level that they would graduate as competent dentists, as 74.4% agreed with item 22 (*M* = 6.7, *SD* = 2.04): "You feel confident that you will graduate as a competent dentist." They also rated almost as high, their confidence that they will transfer what they have learned at the clinic into actual practice with 78.4% agreeing with item 21 (*M* = 6.74, *SD* = 2.02): "You feel confident that what you learn in the clinic will be applied in your practice." Only 7.2% of the students strongly disagreed with both statements.

4.3.2.2. Tangibles

Students rated tangibles low on quality as most of the students are not satisfied with the equipment they use, the maintenance level or the supply of tools and material. Among all respondents, 76.8% of the students disagreed with item 1 (*M* = 4.14, *SD* = 1.75): "The dental clinic has modern equipment," with 39.2% taking a strong position. Only one student (.8%) strongly agreed with this statement. Dissatisfaction was even higher with maintenance, as 84% of the students disagreed, 49.6% rather strongly with item 2 (*M* = 3.95, *SD* = 1.94): "The dental clinics are well maintained." As to the supply of tools and dental materials they need, the students are also dissatisfied as 74.4% of students disagreed, 35.2% rather strongly with item 3 (*M* = 4.18, *SD* = 2.16): "You are provided with all the tools and dental materials you need." There is, however, more disagreement with item 3 among the fifth-year students than the fourth-year students. Of those students who strongly disagreed with item 3, 65.9% are in the fifth year; and of those who agreed 62.5% are in the fourth year of study.

4.3.2.3. Faculty Members' Empathy and Responsiveness

Professors' capability and expertise is one aspect of their clinical learning experience that students do appreciate very well. Among all participants, 85.5% agreed, 60.5% strongly, with item 8 (*M* = 7.59, *SD* = 1.58): "Faculty members have the knowledge and experience to answer your questions". Students are also satisfied with the level of faculty members' responsiveness. Responsiveness is defined as the willingness to help and to respond promptly. Students are split between agreement (51.2%) and disagreement (48.8%) with item 5 (*M* = 5.43, *SD* = 2.4): "Faculty members at the clinics are always willing to help you", with almost half of each group taking the strong position (Figure 3). Similarly, students are split between agreement (51.6%) and disagreement (48.4%) with item 7 (*M* = 5.51, *SD* = 2.5): "Faculty members at the clinic are never too busy to answer your questions", with almost half of each group taking the strong position (Figure 3).

Empathy is defined in terms of the provision of caring and individualized attention. Students are, on average, slightly dissatisfied with the faculty members' empathy as only a minority of students (9.6%) strongly agreed with item (*M* = 4.7, *SD* = 2.36) 4: "Faculty members at the clinic give you individual attention", while 30.4% of students strongly disagreed with the statement. The rest of respondents took a

less strong position: half of them slightly agreed (31.2%) and the other half (28.8%) slightly disagreed that they receive individual attention from faculty members at the clinic. On average, students responded slightly more favourably to item 6 (*M* = 5.07, *SD* = 2.34): "Faculty members at the clinics have your best interest at heart." Among all respondents, 16.9% of the students strongly agreed while 29% of the students strongly disagreed with the statement. The rest of respondents took a less strong position: some of them slightly agreed (31%) and some slightly disagreed (23.4%) that faculty members have their best interest at heart.

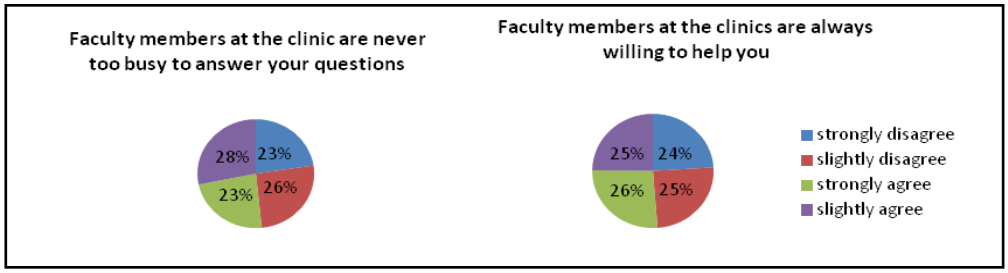

Figure 3: Faculty members' responsiveness; students' responses to items 5 and 7

4.3.2.4. Patient Management

This dimension looked at the processes that bring the patient and the dental student together in the treatment session where services are provided to patients and students' learning occurs. Aspects investigated include convenience of operating hours, patient recruitment, appointments and patient transfer. Though these aspects are administrative rather than educational, their impact on the service provision and learning experience is substantial. These are also important determinants of the quality of a private dental practice.

Most students (83.9%) do not believe it is easy to find a patient to treat with 60.5% strongly disagreed with item 11 (*M* = 3.06, *SD* = 2.32): "It is easy for you to find a patient to treat", which makes recruiting patients the most challenging aspect of the clinical experience that students have to deal with. In addition to the initial difficulty, even after patients are recruited, they do not necessarily respect their appointments or continue the treatment. 78.4% disagreed, 50.4% rather strongly with item 10 (*M* = 3.7, *SD* = 2.24): "Patients always respect their appointments." Only 5.6% of students strongly agreed with this statement.

The student clinic operates 9:00-17:00 on weekdays only; it does not operate evenings or weekends. This is apparently affecting the convenience and flexibility offered to patients since 56.2% of the students disagreed, 24% strongly, with item 9 (*M* = 4.94, *SD* = 2.06): "The clinic has operating hours that are convenient to your patients." Only 8.8% of students strongly agreed with this statement.

Patient transfer is another aspect of patient management which students struggle with. Most

students do not find it easy to transfer patients to be treated in different departments. Among all respondents, 58.1% disagreed, 36.3% strongly, with item 13 (*M* = 4.56, *SD* = 2.41): "It is easy to transfer the patient to be treated in another department." Yet, 13.7% of the students strongly agreed with this statement. Students find transferring patients to be treated by another student even more challenging as 72.6% disagreed, 47.6% strongly, with item 12 (*M* = 3.92, *SD* = 2.62): "It is easy to transfer the patient to be treated by another student." Only 13.7% of students strongly agreed with this statement. The ease of transferring patients to be treated by another student or in another department is important to assure continuity of care. If a student is not able to assure that the patient receives the needed treatment in another department or by another student, he or she may be forced to abandon the patient. This is particularly common in settings that focus on procedural requirements and do not enforce case completion and patient-centred care; once the student completes the needed requirements he or she loses interest in continuing the treatment.

It is worth noting here that these data were collected before the installation of the electronic patient record system and before the new patient management guidelines took effect. At the time, the administration recognized patient management practices at the clinic as problematic, and these data confirm that. The students expressed their strong dissatisfaction with the situation and identified patient management as a problem. These data can be useful as a base-line to which the level of success of the new system can be compared in the future.

4.3.2.5. Treatment Planning

Treatment planning is done at early stages of treatment after the initial patient screening. The treatment plan specifies the procedures that need to be carried out for the patient, as well as their priority order. Most of the students (72.8%) agreed, 38.4% strongly, with item 14 (*M* = 6.46, *SD* = 2.06): "You plan treatment based on the patients' complaints and needs". Interestingly, 10.4% of the students strongly disagreed with this statement. Given that the students' clinical performance is assessed on the basis of the completion of specified procedural requirements, what procedures are needed is an important factor in the treatment planning decisions on the part of the students. Therefore, it is not surprising that most of the students agreed (73.6%), 40.8% strongly with item 15 (*M* = 6.51, *SD* = 2.25): "You plan treatment based on the course requirements you need to complete." Course requirements also affect the initial decision to engage with a patient or not. Since patient recruitment at the clinic is the responsibility of the students themselves, they tend to engage with patients whose needs match the procedures they are required to do. This is apparent, as most students agreed (62.4%), 40.8% strongly with item 16 (*M* = 6.17, *SD* = 2.54): "You agree to treat a patient *only* if what they need is also the course requirement you have to complete."

The students, in general, plan to treat their patients in different departments. The majority of students (73.4%) agreed, 33.9% strongly with item 17 (*M* = 6.46, *SD* = 1.97): "You usually plan to treat

your patients in different departments." However, some students face difficulties when they try to keep their patients for multiple treatments as 44.8% of students agreed, 19.2% strongly, with item 18 (M = 4.94, SD = 2.54): "You usually have difficulty keeping the same patient for multiple treatments". More than half of the respondents (55.2%), however, do not agree with this statement, 32% rather strongly. The difficulty in keeping the patient for multiple treatments is felt more strongly by the fifth-year students than the fourth-year students as 62.5% of those who strongly agreed with item 18 are in fifth year and 62.5% of those who strongly disagreed are in their fourth year.

4.3.3. The Comprehensive Case

Fifth-year students are required to complete and present a comprehensive treatment plan for only one patient as a graduation requirement. The student must complete these minimal requirements for his or her patient: Endodontic treatment of at least one molar, one crown preparation and/or a partial denture, multiple operative procedures and periodontal management and maintenance. Successful completion of the comprehensive treatment plan requires that the student maintains a long-term relationship with the patient and provide treatment in several different departments. The data show that students are facing some difficulty fulfilling this requirement. As it is their responsibility to recruit patients, it is not easy for students to find a case that qualifies for the comprehensive treatment plan. Then, even when the case is found, the students are having difficulty completing the treatment plan because of lack of the patient's commitment. These difficulties sum up the relatively high percentage of fifth-year students who stated that they were not able to fulfil this requirement. When we asked the fifth-year students whether they believed that they would manage to complete the comprehensive case in time for graduation, only 57.6% said "yes" and as many as 42.4% said "no." To demonstrates the scale of the problem that the students face, note that the survey was administered only two and a half months before the end of the academic year, yet more that 40% of students believe that this requirement will not be fulfilled on time.

In conclusion, the students' input shows that they are only moderately satisfied with their clinical learning experience and with the services provided to patients in the student clinic. The aspect they appreciate the most is having experienced and knowledgeable faculty members who are responsive and empathetic. They do, however, face challenges, particularly in the dimension of patient management. Though this is an administrative rather than an educational matter, its impact on the students' learning and patient care is substantial.

This analysis has some limitations. It is descriptive in nature and is not intended for inferential purposes or to determine causality. In the analysis, all the students, those in the fourth year and in fifth year of study were treated as one group. There has been no comparison of the two subgroups despite the qualitative differences in skill level, clinical experience and the clinical training requirements between the senior and junior students. Hence, we do not know if fourth year and fifth year students would rate quality

differently because of these differences and in which aspects. Similarly, due to small sample size, there has not been any differentiation in the quality ratings between male and female subgroups.

These data can be used as a base-line to which the effectiveness and level of success of quality improvement efforts can be compared in the future, in particular the evaluation of the newly implemented EPR system.

4.4. The Qualitative Data Analysis

Qualitative data were collected from multiple perspectives. The faculty members provided their input by participating in the focus group discussion or giving a one-on-one interview. Students and patients were asked to record their comments in an open ended question at the end of the survey. Participants provided their input either in the local language or in English, or a mix of both languages. All comments were translated into English for the purpose of analysis and reporting.

The qualitative data from all the different sources were transcribed and analysed. Keeping in mind that the main interest of this investigation is to assess the quality of the learning experience and the services provided to patients, a preliminary reading through the transcript helped identify segments of the text that can provide answers to the research questions. These segments were labelled with codes. After reading the transcript several times, some common themes started to emerge through the grouping of related codes to reduce redundancy and overlap. Eventually, the high number of codes was collapsed into 8 broad themes. A more thorough examination of the themes revealed several sub-themes nested within the broader themes (Figure 4). Some themes were analysed from multiple perspective, as data was provided by faculty, students and/ or patients. The thematic analysis revealed mostly ordinary themes; no unexpected themes or hard-to-classify themes were encountered. It is believed however that some of the themes can be considered major themes and others are only minor themes when we look at how well the theme answers the research questions.

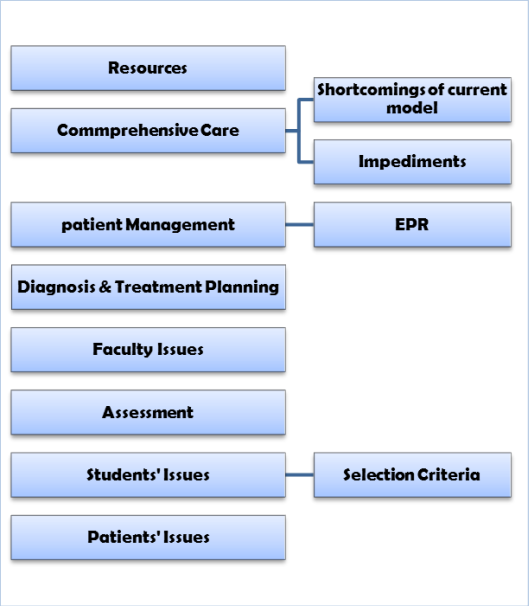

Figure 4: Themes and sub-themes

In the end eight themes and four sub-themes were extracted: *Resources*; *Comprehensive approach to patient care*, which includes two sub-themes: Shortcomings of the current curriculum and Impediments to the implementation of the comprehensive care curriculum; *Patient Management*, which includes one sub-theme: Electronic patient management system; *Diagnosis and Treatment Planning*; *Faculty Members'*

Issues; *Assessment*; *Students' Issues*, which includes one sub-theme: Selection criteria; and finally *Patients' Issues* (Table 11). To ensure accuracy of interpretation of the data, the analysis results have been sent to three faculty members who participated in the focus group or have given an individual interview for member checking. They were asked to note any misinterpretation they recognize in the data analysis results. None of the three participants have noted any misinterpretation or inappropriateness of the given analysis.

In the following sections, the themes are individually described along with a detailed description of some of the processes and with samples of the data presented at the end of each section. The themes are described only qualitatively and are not quantified, thus the following descriptions do not differentiate minor and major themes, nor determine their relative importance or influence on the quality of the learning experience or the quality of services provided.

Table 11: Summary of the results of the thematic analysis of the qualitative data

Theme	Description
Resources	Resources are limited and the physical facilities need a serious upgrade
Comprehensive approach to patient care	The implementation of the comprehensive approach to patient care is not enforced in the student clinic. The traditional discipline-specific procedural requirements curriculum is still the dominant approach in the clinic. The input emphasized two aspect related to this theme: - ***Shortcomings of the current clinical curriculum***, which is in line with the known shortcomings in the literature - ***Impediments of the wider implementation*** of the comprehensive care curriculum
Patient management	Patient management practices are sub-standard due to the lack of a central patient record system in the student clinic. The responsibility of patient recruitment is left to the students who find that a huge burden. Faculty members condemn the situation because it limits collaboration between departments and makes it difficult to follow up on patients' treatments, monitor student-patient activities and transfer patients among departments. Deploying the ***Electronic patient record system*** is considered the proper solution; discussion of this topic centred on the anticipated benefits and concerns.
Diagnosis and treatment planning	There is a confusion regarding the functioning of the diagnosis clinic whether it is a course requirement or a screening clinic. The screening of patients is insufficient to provide an adequate pool of patients to all 250 students in clinical training. Thus most patients can receive treatment without being adequately examined, or having a formally approved treatment plan. This result in treatments governed by the patient's chief complaint and/or the students procedural requirements needs, and generally results in discontinuity of care.
Faculty issues	Faculty members have high inter-examiner variability and lack consensus on the learning objectives of the clinical courses.
Assessment	Student's competency is assessed by the quality and quantity of work completed, but more emphasis is given to the quantity than to quality. Furthermore, assessment emphasizes the procedure rather than the case, hence that also is the focus of students: the procedural requirements.
Student issues	Students are overstressed with the long working hours, the need to complete the procedural requirements and the struggle to find patients. ***Student selection criteria:*** are limited to achievement in the high school certification exam, and the financial ability in the case of the parallel stream.
Patient issues	Patients are mostly from a low socio-economic class who seek free dental care. Their commitment to the maintenance of oral health is limited.

4.4.1. Resources

The main problem that this dental school faces is the same problem faced by all dental schools worldwide, limited finances: "The first problem we face is finances and resources." Financial constraints limit dental schools' ability to invest in their physical facilities and educational resources, and this dental

school is no exception. Resources are very limited and the physical facilities need a serious upgrade. The quantity and quality of dental units are insufficient for the existing number of students. The dental units are constantly in use and the maintenance is neither systematic nor adequate. Over-use and under-care further shorten the life span of the dental units. Whenever a dental unit is out of order, the student is forced to cancel the appointment and valuable clinical time is lost, as there are no extra units that the student can use to replace the broken one. A student summed up the situation by noting that "The clinics need renewal and regular maintenance to avoid wasting clinic time for no good reason."

There is also a shortage in the supply of dental materials, which is perceived by the students as problematic and limiting. A faculty member stated, "we do have some shortage of [dental] materials … we do not have much luxury in terms of enough materials that they [students] can use, that is a problem for students." Patients on the other hand seem to be concerned more about the sanitary condition of tools and equipment.

Financial problems cast a shadow on every project that is proposed or planned to improve the conditions at the clinic. Some of the plans that are being deferred due to limited finances include hiring support staff, assistants and hygienists, currently there are none; increasing the number of composite light cures to parallel the increased demand on composite fillings; renewing the digital radiography machine; and the installation of the computerized patient record system, which was delayed for years, in part due to financial reasons, and was eventually installed on a limited number of computers. A faculty member anxiously said, "The problem is that there are no resources… no money … that is what we always hear every time anyone says anything."

It is worth noting here that the Faculty of Dentistry has approved plans to expand its facilities as described in section 3.1.1, which will be funded jointly by the government and the institution; however, this is not expected to be completed before at least 5-7 years, subject in part to the availability of the funds. Table 12 presents some of the participants' comments on the issue of resources.

Table 12: Resources and the quality of physical facilities

Participants input on the tangibles	
Faculty Members' Comments	"The first problem we face is finances and resources"
	"The problem is that there are no resources… no money … that is what we always hear every time anyone says anything"
	"The resources are scarce in terms of infrastructure and support staff"
	"The main concern is the quality of the [dental] chairs, number and quality. Some of the chairs, they lack light or they do not actually respond to movement"
	"[Dental] units are very busy and constantly in use… 2 hour sessions with only 15 minutes break between sessions. There are only two technicians for maintenance and there is no systematic maintenance system. This in effect shortens the life span of the units"
	"…the [dental] units, if something went wrong, we do not have extra units so that the student can move on to another unit and complete the treatment. The number of the units, the condition of the units, they do not get maintained frequently so we have a lot of problems with them"
	"In the dental units, the bench is too small… there's barely enough space for the tools"

	"We do have some shortage of [dental] materials … we do not have much luxury in terms of enough materials that they can use, that is a problem for students"
	"They [students] wish to have more material and equipment"
Students' Comments	"The number of students highly exceeds the capabilities of the faculty and the hospital"
	"The clinics need renewal and regular maintenance to avoid wasting clinic time for no good reason"
Patients' Comments	"You must pay more attention to the sterilization of tools"
	"Please care about the quality of the equipment and ensure it is clean"

4.4.2. Comprehensive Approach to Patient Care

Comprehensive patient care is a theme that was persistently brought up by the faculty members. The faculty members realize that comprehensive care constitutes only a very small fraction of the patient care being provided: "the holistic comprehensive look at the patients constitutes only a small fraction of the patients that are seen." They also realize that it is a better approach to clinical teaching that must be enforced: "comprehensive decision making process needs to be enforced a little better." Faculty members' comments regarding the current approach to patient care varied between stating what they think is a disadvantage of the current curriculum and giving their reasons for not implementing the comprehensive care approach more widely. Students' comments also touched on this issue, particularly the negative effects they feel the discipline-specific procedural requirements curriculum has on their learning experience.

4.4.2.1. Shortcomings of the Current Curriculum

The shortcomings of the current clinical curriculum that were identified are presented here. Table 13 presents some quotes from the faculty members on this matter.

Faculty members recognize that the current clinical teaching curriculum is not patient-centred. It is driven by the students' need to complete the procedural requirements: "Patients are being treated according to [the] priorities of the students… and not according to their needs." Hence, the students' need takes precedence over the patients' needs.

Students' performance is assessed on the basis of the successful completion of the procedural requirements. In their approach to care provision, students focus mainly on the procedures they need to complete to get the grade. This not only governs the students' approach to patient treatment, but also limits their learning to technical skills. One faculty member noted that students are "stressed to fulfil [the] number of requirements and not to fulfil the main skill list." Students do feel that the focus on the numerical requirements is distracting; one student commented, "As students we face too much stress, the number of requirements are too much; in a sense it makes us forget about the main reason we wanted to become dentists…" Similarly, another student said: "We switch our interest from learning to completing the points only. We do not concentrate on the more valued goal of perfecting our work even though we put 100% of our effort to patient care." This focus on the requirements inhibits the students from approaching individual patients as complete and distinctive human beings and impedes the adoption of a

comprehensive care approach: "… they [students] tend to focus on a tooth problem or a quadrant problem and not looking at the patient as a whole," which makes some faculty members worry about the ethical and moral implications of this approach.

Discontinuity of care is another point that was consistently raised. Students pick and choose patients according to the needed procedures. Once the student's requirements are fulfilled, patients are either neglected or treated by another student who needs to complete his or her requirements. The faculty members are quite concerned about the long-term effect, especially the transfer of the learnt skills to practice. Faculty members fear that in their practices, the students will continue to put their needs ahead of their patients'. They are also concerned that the students are not adequately learning some of the important skills, particularly those related to patient management such as prioritizing treatment plan based on the patients' needs, referral skills, record-keeping skills and simply putting the patients' needs first and giving them what they are looking for.

Table 13: Faculty's perceived shortcomings of the curriculum

Perceived shortcomings of the current clinical teaching curriculum	
Not patient-centred	"… so the patients are being treated according to what the student needs" "The service at the clinics is student-centred, but not patient-centred." "Patients are being treated according to priorities of the students… and not according to their needs"
Focus on procedural requirements	"Our system is focused on [the] number of requirements for the student and not how comprehensive the treatment [of the] patient is." [students focus on] "finding the right case that suits the requirements" "… it [clinical teaching] is more points driven rather than patient driven" "… the student would like to do the requirements to get the marks for the patient's cases" [Students are] "stressed to fulfil [the] number of requirement and not to fulfil the main skill list" "Our system is focused on [the] number of requirements for the student and not how comprehensive the treatment for [the] patient is."
Ethical concerns	"So I think that the moral issue here makes me more worried… we should sort of put the moral issues more as a priority … and to concentrate also on improving the culture of dental care…"
Students fail to adopt a comprehensive approach to patient care	"…students are focused on the tooth and the requirement but do not see the patient as a whole." "… they [students] tend to focus on a tooth problem or a quadrant problem and not looking at the patient as a whole"
Transfer of skills from training to practice	"… if [students] are trained to treat the patient according to [their] needs this means that probably later on when [they] are a clinician after graduation [they] also may be treating patient according to [their] interests." "If we are not training our students to refer properly or to use the referral culture as they call it, probably later on [in their] own practice, [they] will not believe in referrals … and that will deprive [the] patient from important treatments." "… [The] student in his own practice… [will] not have good record keeping. Students do not know what to write in the patients' records." "[When] he [student] understands that this is how you approach your patient he will then do the same thing in their private practice" "…when the student graduates; [if] the patient does not want amalgam anymore, [he or she] can't make him amalgam fillings regardless."
Discontinuity in care	"… simply the same patient is not necessarily treated by the same student" "… simply the students choose. They choose according to the requirements. So the patient may get

	treatment or may not according to the students." "In some cases when student finish a requirement they just ignore the patient and the rest of his dental problems" Patients are either neglected, or they take advantage of the students' need to complete the requirements [used the expression: *blackmail* by patients].

4.4.2.2. Impediments to a Broader Implementation of Comprehensive Care

The main impediments to a broader implementation of the comprehensive care curriculum that were identified are presented here. Table 14 presents some quotes from the faculty members on this matter.

The main factor that faculty members view as an impediment to a broader implementation of comprehensive patient care is the departmental organization of the physical plant: "Our clinics are subdivided into operative on some days, endo on some days and prosthodontics on a different day. So you can't actually do comprehensive treatment required for the same patient in a timely manner." In each department, students can only perform the procedures that are related to that specific discipline, whether that is operative, endodontics, periodontics, surgery or prosthodontics. If the patient needs a procedure that falls under a different specialty, it cannot be performed until the student's scheduled session in that department. Or, if the needed treatment cannot be delayed, then the patient is sent to be treated by a student who is in session at that department. A common example is requiring the patient to go for cleaning and oral hygiene at the periodontal department before any operative treatment can be performed.

Clinical supervision is led mainly by specialists, who supervise only the procedures that are related to their particular discipline. Comprehensive care requires team work and cooperation between specialties, but this is not available in the current heavily sub-divided system. In addition, the schedules of clinical supervisors make it difficult for them to follow up on multiple patient treatments. In fact, it is possible that more than one supervisor will follow up on a multi-session treatment: "…if [a student is] working on a three unit bridge [the student] could be working with three different people [clinical supervisors] at three different stages of treatment"; and at any given session, the faculty member will probably see only "…part of that treatment not the whole treatment."

Faculty members believe that comprehensive care provision requires that dental units be located in the same pool and that team work and more cooperation between departments be enforced, which can only be achieved by a policy change at the school level and not by individual departments. They also recognize that curricular change is governed by the institutional regulations and follows a long and time consuming procedure.

Despite the fact that comprehensive care is not the main approach to care provision, faculty members still believe that the treatment provided by students is done well and of good quality: " So we're not 100% sure that we're finishing comprehensive complicated treatment plans for every single patient,

but whatever treatment is given is always given at an acceptable level." Therefore, in this teaching clinic there is no compromise on the quality of services provided to patients: "…once the treatment is given it is given at a high quality." However, enforcing comprehensive care has very well recognised benefits that, they believe, are worth pursuing: "besides of course having better integration between specialties; the ultimate objective in the very end is better service and better patient care." The notion of comprehensive care has been well communicated to students, who seem convinced that a change is necessary; as one student said, "I wish the system in the clinic changes so it becomes a comprehensive clinic so we can work in it based on the patients' priorities and faculty members from all specialties are always available."

Table 14: Faculty's perceived impediments of a broader implementation of comprehensive care

Perceived impediments of a broader implementation of comprehensive patient care	
Departmental organization of the physical plant	"Our clinics are subdivided into Operative on some days, Endo on some days and prosthodontics on a different day. So you can't actually do comprehensive treatment required for the same patient in a timely manner" "…if all clinics were in the same pool that would promote a comprehensive approach for the patients" "…the problem I think is this issue of separation between departments, we do need something centralized" "…it depends upon team work" "…it needs the consent of all the departments … and whether the colleagues are wishing to be more cooperative"
Policy change is needed	"…it has to be a policy, a faculty [school] policy not a department policy" "…organization [change] is mandatory" "…there should be a link between the different departments …it's the organization process" "The policy [need to be changed], whenever we have an organized system everyone should follow" "[the solution is] reversing the faculty culture by proper educational programmes"
Role of Clinical supervision	"…if [a student is] working on a three unit bridge [the student] could be working with three different people [clinical supervisors] at three different stages of treatment" "…the faculty member … might be seeing part of that treatment not the whole treatment"
Institutional regulations	"Changing curriculum. It is doable, but it does take quite a bit of time to get done"

4.4.3. Patient Management

Patient management is an important and pressing issue in the student clinic. Patient recruitment is the responsibility of the students, which is perceived by students as a huge burden. A student went as far as calling it "the patient problem." Students have difficulty finding patients who qualify for being treated at the student clinic. They frequently expressed their wish that the school takes the responsibility of providing the patients; one student commented, "Students need the university to take the responsibility of providing patients."

Faculty members are aware of the problem. They believe that the lack of a central patient record system makes it difficult for faculty members to follow up on the student-patient activities beyond the specialty department in which they work; "There is no follow up and it is difficult…" This problem, they believe, is negatively affecting the inter-departmental cooperation, particularly in terms of patient referral and follow-up. If the patient is found to require treatment in another department, then neither the teaching faculty nor the student will have an effective method to refer the patient. The patient is simply asked to

seek treatment in that department first, and that delays the completion of the needed procedures. Furthermore, once in the other department, the patient is re-examined again as that department will not have access to the patient's records; and this is considered a waste of time and resources. Table 15 provides some of the students' and faculty members' input on this matter.

Table 15: Patient management issues

Patient management issues		
Students' input	Patient recruitment is a problem. The problem is:	"I hope the '*Patients* problem' is solved!!" "… all problems that student might face in bringing patients" "… because of the lack of patients and lack of time" "It is very, very, difficult to find patients…"
	Solution:	"Students need the university to take the responsibility of providing patients"
Faculty members' input	Awareness of the problem	"They [students] do face the problem of… they would like to have their patients provided for them rather than looking for patients [themselves]. Many students come and tell us that.
	Follow up	"… sometimes the follow up of those patients is not waterproof kind a thing… we lose those patients to follow up…" "There is no follow up and it is difficult…"
	Referral	"The problem which I think is very significant is the referral system. Referral is very important… you have to ensure that your patient is referred to the right clinic…" "The patient most of the time comes to the Perio clinic because they told him at the Cons clinic that you need to get teeth cleaned first… the patient was examined once but I will have to re-examine him from a to z again… this is waste of resources."
	Effect on student learning	"In the end, the learning that the student gained from the interaction with patient is minimal"

4.4.3.1. Electronic Patient Records

At the time these data were collected, plans to install a centralized computer-based electronic patient record system had been proposed and approved, but it had not yet been installed. The input from faculty members regarding this project centred on two main points: their expectations of the benefits of the new system and their concerns about possible limitations. Table 16 provides some of the faculty members' input on this matter.

Faculty members believe that having a centralized patient record system is a medico-legal requirement, and that not having one is unacceptable. They expect that the new system will improve the educational process substantially by allowing the faculty members to better supervise the students' work, aid in the assignment of patients, facilitate referral between departments, and simplify assessment by making the grades for students' work available electronically. Therefore, it is expected that the system will provide good solutions to some of the current difficulties in patient management. Faculty members have some concerns as well. The primary concern is the number of computers that will be available; especially the "ratio between [the number of] students and the number of computers: we have now 8 computers in the clinic and these are expected to serve 250 students." The low computer-to-student ratio

is making some faculty members sceptical of the effectiveness of the new system; they expect that "there will be load and there will be delay more than benefit." Thus some faculty members actually oppose the plans. Faculty members suggested simplifying the data entry process so that it would not take a long time for the student to enter the data, causing discouragement and lack of commitment. Others were concerned that the departmental division and functioning of the student clinic will cause them to have to deal with multiple data sets.

Remote access to the network has been suggested as a solution to the low number of computers in the network, so that the students may access the records using their own laptops or the computer lab at the university. This brought concerns regarding the security of the patients' records and the patients' right to confidentiality. Securing an intranet, as is planned, is much easier and less costly; permitting remote access via the internet will cause a cost increase that the school simply cannot afford.

Table 16: Faculty's expectations and concerns regarding the patient record system

Electronic patient record system	
Expectations	"…preferred to be a computerized or central one, this will the make the educational process between the students highly organized… Then it will lead patients' care to an excellent way. It will keep the students' records in a good way to be corrected or to be supervised" "…the presence of records is a minimal requirement… [to] not have a system is absolutely unacceptable" "One of the bare minimums is having good patient records for patient care… to do an audit process, or a retrospective research, or the QA at the end of the year. If we do not have that record system we basically are unable to do any of these processes… it's a bare minimum and a problem in that it is a crucial one." "It's a medico-legal requirement… besides, when [the students] know someone else is going to follow [-up], students are going to be more careful about the patient, and the commitment [to] the patient that the student has to learn." "Then the faculty member will be able to assign this patient [to a student]" " … computer to use at the end of the session to enter all the information needed such as the grades" "… so these computers are left for the staff for example to enter the grades" "So if you have a list of twenty new patients you know [their needs] and you know which student needs to finish this requirement you can assign the patient to that particular student"
Concerns	"… [some] reservations especially the number of computers, their locations, their accessibility. Mostly [the] ratio between students and number of computers, we have now 8 computers in the clinics these are expected to serve 250 students" "… the number [of computers] is relatively low in relation to the number of students" "There will be load and there will be delay more than benefit" "… the process [should not] not become exhaustive where the student will spend an hour entering data" "… and the time student needs to enter the information; because the longer it takes…. there would be delays" "… there's some resistance from the faculty members that this is something new, it is a new task that they have to do…" "… if the student saw the patient a week earlier in the oral diagnosis and had all the information, then the process can go smooth" "… the student enters all the information before he gets to his session" "… if the data entered from home or here in the computer room then things may be easier" "Intranet… the idea of remote access… we get into the network security and encryption of data and we end up with a much more costly project, because if you start talking about security… you are dealing with patients' data. With patients' data it becomes even more sacred and way more difficult. "… my concern will be multiple data sets we deal with" … the dean has the political will that this has to be done. We have to do it somehow… there are limited resources, but at least we have started something hopefully we will be able to build on it… so whatever funds

we can allocate we will try"

The EPR system was deployed soon after data for this study were collected. The number of computers has been raised to 13. No information is yet available regarding the level of its success. These data may be taken as a baseline in the future assessment to see if the expectations have been fulfilled. The faculty's concerns expressed here may be useful in the process planning and review as they can be taken into consideration as well.

4.4.4. Diagnosis and Treatment Planning

Diagnosis and treatment planning are important steps that must be completed before any procedure is performed on the patient. Routinely, patients are screened before they are deemed candidates for being treated by the students and roughly about 60% of patients screened are accepted. The patients who are accepted receive a thorough examination before the treatment plan is finalized and approved. The treatment plan is usually prioritized based on the patient's chief complaint and his or her oral health needs[3]. Faculty members discussed the process of diagnosis and treatment planning at the student clinic. They identified some of the shortcomings in the process. Table 17 presents some of their comments on this matter.

Faculty members recognize that thorough examination of the patient is essential to uncover any hidden disease and ensure the good health and well-being of the patient. Many decisions regarding the treatments to be performed depend on the patients' medical and dental history and general health. This task is carried out at the diagnosis clinic. There is confusion among the faculty members regarding the actual functions of the diagnosis clinic: is it a diagnosis clinic or a screening clinic? As one faculty member said, "what we've got, we've got us an oral diagnosis clinic that actually acts as a screening clinic."

In reality, this diagnosis clinic is the clinical session of the oral medicine (I) course that is given to fourth-year students and is supervised by an oral medicine specialist; and this is how the students perceive it, clinical oral medicine (I). On the other hand, the faculty members seem to perceive the diagnosis clinic as a screening clinic from which patients who are examined are then "referred to the appropriate specialty." They, therefore, condemn the diagnosis clinic as inefficient because the students examine a very limited number of patients in the session: "most students would see one patient per period … per two and a half hours," and as ineffective because "patients are not referred properly from this clinic to the other specialties." In fact, some faculty members reject the decision to make the diagnosis clinic the only point of entry to treatment at the student clinic unless the efficiency and infrastructure of the clinic are substantially improved. Otherwise, they believe, it will be offering the students a very small pool of

[3] Budget is also a factor in prioritizing the treatment plan; but since treatment in the teaching clinic at this school is given free of charge, this factor is not considered in the decision.

patients in which the number of patients examined is far smaller than the number of patients needed by the 250 students who are in training.

This confusion between what *screening* is and what *diagnosis and treatment planning* is was expressed by a faculty member who described the function of the oral diagnosis clinic: "all year long we have a screening clinic whereby throughout the year patients are examined thoroughly by students and then referred to the appropriate specialty"; but then says that "They [patients] get diagnosed [examined] and we give them the proper treatment plan and it is up to the patient whether they want to get the treatment outside the … hospital or inside." In essence, the screening clinic is primarily concerned with recruiting patients to be treated *at* the student clinic *by* the students; but this is not what the diagnosis clinic is meant for here. It is meant for teaching oral medicine to the junior, fourth-year students, hence the confusion.

With this lack of clarity regarding the role of the diagnosis clinic, the process itself does not have a clear objective. What happens after the examination is that if the case is appropriate for the junior student's skill level and the procedural requirements he or she needs to complete, then the student will provide the treatment. But if the case is a mismatch, then the student will not be able to provide the treatment. Thus, the diagnosis session might or might not help the junior students recruit patients. Furthermore, the senior fifth-year students have to recruit patients without the help of the diagnosis clinic. This situation leaves most students with no choice but to look for patients other than those seen in the diagnosis clinic. It is not uncommon to see students looking for patients and patients looking for a student to treat them. In fact, a patient might come to the clinic seeking treatment and meet one of the students who are in session. After a quick look at the condition of the oral cavity, the patient may end up getting treatment. Consequently, patients realize that they can get treatment without having to spend hours in the diagnosis clinic waiting for an extensive and thorough examination that may or may not lead to booking an appointment. The end result is that the patients and the students alike would avoid passing through the diagnosis clinic if they could.

Once a patient starts getting treatment without an approved treatment plan, the relationship is pretty much governed by the patient's chief complaint and the procedural requirements that the student is expected to complete. Usually, once the chief complaint is treated, either the patient discontinues the treatment or the student abandons the patient if none of the patient's needs matches the student's required procedures. Patients do not seem to be comfortable with this situation. As a patient commented, "I suggest giving appointments in advance to make it easier for the student and the patient." A faculty member described the situation with discontent, saying "the students sometimes examine patients in the hallways to decide if they want to treat them or not. This leads to the degradation of the human value, and this has been a long-standing problem in the clinic."

To ease this situation, it is essential that the screening process be separated completely from the diagnosis and treatment planning process. Creating a central patient management system that allows the administration to take the responsibility of screening and assigning patients is the right solution to this problem. This has been implemented recently, and the screening process is now the responsibility of intern dentists, not the students. The students will then focus on creating the appropriate treatment plans for their assigned patients; and that can be completed during the clinical Oral Medicine (I) session.

Table 17: The faculty's input regarding the diagnosis/ screening clinic

Diagnosis and treatment planning	
Concerns for patient's health and wellbeing	"Treatment is not according to a proper treatment plan which may be reflected [negatively] on the patient's own wellbeing" "My concern … is that patients do not receive the proper examination they need. They may get proper examination for their teeth or for their gingival but not for all of the oral cavity; so the patient may have a hidden oral disease and the student may not observe this disease or may skip this examination for the sake of time limitation in order to do the requirements"
Confusion on the actual function of the clinic	"what we've got, we've got us an oral diagnosis clinic that actually acts as a screening clinic" "But most students are just taking it as a diagnosis clinic rather than a screening clinic because there's a seminar part and there's some didactic part" "We call it Clinical Oral Medicine I, and it's taught during first and second semesters to 4th year students" "… in the screening clinic usually it's a staff member from the Oral Surgery department who is mainly focused on Oral Medicine specialty…is the one who is supervising the students" "… year 4 [students] … they are the ones who are screening" "We had a gap in the curriculum in the oral diagnosis clinic. It was only taught to students only in the first semester. So we made a modification to the curriculum so that also it is included in the second semester so that all year long we have a screening clinic whereby throughout the year patients are examined thoroughly by students and then referred to the appropriate specialty"
Inefficiency and ineffectiveness	"But again the patients are not referred properly from this clinic to the other specialties" They [patients] get diagnosed [examined] and we give them the proper treatment plan and it is up to the patient whether they want to get the treatment outside the … hospital or inside… but this should be made more effective screening clinic whereby other specialties … should not take patients who have not been… seen in the screening clinic. "… we cannot make that decision before we improve the efficiency of diagnosis clinic" "…most students would see one patient per period …per two and a half hours, and that's low efficiency; that's very low efficiency. So if we say that you cannot see but the patients we screen, we've really, really, given them [the students] a small pool"
Process and infrastructural issues	"Part of the problem is because we do not have enough patients. Because patients know that they do not have to go through the screening clinic to get to the Cons. So they skip the oral diagnosis clinic" "…the infrastructure of this clinic [diagnosis clinic] should be expanded regarding the staff, the nurses, and the place… so that it will take it crucial role"

4.4.5. Faculty Issues

Faculty related issues were identified in the discussion with the faculty members and in the students' comments. Table 18 presents some of the input given by the two groups on this matter.

The variability in clinical supervisors' experience and expertise is noticeable and affects the instructions they give to students during the clinical sessions, particularly their choice of treatments and the preference of some treatment approaches over others. A faculty member notes that the "the opinions

are sometimes very contradictory," which is confusing to students. Some faculty members believe that "the consistency among clinical supervisors is lacking" and that students "kind of struggle with that." Accordingly, "faculty calibration" is important so that clinical supervisors "get on the same page" regarding the different conceptions and ideas and the different kinds of procedures. What makes this issue even more of a struggle is that "… not every person in the faculty are up to date with current research and recommendations for certain procedures and certain techniques."

Some students would like to see more empathy and responsiveness from their clinical supervisors. A student commented, "I hope professors try to understand the student's situation," while another wrote, "I hope to get more help from professors when I need it." Some students objected to the way they are treated in front of their patients, "… the way the supervising dentist treats us is very bad, especially in front of the patient." Some students noted that the evaluations they receive are subjective or that some supervisors are biased. It is worth pointing out that the student survey shows that students in general appreciate their professors and rated them high on empathy and responsiveness (see section 4.3). So it is likely that these comments may represent isolated cases that are not in line with the general student population. They also indicate that this data is not conclusive on these issues and a more thorough investigation is needed.

Table 18: Identified faculty issues

The faculty members' views	***Diverse experience and expertise***	"Consistency among the supervisors … is lacking. They [students] face lots of problems with the controversy among the instructors… different instructors give them [students] different instructions and they [students] kind of struggle with that" "… the opinions [of faculty members] are sometimes very contradictory" "We have a very important thing missing that is faculty calibration… It's that we don't get calibrated what so ever. I mean everyone comes in with a different experience, with their own set of conceptions and ideas and they just implement it with the students" "We don't have consensus on certain things… we're not on the same page regarding for example different kinds of procedures… we need to get on the same page …" There's a conflict between faculty members on what is the most appropriate treatment for a case. They have different views dependent on their specialties and preferences "I think that we are not bad; we have good expertise all around for sure" "… not every person in the faculty are up to date with current research and recommendations for certain procedures and certain techniques"
The students' views	***Empathy and responsiveness***	"I hope professors try to understand the student's situation and the circumstances he/she could face" "I hope to get more help from professors when I need it" "… the way supervising dentist (professor) treats us is very bad, especially in front of the patient" "The way the faculty members work does not make us comfortable"
	Subjectivity and bias	"Faculty evaluation of students work is often very subjective" "I hope professors are not biased to some students more than others on basis of religion nationality and origin"

4.4.6. Assessment

Assessment is defined as making a judgement about someone's performance using pre-defined criteria (Lake & Ryan 2005). Assessment issues are closely related to faculty as they generally make the assessment decisions. However, I chose to include this topic in a separate theme because of its importance and its particular effect on the quality of teaching and learning. Table 19 presents some of the participants' input regarding this matter.

An important point raised is that the inter-examiner variability, some faculty members believe, exceeds the acceptable limits. A faculty member commented, "The inter-examiner variability 'the Kappa' value should be like between 5% and 10% maximum… it is still huge." And that, it has been said, is after they have "put down the criteria for grading." Nevertheless, grading of clinical work is perceived by some faculty members to be highly subjective and not to have clear standards; rather, it depends largely on the professor's personal judgement. For that reason, it is believed that some faculty members spoil the students with unrealistically high grades on their poorly executed clinical work. Students share this view as well; one student commented that the "faculty evaluation of students' work is often very subjective."

When the grading criteria were discussed, it was clear that they did have a problem implementing a detailed grading criteria rubric. They found upon implementation that the criteria were focused on technical skills but did not include important aspects of clinical work such as the student's effort, the complexity of the case, and the amount of guidance the student needed to complete the task. These factors are considered important and, given the difference in skill level, different expectations are set for the junior and senior students. The approach they took to overcome this difficulty was to define the failing criterion (the D grade, fail or redo) while leaving the allocation of the competence level (C, B, or A; pass, competent or excellent respectively) to the judgement of the supervisor. What this has done is to reduce the grading process into a binary pass-fail scale decision, which means that there will be no dispute regarding a 'fail' job, but there will be variation in the evaluation of the 'non-fail" work as the supervisor chooses between A, B, or C. Note that the pass-fail criteria are focused on the technical skills, while the other elements are left to be assessed at the discretion of the supervisor and affect his or her choice of the competence level. This very well could be the reason that students feel the variation and subjectivity in the evaluation: the wide ranges (C-B-A) within which the faculty could designate a grade to a non-fail work on the basis of ill-defined soft criteria.

Students' work is graded by procedure; every single procedure gets a grade. Accordingly, there are many, many, grades per student, which is time and energy consuming. Faculty members' focus on procedural evaluation was apparent when the potential benefits of the new electronic patient record system were being discussed; their hope was that it will ease the process of procedural evaluation by helping them "keep track of the grades in all the work completed…" This is because, in the discipline-specific

procedural requirements model, the assessment of competence is dependent on the successful completion of the specified number of requirements. This model is known to focus on technical skills above all, which is also the case here; as a faculty member said, "I do not say that how you interact with the patient is not important, no it is important, but at least that the technical part has to be so explicit and clear."

Assessment is particularly important because it is believed that assessment drives learning. Students tend to put much emphasis on the aspects of their learning that will be assessed, especially in high stakes assessments that can make or break one's career. Assessment of clinical performance aims to ensure that students acquire the intended learning outcomes. The learning objectives reflect the competences that the graduate will apply in practice in order to become a proficient practitioner. Epstein & Hundert (2002) define professional competence as "the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individuals and communities being served." Therefore, clinical performance assessment usually involves the assessment of medical knowledge, technical skills, patient care, professionalism, and communication and interpersonal skills. Focusing solely on assessing technical skills denies the students the opportunity to effectively learn the other skills that are important for clinical competence. High inter-examiner variability, on the other hand, and the lack of a clear standard for the assessment of performance fosters mistrust between students and faculty where the latter are perceived by the former as being subjective and biased.

In order for assessment to guide learning, the focus should not be on the assessment criteria only, but also on the *activity* that is being assessed: the unit of assessment. In the comprehensive care model, students are assessed on the basis of cases completed; the case is the unit of assessment. That is not to say that individual procedures are not important, it is just to say that if all the needed treatments for a particular patient are completed to a technical level that is satisfactory and to the satisfaction of the patient, then we know that the student has succeeded in fulfilling his or her responsibility as a care provider. Notice that the soft skills that are difficult to assess in a procedure-by-procedure assessment become more obvious as the student develops the long-term relationship with the patient; then, the student's professionalism, communication skills, punctuality, responsiveness and ethical conduct are all put to the real test.

In fact, unless this paradigm change is realized, there is little chance that any comprehensive care will successfully achieve its objective, simply because the students will look at the comprehensive case as a *bunch of procedures*, not as a *treatment plan*. A student eloquently expressed this idea by saying, "About the comprehensive case: half and half, I treat the required but not all the case!" Consequently, students find that the comprehensive case restricts their liberty in patient selection. A student commented, "The comprehensive case limits the student's option contrary to the idea that he/she treats all types of

cases."

Table 19: Faculty's input on Assessment

Assessment	
Variation among Faculty	"… We did put down the criteria for grading… but still there is lots of variation… Inter examiner variability 'the Kappa' value should be like between 5% and 10% maximum… it is still huge the difference… In order to have consistency you should have [faculty] calibration" There are no clear standards for evaluating the quality of fillings. It is highly subjective and varies depending on the professor's judgement and expertise. Many fillings [completed by students] are given high grades despite their poor execution. Furthermore some Faculty members spoil students with unrealistically high grades on their clinical work.
Focus on technical skills	"…the major problem again is that we use… a special marking [grading] system for students where it concentrates on… mainly the quantity of the [procedures] so… the students [think] that… by gaining a certain number of cases [they] will have better marks [grades]" "I do not say that how you interact with the patient is not important, no it is important, but at least that technical part to be so explicit and clear"
Process related issue	"… in the current system … a supervisor … get them signed up for procedures… there are record [of procedures] in the dispensary and records with them [the students] and they need to get signature on both. That is kind of cumbersome for them"
Criteria for clinical evaluation	"… clinical evaluation is not straight forward, there are multiple factors that goes in between, not only the procedure but also student's effort, difficulty of the case, your guidance… all these things should be included and play a role in the final grade" "…we had for a class one for example it says marginal integrity adequate or inadequate, cavity preparation: caries removal adequate or inadequate etc. We had ten categories… to apply it in reality it does not really work … my idea was … just define that this is what makes you competent, this is what makes you a pass category and so on without having to count the points. Because sometimes it does happen that on paper when you do the grading, yes it was adequate but in the end I went to the seat twenty times for [the student] to finish the task" "… what is looked at in the judgement, if the case is suspicious or if they are beginners (4^{th} year) they can call me 2 or 3 times… but for 5^{th} year no, if they can't diagnose something that is obvious, then that's a problem" "… now, how much 'weight' you will allocate for [independent work]? Then the grade allocation will be too detailed for something that … is obvious" "You worry that students will avoid calling you because they start to think there are grades for working independently" "…now we defined the failure category; that is the critical mistakes. So that if [a student] have any one of these mistakes [will] automatically get the 'redo' that is: Failure or a D. Otherwise the choice between A, B or C" "… make the D obvious, if you do one of those critical mistakes you get a D, but A, B, and C that depends on the whole thing coming together [as judged by the evaluator's opinion]"
Expectations for improvement	"… grading is getting really cumbersome, so we are trying to look for something digital for grading and entry because we in the [department] enter [grades] per procedure we have tons of grades to deal with so I mean if that could be linked to the system it would be perfect" With the new computerized record system, "The faculty member can check and see what requirements the student has completed and what is needed to be done" In the future. "The approval of the requirements will be electronic too" In the future: "You will keep track of the grades in all the work completed. And where are the areas of deficiency in the requirements or may be…"
Other	Regarding theory: (1) all exams are multiple choice questions (MCQ) (2) students' writing is insufficient – students do not write papers or read the literature.

4.4.7. Students' Issues

Students' are considered partners in the learning process. Whatever input they bring with them affects the outcome substantially. In this investigation, some issues related to the students were identified. Table 20 presents some of the participants' input regarding this matter.

Faculty members noted that once the students are in the clinic, they are overly stressed, especially regarding the fulfilment of the requirements. Students also commented on the stress and pressure they feel in their clinical training. A student commented, "As students we face too much stress, too many exams, too many difficulties, and a very long daily working time." Another student requested more freedom for students within the system by commenting, "It must be worked so students' attendance in the clinic and even the lectures is by their own personal choice … reducing the sense of control and authority."

Faculty members noted that "students' efforts are extremely affected by the number of credit hours," so they tend to put in more effort when the course has more weight in terms of the number of credits. They also noted that students vary in terms of their motivation to work and the effort they put into their studies. Furthermore, faculty believe that the students' communication skills need to be improved, especially with patients; as a faculty member commented, "Patient communication is weak in most of students."

4.4.7.1. Selection Criteria

Student admission is a subject that is considered important, especially for a professional programme. In this dental school, there are two paths for student admission, the regular stream, which is subsidized by the government and the admission is based on the high school certificate national exam results. The admission is granted by the Ministry of Higher Education and students compete on the basis of the grades, the higher grade takes precedence. And then there is the parallel stream, which is not subsidized and generally accepts international students or national students whose grades are not competitive within the regular stream. Due to the heavy competition, the students accepted in both streams are the highest achievers, though the parallel stream students are perceived not to be as strong academically as the regular stream students. There is no interview, no admission exam, and no statement of interest is requested from prospective students; the acceptance criteria are grades or financial ability. Faculty members realize that these criteria are limiting in terms of selecting the best candidates for the programmes. They also admit that the policy change is beyond their capacity. It is important, however, to ensure that the level of maturity and readiness of the students on admission is high so that they can achieve the most during their years of study. Input does affect output, especially in the educational process. While the school does not have control over all the policies, there are actions that can help both the students and the school to improve the situation. Some of the ideas that were suggested to guide the prospective students into making an informed decision when they apply include open house, counselling

and orientation sessions. An interview was also considered as very important and should constitute "no less than 40% of the admission decision." The interview, it is believed, "would tell if the students are mature enough for the professional school or not." Because when the student applies for the dental school, he or she should not only think of the title and the social status, he or she must be ready to commit to "a lifelong career."

Table 20: Identified students' issues

Students' Issues		
Faculty's views	***Students attitudes***	"… the quality of the students… some students are really willing to learn … ask questions and [try] to get the biggest advantage of the clinic and some of them are not really that much motivated, especially that the credit hours for our clinic are only 1 hour per semester…" "Student's efforts are extremely affected by number of credit hours"
	Stress	"…once they [students] start the clinic they are so much stressed and their goal … and everything [is] about the number of requirements"
	Communication skills	"I don't know may be this thing has relations to society… our society has a role… [some] students do not know the minimum communication skills: eye contact, facial expressions, gestures are lacking. Some female students, if I talk to her, she is extremely shy that it becomes a problem; I get distracted when I am trying to give her a piece of information, I feel she is not focused with me I become reluctant to communicate. Some students when you talk to them, they give you this poker face… I don't understand, I wonder" "Patient communication is weak in most of students"
	Admission requirements	"[Students] get accepted without being interviewed. I mean you should be interviewed because you are applying for a lifelong career" "… the interview would tell if they are mature enough for professional school or not" "I… go… for having them interviewed for admission… the interview itself should not be less than 40% of [the] admission decision… the rest of it will be your grades, and hopefully we'll get to the stage where we do after high school a dental admission test" "The problem with interviews, frankly, other than the cost is remaining objective… there [will] be other variables… visible or invisible playing a role in the decision, we end up having nepotism and so" "Sure, culturally speaking we do have that [nepotism]" "…it's kind of a much higher decision of how to admit students… but again the burden is on the institution the school of dentistry as an institution to help most of these kids get the transition, it's part of what we teach; we teach lay people to become dentists, and that should be in the system" "The first time the student see a counsellor is when they come in after they are actually admitted; they just pass by… exchange names and greetings but not a formal counselling session"
Students' views		"Too much pressure on the student" "As students we face too much stress, too many exams, too many difficulties, and a very long daily working time" "I hope the psychological pressure [on students] is taken into consideration" "It must be worked so students' attendance in the clinic and even the lectures is by their own personal choice … in reducing the sense of control and authority" "The university must help students in buying dental tools and instruments to help students save money"

4.4.8. Patients' Issues

Some issues related to the patients were also identified. Table 21 presents some of the participants' input on this matter.

Faculty members are generally not pleased with the selection of the patients. Often, the patient has no oral health awareness and lacks interest in oral hygiene. As explained in chapter 3, patients treated at the student clinic are generally those who cannot afford to pay for dental services. As a faculty member commented, "The sorts of patients that come to the clinic are either financially strained or lack dental health awareness or both." While the school can make efforts to improve the patients' oral health and hygiene, the attitude of patients often does not help. Some patients lack commitment to the treatment plan, so they do not respect the appointments. Others realize that the students need them for graduation, so they take advantage; they "'blackmail' the students when they know that they need them for graduation." Both situations are negatively affecting the students' learning experience. Furthermore, a faculty member noted that many patients when they have an unsatisfactory experience, such as when a patient loses a filling because it was poorly done, "patients leave and never come back." Which exacerbates the '*patient problem'* as one student called it. Some faculty members suggested that the "patient must be interviewed at the end of the treatment to rate the student's performance," a suggestion that needs to be taken to heart in any quality improvement effort. Patient satisfaction is a strong indicator of the quality of patient care.

Table 21: Identified patients' issues

Patients' Issues		
Faculty's views	***Patients' Characteristics***	"My concern is patient quality and selection" The issue we have is frankly the type of patients we get and patient selection… not only the oral hygiene is zero, we assume that we are supposed to improve their oral hygiene habits, but also the dental IQ is zero, the dental awareness is zero, interest is zero "…social culture including poor oral hygiene and poor dental attendance" The sorts of patients that come to the clinic are either financially strained (come for free treatment) or lack dental health awareness or both
	Patients attitudes	Some patients 'blackmail' the students when they know that they need them for graduation Patient's attitudes towards oral health, appointments
	Patients' satisfaction	"[When] patients lose fillings because they were poorly done…. many patients leave and never come back" "Patient must be interviewed at the end of the treatment to rate student's performance"
Students' views	***The problem***	It is very, very, difficult to find patients, and when patients are available they do not cooperate

In this section, the eight themes that were extracted by the thematic analysis of the qualitative data were individually described and samples of the data were presented. Faculty, students and patients

identified these issues as having effect on the quality of the learning experience and the quality of services provided at the student clinic. These issues were described only qualitatively and were not quantified, thus the above descriptions do not give more weight or priority to any of the issues over others. Practically, some of these issues have more influence on the quality of the learning experience and the quality of services provided at the student clinic and must be given priority in any action plan. This investigation, however, does not provide this kind of information.

5. Discussion and Conclusions

The Faculty of Dentistry understands the significance of its role as one of the two national schools of dentistry that is expected to: provide the country with a constant supply of competent and qualified dental practitioners to serve the local population; attract foreign students from the neighbouring countries through the parallel admission stream, who, upon graduation, will serve their nations; and foster research and specialty training through several graduate and residency programmes. Aware of the importance of maintaining a competitive edge not only at the national level, but at the regional level as well, QA is at the top of the leadership agenda. The Faculty of Dentistry has actively engaged in several QA activities: at the time this study was conducted, the Faculty was preparing a self-study for a planned site visit by the Association of Dental Education in Europe (ADEE) and the patient management practices were being reviewed with plans to install an electronic patient record system underway. In addition, plans to expand the physical facilities have already been approved. This study complements these QA efforts by conducting an evaluation of the quality of the learning experience and the quality of the services provided in the teaching clinic operated by pre-doctoral students. The quality assessment was carried out by exploring the views of the main stakeholders, the patients, students and faculty members, on several quality dimensions.

Findings showed that the patients were generally satisfied with the services they receive and gave high quality ratings. This can be attributed in part to the fact that the treatment is provided by the students at no cost to their patients. For those patients who could not afford private dental services and/or dental insurance, the student clinic offers them a service that is second to nothing, which they do appreciate. Students and faculty members, on the other hand, were not as satisfied. They identified some challenges that they believe are negatively affecting the quality of learning and the services offered at the student clinic. Analysis of qualitative and quantitative data provided by the three groups of stakeholders show that limited resources, lack of a comprehensive approach to patient care, and substandard patient management practices are recognized as the main challenges to quality improvement in the clinic. At the time, the school was quite aware of these issues and was actually taking actions to improve the situation on these fronts. This investigation confirmed that these are, in fact, serious issues for quality improvement. The study also examined closely the effectiveness of the attempted solutions and the challenges that are encountered.

5.1. Limited Resources

Dental education is one of the most expensive health professions education programmes (Walker, Duley, Beach, Deem, Pileggi, Samet, et al. 2008); limited finances are the status quo in the schools of dentistry worldwide. Teaching clinics operated by the students do not generate sufficient funds to cover their running cost and must be heavily subsidized. It is estimated that the income generated by a pre-

doctoral student clinic covers only about 32% of its running cost (Walker et al., 2008). In this school, however, the student clinic does not generate any income because the treatment is offered to the patients free of charge. This makes the financial situation even more strained since the majority of the total dental school expenditure is related to the operation of the clinical programmes (Bailit et al., 2008), which in this case must be 100% subsidized by other sources such as government funding, tuition fees, extramural income and grants.

The financial strain has also limited the school's ability to sufficiently invest in its physical facilities and in the integration of technology over the past decades, despite the pressing need. The growing number of students and the introduction of specialty training programmes have pushed the expansion of the physical facilities and the integration of technology up the priority list. The approval of the expansion plans has already been granted. It is a given that the initial cost of the establishment of the new facilities is huge and that it will be jointly provided by the institution and the government. The long-term maintenance, however, will be the responsibility of the school. This brings dental school finances to the forefront again: the planned new facilities are almost double the size of the current ones with double the number of dental units, so their running cost will definitely be higher. Furthermore, the increased capacity of the clinic will be associated with a parallel increase in the demand for dental supplies, dental materials, and technical and maintenance support. While similar development projects aim for covering their cost and generating return on investment within few years, dental schools struggle to cover their operational costs. In order to ensure the long-term success of this project, the school must parallel their brick and mortar development plans with a clear and detailed plan for the financial management of the facilities once in operation.

A point that should receive some serious consideration is whether or not they should start charging patients for the services provided by the pre-doctoral students. The questions that must be asked are: Will the school be able to afford functioning with "zero" income from the student clinic? Will the income generated by charging the patients for dental services be worthwhile? And if not, will the other sources of income generate sufficient funds to cover the augmented running cost?

The immediate expectation is that charging patients for services will provide additional income. The decision, however, is not just financial, it is multidimensional and the cost-benefit ratio of such a decision must be assessed rigorously within the context of this school and the society within which it is located and the people it serves. Starting to charge the patients after decades of providing the services for free is a big change that will affect the day-to-day functioning of the clinic. It has some potential benefits, but also risks subjecting the staff and the students to new, unfamiliar challenges.

On one hand, it may repel the patients who are attracted by the free services, further shrinking the already small pool of patients available. On the other hand, it may change the selection of patients by

attracting those who care about oral health enough to pay for dental care, but seek a more affordable alternative to private services. Also, having patients pay for the treatment, even if at a huge discount, would make the clinical training more authentic by resembling the private practice, in which patients' finances are a factor in the treatment planning. This may, however, reduce the frequency of performing certain expensive procedures that are necessary for the clinical training but are avoided by the patients because of the attached cost. The patients may become more demanding and critical of the students' work once they start paying for it. This requires that the students care about the satisfaction of their patients, and not just the grade, which could compel the students to improve their communication skills and establish better relationships with their patients. Dissatisfied patients would be more likely to complain about the unsatisfactory work or come back for a redo of a lost filling instead of just leaving unhappy and never coming back. This may help the school monitor, more credibly, the quality of the students' work by keeping track of the number of patients' complaints and the number of repeated procedures, which are considered reliable measures of the quality of services in a dental clinic. Nevertheless, it becomes essential that the school implements a process to handle the patents' complaints and respond to them. It has been stated that some patients take advantage of the students' needs to finish the requirements; so most students pay for the lab work and, in some occasions, for the patient's transportation. However, when the patient is charged for every procedure, the students may not be able to afford to constantly pay for it, and will learn to be assertive and demand that the patients incur the expenses. This may, however, make the patients' commitment to their appointments subject to their ability to pay, resulting in reduced patient adherence, many lost appointments, and wasted precious clinical time and learning opportunities.

Table 22 summarizes some of the potential benefits and risks of making the decision to charge the patients for the services provided at the student clinic. These are meant to show the complexity of the decision and are not intended to be exhaustive. They also apply to this context in particular because it has been the norm to provide free services for decades, which is not necessarily the case in other dental schools.

Table 22: Potential benefits and risks of charging the patients for students' work

When the patients are required to pay for the services:	
Potential Risks	**Potential Benefits**
- Reduced rates are not cost effective	- Generate income
- Deter patients who cannot afford to pay, shrinking the patient pool	- Appeal to patients who are oral health conscious, improving the selection of patients
- Performing expensive procedures will become less frequent	- Patients are more involved in the treatment planning
- Patients become more demanding and critical	- Compel students to care about patient's satisfaction
- Need a process to handle complaints by dissatisfied patients	- Monitoring the quality of services more accurately
- Patient commitment to their appointments becomes subject of their ability to pay resulting in frequently missed appointment	- Students learn to be assertive in handling finances, improve communication skills and patient relations

5.2. Lack of Comprehensive Care Provision

Upon its establishment in the early 1980s, the school implemented the clinical teaching curriculum that was popular at the time, the discipline-specific procedural requirements curriculum. The 1990s brought change to dental education as the shortcomings of this approach became well known and documented, and the innovative comprehensive care, case completion curriculum was introduced, tried, assessed and deemed a more effective approach to clinical instruction. At that time, however, the school had been rather new and was not ready to embrace such change. Currently, the atmosphere is set for the change. The faculty members are convinced that the current curriculum requires revision as it is not as educationally effective or patient friendly as it could be. In fact, this investigation showed that there is a genuine concern amongst the faculty not just regarding the educational effects, but the moral and ethical effects of this approach, both on the short-term and on the long-term.

Curriculum reform is a long and complex process, and can only be carried out within the strict boundaries imposed by the institutional regulations. Changing the clinical instruction curriculum is even more critical because it involves a transformation of the way the services are provided at the student clinic. This will require redefining the patient selection process, the treatment planning process, the supervision of clinical work, and the assessment of students' performance. However, the most important change that must be achieved in order to succeed in implementing a comprehensive care curriculum is not a process change, it is a paradigm change.

The essence of the comprehensive care curriculum is to foster patient-centred care. If the paradigm shift from student-centred to patient-centred care is not realized, it would not make much difference that the numerical requirements are replaced by a point system, or that a comprehensive case is a graduation requirement, because the students still see them as 'requirements', except that the former are 'point requirements' and the latter are 'point requirements restricted to one subject'. Students must learn to put the patient's needs first because clinical competence is directly related to the quality of patients' care: the quality of their treatment, their health outcomes, and their satisfaction with the experience.

Assessing student's performance on a procedure-by-procedure basis prohibits the students from focusing on the patient's needs by directing the focus to the procedure. It also creates a stressful work atmosphere and a constant sense of urgency because every clinical session is an occasion where the student faces a success-failure situation that is subject to a summative evaluation. Furthermore, it limits assessment to the technical skills, and underrates the other skills necessary for clinical competence such as medical knowledge, patient management, professionalism, and communication and interpersonal skills.

A cornerstone in patient-centred care is that the case is the unit of assessment, not the procedure. As a matter of fact, most dental schools that implement comprehensive care curriculum set a threshold of minimum acceptable requirements that the students must complete. The requirements, however, are

referred to by the number of cases to be completed. Parks' Case Classification System that classifies cases on the basis of the case complexity and the involvement of multidisciplinary learning, and the Case Selection Criteria for the composition of the student's caseload (Parks et al., 2011 and 2012) are useful tools that can help define the minimum clinical requirements in a comprehensive care curriculum and are highly recommended.

The literature shows that the implementation of comprehensive care curriculum is found to be heterogeneous and varies significantly among schools. It is possible to provide care in a hybrid of comprehensive care and discipline-specific clinical settings. It is also possible, and some believe it is more practical, for dental students to provide patient-centred comprehensive care in a discipline-specific clinical setting (Holmes et al. 2003). Patient-centred care can be provided in different settings, as long as the students are encouraged to perform quality patient care and learn the importance of patient management that fosters timeliness and continuity of care. There is high flexibility and ample possibilities for the design of the clinical training that can be fit to any environment and any setting, yet is considered comprehensive and patient-centred. Therefore, the challenge that the school must tackle in switching to comprehensive care, is to find the formula that will work effectively within its specialists-led, departmentally organised student clinic structure.

5.3. Patient Management Issues

The investigation shed the light on some of the issues regarding the current patient management practices at the school. The responsibility of patient recruitment is left entirely to the students. Students see this responsibility as a burden that increases the stress in their clinical training experience; they do ask that the school take this responsibility instead. Both patient screening process and diagnosis and treatment planning process are not well defined, in fact, there is a lot of confusion regarding the role of the diagnosis clinic among the faculty. The lack of a central patient record system inhibits the ability of the different departments to communicate, thus transferring patients among departments is difficult. When a patient is treated in more than one department, there is always a need for a re-examination and history taking, which is considered a waste of resources and precious clinical time. Follow up is very difficult, and there is no mechanism to ensure the timeliness or the continuity of patient care. Furthermore, the students' need to complete the numerical requirements is the driving factor in the student- patient relationship.

The school has recently installed an electronic practice management system designed for use in a teaching setting, and allows the creation of electronic patient records (EPR). Changes to the screening process have also been implemented and the school is now responsible for assigning patients to the students. The expectations are high among the faculty members about these changes, especially the introduction of the EPR.

The EPR is expected to facilitate overseeing work in the clinic and to improve communication between the departments. Patient assignment, patient transfer, and follow up on patients' treatment are expected to become easier. These expectations are justified as these systems have been found to improve schools' ability to fulfill their missions of education and quality patient care, and to be valued tools for quality assurance and quality assessment (Atkinson, Zeller & Shah, 2002; Hill, Stewart and Ash, 2010; Shelley, Johnson & BeGole, 2007; Walji, Taylor, Langabeer II & Valenza, 2009). EPR can be invaluable tool when the comprehensive care curriculum is adopted. Park et al. (2011) listed the many benefits the electronic health records system provided upon the introduction of the comprehensive care model to the Harvard School of Dental Medicine in 2009 (Figure 5).

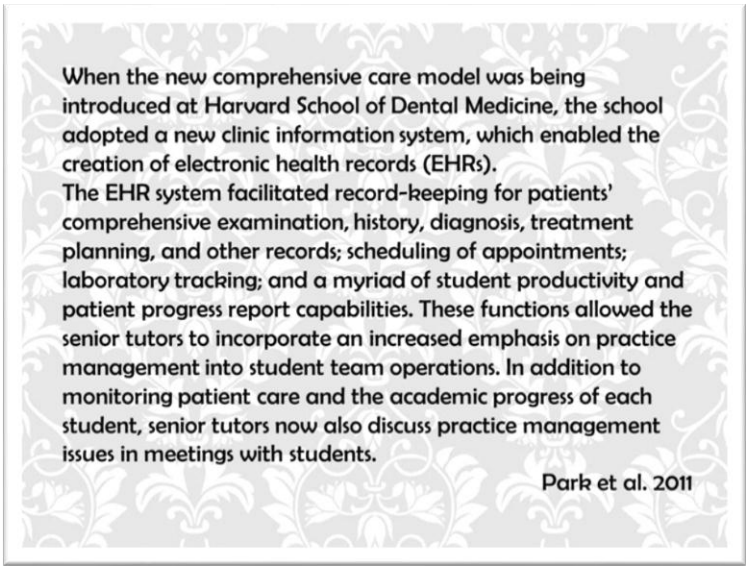

Figure 5: EPR and comprehensive care

The deployment of a new technology, however, carries high initial cost and brings about new challenges. For one thing, the need for training and support of end users can be significant. The need for support may vary among the groups of end users, for example students are found to be more technology savvy than faculty and were more comfortable using it (Hill, 2010). EPR were also found to benefit administrative staff more than clinicians. As a matter of fact, usability issues were found to make documentation cumbersome for clinicians and to cause delays (Hill, 2010). As the school has only recently implemented the system, it is recommended that its short-term and long-term impact is assessed and documented in order to tackle any arising issues early on by taking prompt actions, and to inform and guide the development plans, a major aspect of which is technology integration.

To summarize, this investigation closely examined the view of the patients, students and faculty members on the quality of the learning experience and the quality of services provided at the student clinic. The findings show that the pre-doctoral clinical programme is at the brink of change. The faculty members and the students are ready to embrace the comprehensive care curriculum, which is now considered a benchmark best practice in dental clinical instruction. The patient management practices are sub-standard and the newly installed electronic patient record system is welcomed with big hopes. Scarce resources are still a major issue. Careful financial planning and serious consideration of new sources of

income are necessary to ensure that the school will be able to generate sufficient funds to cover its running expenses especially with huge development plans to expand its facilities are underway.

6. Recommendations

In light of the findings of this investigation, the one recommendation that is believed to substantially improve the quality of clinical training and the quality of services provided at the student clinic is to redesign the clinical instruction to embrace the comprehensive care model. The literature shows that the comprehensive care model is an effective approach to clinical instructions as it fosters patient-centred care, encompasses the different skills that will help the students achieve clinical competence, provides an authentic activity that closely resembles actual practice, and is found to improve students' productivity and learning (see section 2.3.1). In addition, there is a strong support among the faculty for this approach as the data show (see section 4.4.2).

It has been noted that attempts to effectively enhance teaching need to address the system as a whole, not simply add "good" components (Biggs, 1996; Fink, 2003), in order to maintain the focus of faculty, staff and students on the tasks and activities that guide students' development towards the achievement of the desired student outcomes. Planning the clinic's operations based on the comprehensive care model results in a better alignment of the different processes because they will all be centred on comprehensive, patient-driven care. For successful implementation of the comprehensive care model, changes will have to address the system as a whole fostering cooperation among departments and a push towards multi-disciplinary care and the creation of *significant learning experiences*, which is the key to quality in higher educational programmes (Fink, 2003). To achieve that, actions will be required at all levels of responsibility; at the level of the system, the deanship/ leadership, the curriculum committee, the faculty, students and patients.

6.1.1. Actions by the System

To be successful, the plan for the implementation of the new curriculum should encompass all the departments and foster cooperation among the different specialties. The implementation plan needs to take into consideration the current setting of the physical facilities. The availability of the pool area where the majority of the dental units operated by students are located (currently used by the Conservative and Prosthodontics departments) can be effectively used to create a comprehensive care clinical setting. Considering the separate location of the periodontics, orthodontics, paedodontics and oral surgery clinics, which are also distant from the main pool area, a hybrid of comprehensive care and discipline-specific procedural settings can be a practical solution in this particular context. Furthermore, the organisational structure has to be changed: the students grouped into comprehensive care teams and the roles of the teaching staff, generalists and specialists, redefined to support the provision of patient-centred comprehensive care.

The dental school needs to assume the responsibility of recruiting, screening and assigning patients to the students; this can no longer be the students' responsibility. Letting the students recruit their patients, as the data show, is stressful to the students, inefficient and ineffective resulting in many cases in patient selection that negatively impacts the learning experience in the clinic. The electronic patient records (EPR) system is a valuable tool that can be used to facilitate patient management and to monitor and organize activities in the clinic.

Faculty development programs are needed to train the faculty on the effective implementation of the new curriculum and ensure building the needed skills that will help them move steadily up the learning curve.

6.1.2. Actions by the Leadership

In order to become significantly better, the school needs to make fundamental changes to the pre-doctoral program, particularly the clinical training curriculum and the functions at the student clinic. Managing planned change efforts poses a significant challenge to the leadership of the institution. When the transformation requires a paradigm shift that changes the way people think about their work and their mission, the challenge is even higher. Furthermore, effective change can take a considerable length of time; hence the leadership needs to maintain realistic expectations of the pace of change and develop an understanding of the short term and long term implications of such transformations in order to be able to deal with the obstacles and prevent setbacks. On the short term, people may resist changing the work environment because it brings about uncertainty, which breads anxiety and fear of the unknown and reduces autonomy and self-control (McKendall, 1993). Growing resistance may bring the change efforts to a halt. On the long term, unless the change is strongly anchored within the institutional culture, old traditions may creep in causing a slow retreat to old ways and negating the hard-won gains (Kotter, 1995). When successful, transformation can bring growth and prosperity, but the cost of failure can be devastating. Kotter's (1995) eight steps for effective transformation (Figure 6) provide a useful and practical guide for planning and leading the transformation efforts.

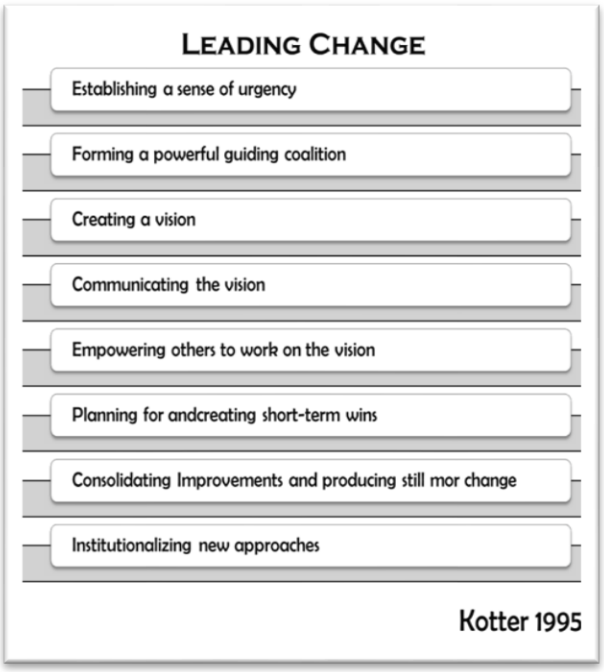

Figure 6: Kotter's 8 steps for leading transformations

According to Kotter (1995), in order for a change to be initiated, there must be a strong sense of

urgency felt for the change. Creating a sense of urgency often requires an honest and frank review of performance: presenting unpleasant facts, identifying pressing issues and discussing problems. However, that is essential because unless at least 75% of the members of the leadership are convinced that the status-quo is unacceptable, change cannot be initiated (Kotter, 1995). This is a situation in which bad news works for the best interest of the institution because in order to remain competitive, an institution needs to recognise what is genuinely working and what is not rather than sugar-coat reality. This study presents many of the issues and problems that faculty, students and patients have identified as impediments to quality improvement. Although the presentation might not give the most polished picture, it is hoped that identifying these issues by the main stakeholders groups would help create the needed urgency for change. Peer feedback by the ADEE accreditation team is also expected to help the school recognise the points of weakness in their program and create a need for change.

Change is usually initiated by one or two people, change agents. It cannot succeed, however, unless they are able to form, over time, a growing powerful guiding coalition that is committed to excellent performance through renewal (Kotter, 1995). A capable and influential guiding coalition needs to be powerful in terms of titles, information and expertise, reputation and relationships. Members of the coalition need to develop a minimum level of trust and be able to communicate outside the boundaries of the formal hierarchy (Kotter, 1995). The seed of a guiding coalition have been forming in this school as many members in the faculty and some students believe that change is necessary. The coalition however is not powerful enough to initiate change. Members of the senior management need to join and support this effort in order for it to be fruitful. Creating a sense of urgency can be helpful in gaining support of the senior management for the change.

The leadership at the school needs to develop a clear vision and a sense of direction for the change. Change efforts usually involve a lot of people; having a clear vision will help the efforts converge. There should be no ambiguity as to what the change effort aims to achieve and in which direction the school is headed. Without a clear vision, the efforts will remain sporadic and will fail to produce noticeable results. On the contrary, failing efforts may strengthen the position of those opposing the change resulting in growing resistance. As this study shows, the school was quite aware of many of the issues and was actually taking actions. The effectiveness of the attempted solutions, however, was limited and many challenges have been encountered. Ambiguity and lack of clear vision can be responsible for the limited success of these efforts. The confusion regarding the role and functions of the diagnosis clinic is one clear example. The clinical diagnosis session was introduced into the curriculum through the daunting process of curriculum change in order to help recruit patients, but instead ended up slowing down the process. It is perceived by the faculty, students and patients as inefficient and ineffective and failed to change the patient recruitment practices.

Communicating the vision so that it is understood by the people affected by the change is essential to reduce confusion, fear of the unknown, and anxiety. Effective communication educates the faculty, students and patients on the new paradigm and shows strong leadership support for the change. One cannot over stress the importance of communication; talking to people and listening to their concerns is essential to maintain support for and reduce resistance to change. It helps identifying obstacles, eliminating time-consuming activities that do not contribute to the realisation of the vision, and identify the areas that need the most support.

Change is a long process that cannot be rushed. Kotter (1995) warns against premature declaration of victory. Premature declaration of victory results in losing momentum and the termination of the change efforts. To avoid terminating the change effort too soon, Kotter (1995) suggests that once the main objectives of the planned change efforts have been achieved, other systems and structures that have not been confronted before are targeted to ensure that they are aligned with the new vision.

In order for change to have lasting effects, the change must be deeply anchored into the culture of the institution; the new paradigm must become *the norm*. It is estimated that five to ten years are required to sink the change deep into the culture of the institution (Kotter, 1995). It is also important that the performance assessment of the faculty and staff is aligned with the new paradigm to avoid the conflict between the realisation of the vision and their own best interest and risk regressing to the old traditions. The newly implemented patient management process, for example, has been successful on the short term: Sufficient sense of urgency has been developed to initiate the change; a motivated and enthusiastic group of faculty members supported by the dean of the faculty led the change; the new process was well communicated to staff, faculty and students using different means of communication: meetings, instruction guide and facebook© group; and sufficient support for the change was rallied. Its success on the long run, however, may be a challenge and requires constant monitoring and enforcement until the old practices are completely gone and the new process becomes the new norm.

Kotter's (1995) eight step process (Figure 6) provide a useful and practical guide for planning and leading the transformations and is highly recommended.

6.1.3. Actions by the Curriculum Committee

The curriculum committee bears a major role in this transformation. Curriculum reform involves making decisions regarding the content of the theoretical as well as the clinical courses. Patient management, clinical reasoning and treatment planning must be included as subjects taught in the curriculum, whether in lectures, seminars, or discussion groups. These subjects will help improve the students' ability to communicate with their patients and carry out the patient management duties effectively. Clinical courses need to be redesigned to allow the students to work in a comprehensive care setting and support building the competencies needed for success in their patient care mission, and

increase patient retention. Clinical activities and the assessment methods must be aligned with the learning objectives to ensure effective teaching through constructive alignment.

6.1.4. Actions by the Faculty

In comprehensive patient-centred care, the patient is considered far more important than any individual procedure; faculty need to set a role model by demonstrating the holistic comprehensive approach to patient care.

The teaching faculty need to modify their teaching and assessment methods to support teaching in a comprehensive care setting; hence the case, not the individual procedure, should be considered the unit of assessment. To achieve that, faculty need to define the patient selection criteria and the case classification scheme; adopting Park's case classification and composition tools is recommended. They also need to educate the patients on the educational nature of the clinic and the importance of their adherence to the treatment plan in order to achieve the learning objectives.

Attending and participating in faculty development programs is essential to ensure that faculty members develop the required skills, establish a common language and set standards and expectations of the new curriculum.

6.1.5. Actions by the Students

In the comprehensive care setting, the student takes care of all the patient's dental care needs. The students assume the responsibility of performing a detailed examination and diagnosis for each assigned patient. They then create the appropriate treatment plan based on the examination findings. Because their performance evaluation is dependent on the completion of the treatment plan, the students become attentive to the satisfaction of their patients.

To succeed in providing comprehensive care, students need to improve their critical thinking, clinical reasoning and patient management skills. They need to develop proper patient communication skills and work on developing long-term relations with their patients. They also need to educate the patients on the educational nature of the clinic and the importance of their adherence to the treatment plan.

6.1.6. Actions by the Patients

The patients need to understand the educational nature of the student clinic. They should be involved in the treatment planning process and approve the treatment plan. They are expected to adhere to the treatment plan to ensure the continuity of services and maintaining the quality of the educational experience.

Table 23 summarises the actions required at each level of responsibility for the successful implementation of comprehensive care curriculum.

Table 23: Actions required at each level of responsibility for the successful implementation of comprehensive care curriculum

Level	Actions required for successful implementation of comprehensive care curriculum
The System	- Plan the curriculum reform - Upgrade patient management practices - Provide faculty development program
Deanship/ Leadership	- Lead the change - Anchor the changes into the culture of the school
The Curriculum Committee	- Make decisions regarding course content - Redesign the clinical training to fit the new paradigm - Align the learning objectives, the clinical activities and the assessment methods to ensure effective teaching through constructive alignment
The Faculty Members	- Set role models for the students - Modify the teaching and assessment methods to fit the new paradigm - Participate in faculty development programs
The Students	- Take care of all the patient's dental care needs - Improve patient management and communication skills - Ensure patient satisfaction
The Patients	- Understand the educational nature of the student clinic - Get involved in the treatment planning process - Adhere to the treatment plan

6.2. Implications for Future Research

Several issues that have direct or indirect effect on the quality of the teaching and learning at the student clinic, and the quality of services provided were raised in this study but were not sufficiently explored. These can be subjects for future investigations and further research. Some of these issues include:

6.2.1. The Admission Criteria

The admission criteria determine the characteristics of the incoming student population. The input highly influences the output, and efforts must be invested to ensure that admitted students are capable of the highest possible achievement within the course of study in the pre-doctoral programme.

Currently, the admission criteria are limited to academic achievement and financial abilities. Dentistry is a health profession, in which a person dedicates his or her life to serving the public: to caring for their patients' oral health and general well-being; ensuring the candidate readiness is essential.

Furthermore, the student body needs to be representative of the general population. Current admission criteria do not ensure this diversity; females, for example, are over-represented at the expense of males, a ratio of 3:1.

6.2.2. Course Design

The design of individual courses is as important as designing the entire curriculum. The constructive alignment between the learning objectives, teaching and learning activities (TLAs) and assessment is essential to create harmony and bridge the gap between the deep and surface learners. It is essential to draw the attention to instructional methods and activities that stimulate learning and replace the traditional methods such as lectures.

Effective course design will assure the alignment between the content taught, the teaching and

learning activities planned, course delivery and assessment. This would help reduce the inconsistency among the faculty and tame the disputes and differences in opinion because it directs the focus to the learning objectives that the students must achieve regardless of the area of expertise or preferences of the faculty.

6.2.3. Inter-examiner Variability

Rating lab and clinical work is regarded as unreliable. Not only different instructors may vary significantly in rating the same work, the same instructor may vary significantly in rating the same work at different times (Sharaf, AbdelAziz and El Meligy, 2007). This problem has been long standing in clinical teaching, and is well documented in the literature. Further research could help determine the extent of this problem at the school and find the most effective ways to reduce or eliminate it.

6.2.4. Assessment

One cannot over emphasize the importance of assessment in education. Effective assessment cannot be limited to make-or-break high stakes exams. Classroom assessment, formative assessment and ungraded feedback are essential to guide learning. There are many different methods that an instructor can use to assess the learning of the students. Unfortunately, many of these methods are not necessarily intuitive and training is necessary in order for them to be used effectively. Faculty development programmes can be helpful in training clinical supervisors to effectively use the different assessment methods.

In the efforts for quality enhancement, it is important to ask the question: *What* do we really need to assess in order to ensure that our learning objectives are being achieved? And then ask the *how* question. A reference to Biggs' (1996) framework for enhancing teaching through constructive alignment is most helpful in this matter, as well as Walvoord and Anderson's (1998) work on establishing criteria and standards for grading in *Effective grading: A tool for learning and assessment.*

6.2.5. Evaluation of the EPR

An evaluation of the effectiveness of the electronic patient record system should be conducted on the short run and on the long run. It is necessary to identify the areas that work well and those that need improvement. This can be useful to better understand the needs, and to guide the development plans.

6.2.6. Quality Assessment

Quality assurance is an on-going activity to ensure the continuous quality improvement. There is direct association between the quality and patient and student satisfaction. The patient satisfaction survey and the student satisfaction survey can be used routinely to monitor the quality of the learning experience and the quality of services in the student clinic. Integration of the student and patient surveys as routine QA activities in the clinic requires further testing and validation of the instruments; exploratory and confirmatory factor analyses are particularly recommended.

6.3. Limitations of this Study

The findings of this study are context specific and cannot be generalized to other contexts. The time constraints forced the convenience sampling approach, and limited the value of inferential analyses; thus the findings are only descriptive in nature. Sample sizes are relatively small and might not be a good representation of the corresponding population; this is particularly true regarding the patient sample.

In the analysis, all the students, those in the fourth year and in fifth year of study were treated as one group. There has been no comparison of the two subgroups despite the qualitative differences in skill level, clinical experience and the clinical training requirements between the senior and junior students. Hence, we do not know if fourth year and fifth year students would rate quality differently because of these differences and in which aspects. Similarly, due to small sample size, there has not been any differentiation in the quality ratings between male and female subgroups.

In the analysis of the patient data, all the patients were treated as one group. Due to small sample size, there has not been any differentiation in the quality ratings between males and females or new and returning patients' subgroups. Larger sample size and random assignment rather than convenience sampling is required for strong and reliable inferential statistical tests.

The student and patient surveys were not pilot-tested, also due in part to time constraints. Future validation of the instruments through exploratory and confirmatory factor analyses is recommended. However, bigger samples are needed to render these statistical procedures reliable.

To conclude this report, the superiority of the comprehensive care curriculum over the traditional discipline-specific procedural requirements curriculum is well documented in the literature. The study shows that many of the issues that impede quality improvement in the student clinic are either direct or indirect consequences of the adoption of the traditional discipline-specific procedural requirements curriculum.

Successful implementation of a comprehensive care curriculum is a major change that will require review and change of the day-to-day functioning of the student clinic. Above all, it requires a paradigm shift among faculty, students and patients towards patient-centred comprehensive care. The rewards are however worthwhile as this approach is currently considered a benchmark best practice in dental clinical training. Some of the factors that can potentially facilitate the change are the strong leadership support, the readiness to embrace the change, and the newly installed EPR system.

Finances remain a challenge and the school is encouraged to consider alternative sources of income to continue to cover its operational costs and be able to invest in educational resources and physical facilities.

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Appendices

Appendix I

The Patient Survey

Age: _____

Gender: (1) Male _____ (2) Female _____

Are you (1) New patient _____ (2) Returning patient _____

	Strongly Agree									**Strongly Disagree**
Tangibles										
1- The dental clinics has modern looking equipment	9	8	7	6	5	4	3	2	1	0
2-The dental clinics physical facilities are clean and visually appealing	9	8	7	6	5	4	3	2	1	0
Employees										
3- Employees at the clinic give you individual attention	9	8	7	6	5	4	3	2	1	0
4- Employees in the clinics are always willing to help you	9	8	7	6	5	4	3	2	1	0
5- Employees in the clinics has your best interest at heart	9	8	7	6	5	4	3	2	1	0
6- Employees in the clinic are never too busy to respond to your request.	9	8	7	6	5	4	3	2	1	0
Appointments										
7- You only come to the clinic when you had an urgent problem.	9	8	7	6	5	4	3	2	1	0
8- The clinic has operating hours convenient to you	9	8	7	6	5	4	3	2	1	0
9- You found someone to treat you the first time you came to the clinics.	9	8	7	6	5	4	3	2	1	0
10-It was easy for you to find a student interested in treating you.	9	8	7	6	5	4	3	2	1	0
11-You come to all appointments with the same student till treatment is completed.	9	8	7	6	5	4	3	2	1	0
12-You have to constantly look for another student to treat you	9	8	7	6	5	4	3	2	1	0
Students										
13-The dental student looks and behaves like a professional	9	8	7	6	5	4	3	2	1	0
14-The student is always respectful and courteous with you.	9	8	7	6	5	4	3	2	1	0
15-Students have the knowledge to answer your questions.	9	8	7	6	5	4	3	2	1	0
16-Students look like they know what they are doing.	9	8	7	6	5	4	3	2	1	0
17-Treatment is performed correctly, you never needed to repeat the procedure	9	8	7	6	5	4	3	2	1	0
18-You feel safe in your treatment session.	9	8	7	6	5	4	3	2	1	0
In General…										
19- You are satisfied with the quality of service you received in the students' clinics.	9	8	7	6	5	4	3	2	1	0
20- You are satisfied with the treatment the student provided and happy with the results.	9	8	7	6	5	4	3	2	1	0

Comments

_____

_____

Thank you!

Appendix II

The Student Survey

Gender: (1) Male _____ (2) Female _____

Year of Study: (1) 4th year _____ (2) 5Th year _____

ID:

	Strongly Agree									Strongly Disagree
Tangibles										
1- The dental clinics has modern equipment	9	8	7	6	5	4	3	2	1	0
2- The dental clinics are well maintained	9	8	7	6	5	4	3	2	1	0
3- You are provided with all the tools and dental materials you need	9	8	7	6	5	4	3	2	1	0
Faculty										
4- Faculty members at the clinic give you individual attention	9	8	7	6	5	4	3	2	1	0
5- Faculty members at the clinics are always willing to help you	9	8	7	6	5	4	3	2	1	0
6- Faculty members at the clinics have your best interest at heart	9	8	7	6	5	4	3	2	1	0
7- Faculty members at the clinic are never too busy to answer your questions	9	8	7	6	5	4	3	2	1	0
8- Faculty members have the knowledge and experience to answer your questions	9	8	7	6	5	4	3	2	1	0
Patient Management										
9- The clinic has operating hours that are convenient to your patients	9	8	7	6	5	4	3	2	1	0
10- Patients always respect their appointments	9	8	7	6	5	4	3	2	1	0
11- It is easy for you to find a patient to treat	9	8	7	6	5	4	3	2	1	0
12- It is easy to transfer the patient to be treated by another student	9	8	7	6	5	4	3	2	1	0
13- It is easy to transfer the patient to be treated in another department	9	8	7	6	5	4	3	2	1	0
Treatment Planning										
14- You plan treatment based on the patients' complaints and needs.	9	8	7	6	5	4	3	2	1	0
15- You plan treatment based on the course requirements you need to complete	9	8	7	6	5	4	3	2	1	0
16- You agree to treat a patient only if what they need is also the course requirement you have to complete	9	8	7	6	5	4	3	2	1	0
17- You usually plan to treat your patients in different departments	9	8	7	6	5	4	3	2	1	0
18- You usually have difficulty keeping the same patient for multiple treatments	9	8	7	6	5	4	3	2	1	0
In General…										
19- You are satisfied with the services provided to the patients in the clinic	9	8	7	6	5	4	3	2	1	0
20- You are satisfied with the learning experience you have in the clinic	9	8	7	6	5	4	3	2	1	0
21- You feel confident that what you learn in the clinic will be applied in your practice	9	8	7	6	5	4	3	2	1	0
22- You feel confident that you will graduate as a competent dentist	9	8	7	6	5	4	3	2	1	0

23- You are required to complete a comprehensive case: (1) Yes _____ (2) No _____

24- Do you believe that you will manage to complete the comprehensive case in time for graduation?
(1) Yes _____ (2) No _____ (3) N/A _____

Comments

_____

_____

Thank You!

Appendix III

The Focus Group Discussion

The discussion was focused on trying to answer these questions regarding clinical teaching and patient management at the students' dental clinics:

Issues and Concerns

1- What are your concerns regarding the quality of clinical teaching at the students' clinic?
2- In your opinion: What are the main problems that students face? How do they affect their learning?

Patient Management System

Many solutions have been proposed, attempted and implemented to solve the patient management problem. The level of success these solutions endured vary, but was generally marginal.

3- In your view: What are the reasons that hinder successful implementation of an effective patient management system?
4- In your opinion: What makes an effective solution? Why?