

Dental Students' Views of Their Clinical Cognitive Skills. A Qualitative study

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Abstract

Introduction: Clinical skills involve students' cognitive and technical skills, which represents the essential aspects of professional competency. Clinical skills' development was a focus of many recent studies.

Previously conducted studies showed that undergraduate dental students have more interest toward developing their technical clinical skills, which include simple and complicated dental extractions, rather than developing cognitive skills. However, to the best of the author's knowledge no previously conducted qualitative study to understand students' perception of their cognitive clinical skills. **Materials and methods:** This focus group study was conducted in Almustansiryah College of Dentistry. The study sample was nine students. Six students were fifth year students, and three were fourth year students. Focus group discussion was conducted using a set of open-ended questions based on previous study and the author's 10 year clinical teaching experience. The model on which the discussions were made was Patient Information Sheet of Oral Surgery Department. **Results:** Reaching diagnosis and making logical treatment decision in the used patient information sheet model, as perceived by students, seem to be a daunting process. The study showed that students have three overlapping views regarding diagnosis and treatment planning items, importance contradict, ambiguity, and deterrence. There are no clear-cut boundaries between these aspects, as important aspects for some participants still ambiguous for others. Ambiguous items is considered by some students consider them as deterrent items. **Conclusions:** Undergraduate dental students seem to have critical awareness toward the diagnostic and treatment planning process, which might indicate that students have interest to develop their clinical cognitive skills. However, the pressure of time with the clinical requirement appears to drive students to give more emphasis on technical skills.

Keywords: qualitative research, framework approach, students' clinical cognitive skills, oral surgery.

Introduction

Clinical skills' development is an important part of dental education (Manakil and George, 2011). Clinical skills involve students' cognitive and technical skills, which represents the essential aspects of professional competency (Murinson et al., 2008). Competency based evaluation has the advantage of active student participation in

problem solving and encouragement of critical assessment (Yip and Smales, 2000). Clinical cognitive skills mainly include proper clinical judgement, error detection and proper decision making (Kohls-Gatzoulis et al., 2004). As far as surgical training is concerned, clinical training includes three consecutive stages: technical, combined technical and cognitive, and cognitive skills (Khan et al., 2005). It has been assumed that undergraduate students show more emphasis on technical surgical skills. Khan et al (2005) stated that technical skill development is the main area of learning for undergraduate students, whereas combination of cognitive and technical skills is developed in junior practitioners.

Dental students start their clinical training during the last three years of study in Iraqi Dental Schools. These skills, however, start to develop during the first three years of study in dental school (Albino et al., 2008). Clinical skills' development was a focus of many recent studies (Henzi et al., 2005; Pales et al., 2015), with particular interest in students' perception in addition to teachers' perceptions toward technical teaching (Schonwetter et al., 2006; Groenuld and Handal, 2013; Bernardo et al., 2014).

A previously conducted studies by (Alhamdani et al., 2015) (Ansary et al., 2011) showed that undergraduate dental students have more interest toward developing their technical clinical skills, which include simple and complicated dental extractions, rather than developing cognitive skills.

However, to the best of the author's knowledge no previously conducted qualitative study to understand students' perception of their cognitive clinical skills.

Aim of the study: To explore students' views of their clinical cognitive abilities.

Materials and Methods

Ethical approval for this study was provided by Almustansiriyah Scientific Committee 2/2015. The study was conducted by the end of 2014-2015 academic year. Nine students agreed to participate and included in a focus group discussion (Powell and Single, 1996). Six students were fifth year students, and three were fourth year students. These students were informed about the study purpose, design, and their identity will be confidential. They have been informed that they have the right to withdraw from the study any time before, during, or after the study. Three of the participant students were fifth year female students. The choice of students based on the level of their marks in oral surgery, which was different and diverse (very good, good, intermediate, acceptable).

The choice for the selected participants' sample based on they are from the same dental college. Better interaction and comfortable discussions can be achieved when participants are familiar with each other and share the same environment (Powell and Single, 1996; Gill et al., 2008). The minimum case requirement for final exam entry in oral surgery is 15 dental extraction cases for the fourth year, whereas the minimum entry requirement for the fifth year is 15 dental extraction cases with five minor surgical procedures, as a surgical assistant.

Focus group discussion was conducted using a set of open ended questions based on previous study (Alhamdani et al., 2015) and the author's 10 year clinical teaching experience. The model on which the discussions were made was Patient Information Sheet of Oral Surgery Department. Oral Surgery Case Sheet represents the most

comprehensive case sheet in Iraqi Dental Schools. It has 56 items (questions) covering current and past dental history, medical history, family history, habits, as well as both extra and intra oral examinations.

The interview, which was moderated by the researcher, took place in Lecture Hall 1 in the College of Dentistry, Almustansiryah University. The focus group discussion lasted for 47 minutes. The data was digitally recorded and transcribed verbatim by the researcher. The focus group discussion was in Arabic language, Iraqi accent. In between Arabic words, students used English scientific terms as the teaching language in Iraqi dental schools is English language. The researcher was aware of his authoritative position that might influence the outcome of the study. However, he ensured a friendly discussions environment within the focus group and encouraged each voice to be expressed freely. This, as the researcher believes, could minimise the bias in data collection and data analysis. The author translated the above-mentioned scientific terms within the Arabic text to make the language flow smoothly. Data was anonymised, as participant's name was replaced by a number.

The methodology adopted in this study is a generic qualitative approach (Rapley, 2010; Snape and Spencer, 2010). This approach cuts across the most basic terms shared by different methodological approaches. This means the start with close inspection of particular dataset with line by line coding. Framework method for data analysis was adopted in this study. Data was organised case by case and theme by theme (Ritchie et al., 2004). Framework approach provides systematic and explicit way for qualitative data handling, which enhances rigorous analysis with credible findings (Smith and Jill Firth RGN, 2011). Constant Comparative Method was broadly employed to discover, explore and explain the underlying patterns (Rapley, 2010). pattern was tested several times as the researcher revisited the data (Strauss and Corbin, 1990).

Results

Cognitive skills in terms of reaching diagnosis and making logical treatment decision as perceived by students seem to be a daunting process. This is expressed by students through the fact that Oral Surgery Case Sheet is lengthy. The students' view of the case sheet in general is related to the number and nature of case sheet items. Students' views of these items can be included under three overlapping areas: importance, ambiguity, and deterrence. There are no clear-cut boundaries between these areas, as important aspects for some participants still ambiguous for others. This ambiguity of some items may reach to the level makes some students consider them as deterrent items (Figure 1).

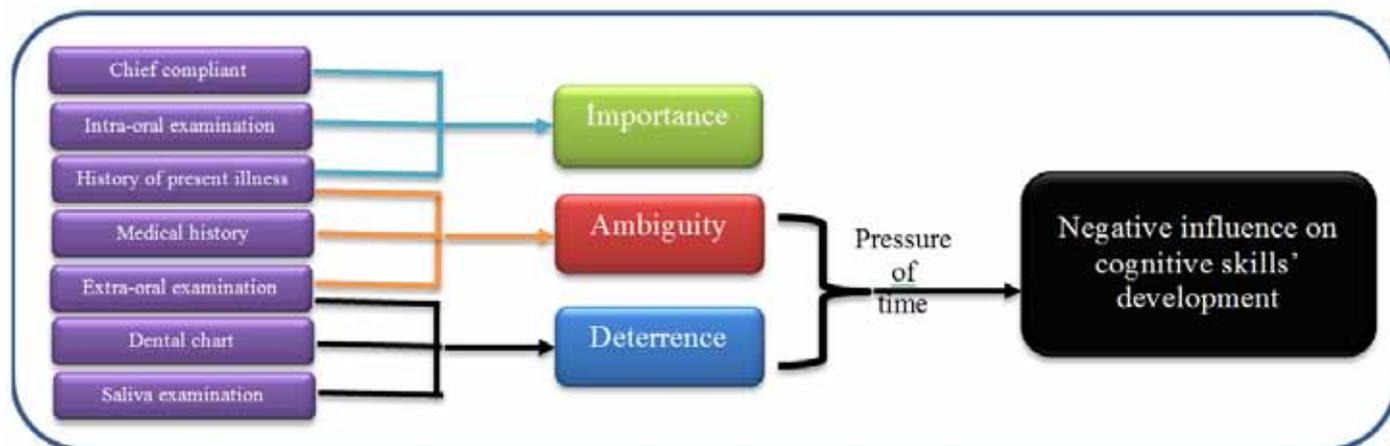


Figure 1: Study theoretical constructs (ver.7).

Lengthy and detailed diagnosis and treatment planning process (pressure of time)

As a general agreement, the diagnosis and related treatment planning process in the chosen model (usually termed Oral Surgery Case Sheet) appears to be long, which seem to reflect that following the required steps represents a heavy task.

“Oral surgery case sheet is lengthy” (Participant No.4, 5th year student).

There were different explanations provided by the students about their feeling toward the case sheet. The first one was the discrepancy between what they need to know in order to treat the cases they receive in the Oral Surgery Department and the size of information they should provide during case sheet filling. Oral surgery clinic for the students is mostly a dental extraction clinic. The majority of referred cases from other departments are cases with limited diagnostic options. The vast majority of received cases are referred for extraction of teeth with periapical pathosis or irreversible pulpitis, retained roots, and much less cases are referred for orthodontic reasons. For these reasons, some students’ notion that the case sheet does not provide what it has designed for.

“The problem is with cases we receive in oral surgery. The diagnosis around such cases is almost known, either pulpitis or periapical lesion. There are no cases such as tumors or lesion where lymph node examination is useful. We do not see such cases which are the common cases, and the diagnosis is easy. In addition these cases are referred from diagnostic department” (Participant No.5, 5th year student).

“The case sheet has little to help me to reach the diagnosis” (Participant No.1, 5th year student).

However, not all students find the nature of case sheet questions contradict with dental extraction procedures usually performed in Oral Surgery Clinic.

“We don't feel any discrepancy between the case sheet as surgical case sheet and the fact we perform dental extraction mostly” (Participant No.9, 4th year student).

“I disagree with my colleague’s opinion. Despite oral surgery case sheet is lengthy, it

is better to keep it as it is" (Participant No.4, 5th year student).

The burden of the number of cases students have to treat within the academic year appears to be one of the reasons for them to consider OSCS lengthy. Time factor plays a role in students' opinion about oral surgery case sheet. There is a pressure of meeting clinical requirement within the academic year.

"The reason we neglect filling all necessary information is we are committed to a requirement. We are in a race. Since we have requirement we are in a race" (Participant No.5, 5th year student).

However, there are students who disagree and think that adequate attention should be paid to the patients and it is not acceptable to consider the pressure of time and requirement as excuses for such negligence of documentation.

"I disagree with my colleague about the time factor. We are dealing with a patient" (Participant No.9, 4th year student).

Another reason could be the comparison students make between oral surgery case sheet and case sheets used in other departments. The following quotes reflect the need to consider time factor and the need for better focus in case sheet questions.

"4th year perio case sheet is a comfortable case sheet. Operative case sheet is the most comfortable one, because it can be filled fast. Time factor is important because we have limited time" (Participant No.4, 5th year student).

"Perio case sheet is comfortable case sheet. It is focused and organised, Perio case sheet is the most useful case sheet, because it gives reference to the change after treatment, whether the treatment is right or wrong " (Participant No.5, 5th year student).

Despite that comprehensiveness of oral surgery case sheet was the centre of students' complaint, they prefer Oral Surgery Case Sheet over other case sheets as a sample case sheet in their future dental clinics.

"I choose oral surgery case sheet in my clinic. It is useful in case of emergency" (Participant No. 9, 4th year student).

Importance

Importance refers to the role of information to achieve proper treatment decision. Questions about patient's chief complaint (CC) and history of present illness (HPI) seem to be an area of agreement between participants concerning diagnosis.

"Oral surgery case sheet is useful in diagnosis but not all the questions. CC and HPI are helpful in reaching the diagnosis. Other questions are useful in case if emergency happens" (Participant No.9, 4th year student).

"Only the first two questions are useful: CC and HPI, in addition to clinical examination. The other information did not help me to reach the diagnosis" (Participant No.1, 5th year student).

Students acknowledged the importance of medical history in terms of emergency management and its medicolegal implication. There are students who suggested putting a field for patient's signature. Other suggested documenting the time of treatment for this purpose.

"Once I started filling the case sheet I felt the patient might be lying or not clear about his general condition. If anything happens we have no evidence the patient did not provide the information about his health. There must be a field where the patient

should sign or even use finger print, if he is illiterate" (Participant No.3, 5th year student).

"We need the patient to sign on the case sheet and record not only the date but the time of starting of treatment. If death happen, what proves I did what and when patient signature and mentioning time? We should add the time of beginning and finishing of treatment" (Participant No.7, 4th year student).

However, students did not think medical history is relevant to diagnosis. These items are relevant in terms of emergency management. Students did not consider the fact that some general medical conditions might be reflected in the oral cavity and might influence treatment. Investigations, which are mainly periapical radiographs have been mentioned by some participants as useful diagnostic aids.

"CC, HPI and investigation are more important than medical history questions" (Participant No. 5, 5th year student).

The students viewed the importance of medical history from the angle of protection against contagious diseases, which could be transmitted to the student.

"Once a patient did not tell me about his jaundice, but I noticed his sclera was yellow. He admit later he has hepatitis" (Participant No.7, 4th year student).

Ambiguity

Ambiguity refers to the information items, which represent area of disagreement between students regarding the proper treatment decision making. This reflects some students' view of the included items in this category are not clear or do not really appear to be relevant to proper treatment outcome. It seems that the case sheet complexity and layout has its influence on students' view of it. This could explain why some students consider OSCS vague, not direct, confusing or not straightforward.

"Strange feeling [toward the case sheet] because information is not what really you look for. You feel that the questions are not clear or direct enough. I think the oral surgery case sheet needs to be re-written. The language is dry" (Participant No.6, 5th year student).

Ambiguity refers to questionable items from students' perspectives. It has been shown in the previous section that students acknowledge the importance of some case sheet items, such as history of present illness (HPI). However, they still feel that this item further needs to be clarified and specified for proper information registration and improve diagnostic process. This is the case for other case sheet items.

"HPI need to be specified and divided, also we need to specify whether it is a tooth or root to start with" (Participant 1, 5th year).

"We can increase the usefulness of diagnosis by making the question of HPI more than one, for example for pain: severity...etc." (Participant No.9, 4th year student).

"I prefer using a chart where possible diagnosis is listed in chart for example acute pulpitis, or periapical lesion instead of the chart for filled, missing teeth" (Participant No.6, 5th year student).

Another questionable item is medical history. Medical history in oral surgery case sheet shows obvious area of debate in terms of its role in the case sheet or in terms of its comprehensiveness. The quotes below reflect the thinking range about the case sheet, which seem to be confined to the medical history. The first view considers the

aim of case sheet is, mainly, to know the patient medical condition. The other view acknowledges that medical history was mentioned to tackle medical emergencies could occur during treatment.

"It [case sheet] helps us to know the patient [medical] condition and treat the patient accordingly" (Participant No.3, 5th year student).

"[the aim of the case sheet is] student protection in case of emergency" (Participant No.7, 4th year student).

Some students believe medical history is unnecessarily detailed compared to other case sheets, whereas others find this comprehensiveness is useful to overcome emergency conditions might occur during surgical treatment.

"Perio case sheet is not as comprehensive as oral surgery in terms of medical history, because oral surgery has a system review, whereas perio is just like operative. It has just one question, which we keep it in heart: how is your health and what medication you are taking?" (Participant No.1, 5th year student).

Extraoral examination is another questionable item in terms of its relevance to diagnosis. Some students believe that some questions in extra oral examination are useful, others believe they are not.

"Lymph node and extraoral examination is useful in 10%. Extraoral examination was useful in case of TMJ; I don't see the extraoral examination is important. It wasn't useful for me" (Participant No.4, 5th year student).

Deterrence

Deterrence refers to the steps in the diagnosis and treatment planning information sheet as redundant. As shown in the previous section. There might be some items in the chosen information sheet model, which represent areas of debate between students in OSCS. These items, such as extra oral examination, according to the occasional need to perform them, which is why they are considered as unnecessary by participants.

However, it seems there is general agreement about the redundancy of the dental chart. Dental chart is comprehensive dental examination chart for filled crowned, missing and replaced teeth. It includes a table for carious, filled and missing teeth. In addition, it documents the presence of bridges or other dental prosthesis. Another part of the chart is a dental arch drawing, which the student can mark what is missing from the dental arch. For oral surgical cases, most students agreed that it is not relevant and it is time consuming.

"The dental chart is redundant." (Participant No.4, 5th year student).

"For the dental chart is not useful for cases in oral surgery department, whereas for dental clinic it is useful for dental record for the dentist, or for institutional purpose, but for this particular case it is not useful for us" (Participant No.1, 5th year student).

"Tooth charting is not useful. The decision whether to extract a tooth is not necessarily related to other teeth, because we don't extract a tooth unless it is hopeless. Presence of many filled teeth is not really important because the condition of the tooth to be extracted is what matters" (Participant No.3, 5th year student).

"Tooth charting is not really related to diagnosis" (Participant No.6, 5th year student).

As far as clinical examination is concerned, there are some items where students used to ignore. These items are extraoral examination and examination of saliva.

"About clinical examination, there are many questions which are not addressed by students, such as saliva consistency" (Participant No.1, 5th year students).

"I did not use it [extraoral examination] in reaching diagnosis" (Participant No.3, 5th year student).

Discussion

Cognitively skilled medical trainees, certainly have better chance in reaching accurate diagnosis. This largely influence their clinical skills, which in turn will shapes the treatment outcome (Murinson et al., 2008).

Undergraduate students are more inclined to develop their technical skills. However, this does not preclude the fact that students are aware of the usefulness of their cognitive skills' development. Data analysis showed that students are developing their cognitive skills through their critical views toward the diagnosis process. Critical thinking is an integral part of clinical cognitive skills (ADEA, 2016).

Participants in this focus group study were enthusiastic to share their views of process of diagnosis and related ability to make accurate clinical decision. Students, as data shows, appear to be aware of the medicolegal aspect of diagnostic process. They are also aware of particular importance of some items in patient's information sheet in reaching the diagnosis.

The participants' judgement on the items' importance appear to be related to their relevance to diagnosis. Participants agreed that CC and HPI are more important in reaching diagnosis in addition to intraoral examination. This fact has been acknowledged by other studies (Gruppen et al., 1988; Peterson et al., 1992; Tsukamoto et al., 2012). However, this seems to contradict the finding of the previously conducted study by the author and his colleagues, which showed lack of interest in documentation of HPI field (Alhamdani et al., 2015). This negligence, as mentioned by some students, was related to the need to detail and specify HPI. This might explain the position of this item in the overlapping area between importance and ambiguous themes.

Medical history was the area of debate between students. This is due to the difference in their angles of view. Students do feel this item useful from the medicolegal aspect and the need of medical history to manage emergency conditions. Nevertheless, students seem to compare between the detailed systems' review in medical history section, in Oral Surgery information Sheet, and how briefly provided in Periodontology and Conservative Departments. Despite the consensus about the general outline of patient information sheet for surgical patients, there are different case sheet formats adopted by different textbooks (Moore, 2011; Mitchell, 2015b).

Patient information sheet model chosen for this study has detailed system review in medical history section. Detailed system review adds complex demand due to the required medical and dental knowledge (Kadagad and Kotrashetti, 2013). In medical history taking, not all systems require the same attention for every particular case. Cardiovascular and respiratory systems need to be considered with particular interest for all surgical patients (Mitchell, 2007). Making system review less of a burden on dental students could be addressed by over emphasis on direct and indirect effects

each system could have on dental management. This might move this item from ambiguity area to importance area.

Extraoral examination is often found by many students as not essential and can be reduced into one general question instead of number of questions, which often found by students irrelevant in many cases. This agrees with the notion that clinical examination should be tailored according to patient's general health and the nature of the surgical procedure (Mitchell, 2015b). The same applies for saliva examination, which is another item considered by students as irrelevant item. In absence of salivary gland problems it is difficult to assess salivary flow on clinical basis alone (Mitchell, 2015a). All students agreed that dental chart for caries, filling, and missing teeth was irrelevant item. In fact this screening was not an important element case sheets as provided by oral surgery textbooks (Hupp, 2008; Malik, 2012). Participants in this study agreed, on different level, that the chosen patient information sheet model needs to be revised. This reflects their cognitive awareness, despite there are some authors think this might be early to accomplish during this period (Khan et al., 2005). This awareness needs to be encouraged. It is important to create the sound foundation for cognitive skills during this stage of learning. In dental education, oral surgery in particular, integration of theory and practice is essential (Fugill, 2005; Kaslow et al., 2007). One of the objectives of undergraduate oral surgery training is to be competent in obtaining detailed dental history (Macluskey et al., 2008; Straub-Morarend et al., 2013). Clinical data gathering is a key element in clinical competence (Gruppen et al., 1993).

Both cognitive and psychomotor skills should be acquired by undergraduate dental students during their clinical practice (Bernardo et al., 2014). However, it is not always an easy task to implement theoretical and applied knowledge in clinical teaching environment (Groenuld and Handal, 2013) stressful and complex clinical encounter might drive student's focus more toward technical skills.

This study finding might also reflect a problem in clinical teaching process in this particular area. This problem lies in teaching students how to address each aspect of patient information sheet efficiently. Clinical environment is a stressful multitask environment. This multitask nature involves acquiring knowledge during performing clinical procedures, interactions with the patients, dental staff and fellow students. In another word, it involves effective integration of theoretical knowledge and technical skills in addition to understanding ethical and legal aspects of management (Fugill, 2005; Kaslow et al., 2007; Murinson et al., 2008).

The burdens of clinical requirement students need to endure within busy time schedule appear as an important aspect of students' cognitive attitude. Clinical requirement as mentioned by student put students under stress. This has been acknowledged by other studies (Morse and Dravo, 2007; Mikolajczyk et al., 2008). In fact, the clinical training environment is one of the factors make level of stress felt by dental students is higher than stress felt by their fellow medical students (Murphy et al., 2009). It has been acknowledged that stress, in general could negatively influence dental students' performance (Sanders and Lushington, 2002). Clinical education in dental schools is a challenging environment for both students and tutors (Gerzina et al., 2005; Hudson and Ratnapalan, 2014). This mandates continuous assessment for teaching process to optimise students' performance and reduce the burden of stress of clinical environ-

ment (Taleghani et al., 2004; Al-Sowygh, 2013; Alhamdani et al., 2015). On the basis of this study finding, it would be useful to reconsider the way of clinical teaching method by eliminating the time stress. This might allow clinical cognitive skills to develop alongside technical skills in the same level of emphasis. Practical skills can be improved throughout the early-supervised practice in the first training year after graduation. Clinical cognitive skills, on the other hand, might not get the same chance of development. In addition, it would be beneficial for the clinical trainer to perform patient management as a demonstration in front of students. This would further minimise error in both diagnostic process and extraction procedure (Banda et al., 2013).

Implementation of this study finding within dental education in Iraq should be considered within the context of re-evaluating their misconception toward students' clinical skills' development. More time can be given for students to give more attention toward their cognitive skills side by side with their technical skills development. This can be achieved by focusing more on the quality of cases treated by students rather than the quantity. This would reduce the stress of time. Marks may be given for the accuracy of diagnostic procedure.

The researcher understands that the research problem might be limited to a certain clinical teaching environment, which might limit the transferability of the study findings. However, this study sheds a light on an important aspect of clinical dental education. It is important to enable students to engage more with patient's information through simple direct relevant questions to what they practice in a particular clinic.

Conclusions

Undergraduate dental students seem to have critical awareness toward the diagnostic and treatment planning process, which might indicate that students have interest to develop their clinical cognitive skills. However, the pressure of time with the clinical requirement appears to drive students to give more emphasis on technical skills.

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