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# Assessment of Self Perception of Competencies among a Group of Dental interns in Pondicherry, India

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## Abstract:

**CONTEXT:** The general dentist must not only have a broad biomedical and clinical education but also be able to demonstrate professional and ethical behavior as well as effective communication and interpersonal skills. In addition he or she must have the ability to evaluate and utilize emerging technologies, continuing professional development opportunities, and problem-solving and critical thinking skills to effectively address current and future issues in health care. But the extent to which the core competencies are taught and the students' level of proficiency in these competencies in Indian scenario is to be explored at large.

**AIMS:** The present study aims at assessing the self-perceived level of competencies and their importance for future practice and the extent to which the competencies are taught in the curriculum among interns of dental college in Pondicherry, India.

**SETTINGS AND DESIGN:** The cross-sectional observational study was conducted among dental interns of Indira Gandhi Institute of Dental Sciences, Pondicherry.

**SUBJECTS AND METHODS:** A total of 72 interns participated in the study. A short version of the Freiburg Questionnaire to Assess Competencies in Medicine" was used in this study. Questionnaire has three sections with same set of questions, which the student had to rate: (i) To what extent do you have the following competencies at your disposal? (ii) To what extent will your future job require the following competencies? and (iii) To what extent is competencies taught to you? After the results were obtained a focused group discussion with the responders was done. Focused group discussion consisted of open questions to the groups in all the four domains and the responses of the students were scribed.

**RESULTS:** In all four domains, self-perceived level of competency was not satisfactory. However, all students stated that the competencies were highly relevant for their future practice. Despite this, most of the competencies are not taught to necessary extent in the curriculum. The results of the present survey revealed that the participating students perceived deficiencies in all domains of competencies.

**CONCLUSIONS:** These results indicate that the core competencies are still barely integrated into dental curricula and that further research in this field is needed.

## Keywords:

Communication and interpersonal skills, competency-based education, dental students, Freiburg Competencies Questionnaire, professional attitudes, self-perception

## Introduction

From the middle of 20<sup>th</sup> century, it has been widely accepted that education system should be evaluated in terms of

outcomes which will indirectly reflect on the teaching and learning process.<sup>[1]</sup> Acquiring competencies to manage a professional situation is considered the most important outcome in this regard.<sup>[2]</sup> Current and future health challenges demand new and

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changing competencies to form the basis for education and training development and workforce planning.

“Competencies are skills essential to beginning the practice of dentistry and allied dental practice. Competencies combine appropriate supporting knowledge and professional attitudes, and they are performed reliably in natural settings without assistance.”<sup>[3]</sup> The accreditation standards for dental education were changed in 1997 to require a competency-based approach, with the following definition: “Competent: The levels of knowledge, skills, and values required by the new graduate to begin independent, unsupervised dental practice.”<sup>[4]</sup>

Competency-based education has been used in medical education for more than a decade. The concept was introduced in dental education in 1993 in Chambers’s article “Toward a Competency-Based Curriculum” and a plenary session at the annual meeting of the American Dental Education Association (ADEA) featuring an exploration of the potential impact of competency on various aspects of education in the profession.<sup>[3,5]</sup>

A competent workforce with the necessary knowledge, skills, and abilities to translate policy and current research into effective action is vital for the future growth and development of health promotion.<sup>[6]</sup> The general dentist must have a broad biomedical and clinical education and be able to demonstrate professional and ethical behavior as well as effective communication and interpersonal skills. In addition, he or she must have the ability to evaluate and utilize emerging technologies, continuing professional development opportunities, and problem-solving and critical thinking skills to effectively address current and future issues in health care.<sup>[7]</sup>

Numerous definitions exist with regard to medical competencies. However, the one by Epstein and Hundert is more acceptable. They defined medical competencies 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 individual and community being served.<sup>[8]</sup> This definition emphasizes that in medical practice competencies manifest themselves in various ways mostly without conscious reflection.

The CanMEDS-Project of the Royal College of Physicians and Surgeons of Canada is probably the best known example for competency based education. This framework conceptualizes the professional activities of physicians as seven roles that allow the definition of respective competencies and obligations.<sup>[9]</sup> Based on this, a questionnaire to assess these competencies, the “Freiburg Questionnaire to Assess Competencies

in Medicine” was framed in The Freiburg institute, Deutschland, Germany.

In lieu with the above, this study was initiated to assess the self-perceived level of competencies among the interns of Indira Gandhi Institute of Dental Sciences (IGIDS) in the following four domains: communicative competence, team competence, learning competence, and scholarship. Comparison of the self-perception of competencies with the perceived importance of the competencies for future practice and to the extent which the competencies have been taught was also done.

## Subjects and Methods

The present survey was conducted in IGIDS, Pondicherry. A total of 72 interns, who were to complete their under graduation in the academic year 2017–2018, were selected to participate in the survey. The study was approved by the institutional ethical committee. The questionnaire was administered to the students after informed consent. The questionnaire was developed as online Google Forms for ease of filling and analysis. The questionnaire was administered through link sent to a Whatsapp group. Demographic details such as age and sex was collected, and in addition, their area of interest was assessed (whether academics or clinical practice or research).

The questionnaire chosen was a short version of the Freiburg Questionnaire to Assess Competencies in Medicine (FCM questionnaire).<sup>[10,11]</sup> The questionnaire contains a total of 17 items in four domains: communicative competence (eight items), team competence (three items), learning competence (five items) and scholarship (four items). The domains of competencies are listed in Table 1 with corresponding sample items. The questionnaire is given in Table 1.

Each item had to be rated thrice. The questionnaire has three sections with same set of questions, which the student had to rate: (i) To what extent do you have the following competencies at your disposal? (ii) To what extent will your future job require the following competencies? and (iii) To what extent is the competencies taught to you? Each item was scored from 1 to 5: (i) To what extent do you have the following competencies at your disposal? (1 – Not competent and 5 – Highly competent), (ii) To what extent will your future job require the following competencies? (1 – Not relevant and 5 – Highly relevant), and (iii) To what extent is the competencies taught to you? (1 – Not taught and 5 – Always taught).

All the 72 interns were willing to participate in the survey. Only interns present at that day at that time

**Table 1: FMC questionnaire**

Competencies questions	Self perception (Score between 1-5), where 1 - Not competent 5 - Highly competent	Extent of importance for future practice (Score between 1-5), where 1 - Not relevant 5 - Highly relevant	Whether it is taught or not (Score between 1-5), where 1 - Not taught 5 - Always taught
Communication competence			
Explaining the basic medical principles of treatment to the patient			
Basic questioning techniques			
Having patient centered attitude and communication skill			
Involving patients in deciding the treatment			
Conversing with patient at their level of understanding			
Identifying nonverbal aspects of communication			
Dealing with challenging clinical situation using suitable communication strategies			
Team competence			
Considering people and opinion from different specialties in decision making			
Understanding my position in a dental team			
Working with a interprofessional team			
Learning competence			
Identifying gaps in my knowledge			
Identifying gaps in my practical performance			
Learning from my mistakes			
Scholarship			
Analyzing scientific information to answer a scientific question			
Searching and using available scientific information in deciding a treatment			
Creating study design and methodology to conduct a research			
Explaining and practicing legal and ethical issues			

FMC = Freiburg Questionnaire to Assess Competencies in Medicine

were included and all were asked to fill the questionnaire without consulting others to minimize the peer influence in answering the questions. Similarly the part, to whether the skills were taught or not was asked to fill first followed by what is their perceived level of competence to eliminate the effect the latter will have on the first part.

The interns were collected at one place for 30 min, made to feel at ease and the purpose of the study and its significance and the method of filing the questionnaire was explained in detail. In addition each item was also explained both in instructional and native language for better understanding. Assurance that the main purpose of the study was to improve further training based on their feedback and not to be anyway judgmental about them was given. An anonymous feedback option was

given, but majority chose to give names. After the preparatory instructions, the students were requested to fill the online survey.

Responses in each item and domain were represented as means and standard deviation. The maximum score for each item will be five and the minimum score will be one. In each item, the self-perception of the students, the level of importance of each competency, and whether it is taught or not will be analyzed.

After the results were obtained a focused group discussion with the responders was done. For this, purposive sampling with five overall positive responders and ten negative responders to the self-perception of competencies were chosen, as more responses were

toward not competent side and we wanted to know the reason behind that. Focused group discussion consisted of open questions to the groups in all the four domains and the responses of the students were scribed.

### Results

Response rate was 100%. A total of 72 interns filled the questionnaire. There were 22 male and 50 female responders. The average age was 22.15 years. Mean and standard deviation was calculated for each response in all the three sections. The means and standard deviation for each item in all the three sections is depicted in Table 2.

On analysis of overall response for the communication competencies, the self-perception was  $3.26 \pm 1.04$  which was toward competent. The importance to future practice was  $4.74 \pm 0.06$  and the extent to which it was taught was  $3.02 \pm 1.01$  [Figure 1].

On focused group discussion, the students felt that among communicative competencies, involving patients in decision process and identifying nonverbal aspects of communication needed more training. Especially identifying nonverbal aspects of communication as dentistry involves working on the patient’s mouth, and this skill becomes very important as the patient might not be able to talk during the procedures.

On analysis of overall response for the team competencies, the self-perception was  $2.04 \pm 0.22$  which was toward competent. The importance to future practice was  $4.7 \pm 0.02$  and the extent to which it was taught was  $1.83 \pm 0.18$  [Figure 2].

On focused group discussion, for the item considering people and opinion from different specialties in decision making, the students reported that they have seen faculty taking opinion from other departments, but they are not trained to do so. In fact, they revealed that the treatment to be done is said to them directly while allotting the case and they are not involved in treatment planning process. When considering the item working with an interprofessional team, they reported that they have not even seen faculty work as an interprofessional team. Patients are treated under departmental silos. This reveals lack of horizontal integration during teaching years.

On analysis of overall response for the learning competencies, the self-perception was  $2.2 \pm 0.06$  which was toward competent. The importance to future practice was  $4.76 \pm 0.07$  and the extent to which it was taught was  $1.87 \pm 0.10$  [Figure 3].

On focused group discussion, the students revealed that this component of competency was not taught at all. This

**Table 2: Complete response represented as means and standard deviation for each item in all the three sections**

Competencies questiona	Self perception	Importance for future practice	Taught in curriculum
<b>Communicative competence</b>			
Explaining the basic medical principles of treatment to the patient	4.04±0.84	4.79±0.57	4.06±0.82
Basic questioning techniques	4.16±0.70	4.70±0.81	3.98±0.88
Having patient-centered attitude and communication skill	4.13±0.80	4.79±0.71	3.54±0.18
Involving patients in deciding the treatment	2.61±1.32	4.65±0.80	2.22±1.22
Conversing with patient at their level of understanding	4.05±0.97	4.83±0.58	3.70±1.06
Identifying nonverbal aspects of communication	2.13±1.25	4.75±0.68	1.80±1.06
Dealing with challenging clinical situation using suitable communication strategies	2.16±1.33	4.73±0.62	1.86±1.31
<b>Team competence</b>			
Considering people and opinion from different specialties in decision making	2.15±1.34	4.70±0.72	2.05±1.49
Understanding my position in a dental team	2.20±1.54	4.68±0.63	1.73±1.20
Working with a interprofessional team	1.98±1.32	4.73±0.69	1.72±1.23
<b>Learning competence</b>			
Identifying gaps in my knowledge	2.15±1.43	4.69±0.72	1.77±1.29
Identifying gaps in my practical performance	2.18±1.46	4.75±0.64	1.88±1.40
Learning from my mistakes	2.27±1.62	4.84±0.54	1.98±1.43
<b>Scholarship</b>			
Analyzing scientific information to answer a scientific question	2.05±1.41	4.66±0.82	1.79±1.26
Searching and using available scientific information in deciding a treatment	2.12±1.46	4.62±0.79	1.84±1.31
Creating study design and methodology to conduct a research	3.30±0.91	4.40±1.07	3.26±1.27
Explaining and practicing legal and ethical issues	3.58±0.97	4.89±0.59	3.55±1.13

shows lacunae in training the students for continuing education. This learning competency is very essential for introspecting and utilizing experiences to enhance personal and professional growth.

On analysis of overall response for the scholarship competencies, the self-perception was  $2.83 \pm 0.88$  which was toward competent. The importance to future practice was  $4.65 \pm 20$  and the extent to which it was taught was  $2.61 \pm 0.92$  [Figure 4].

On focused group discussion, analyzing scientific information to answer a scientific question and searching and using available scientific information in deciding a treatment was not taught to them. Evidence-based practice is not generally part of undergraduate dental curriculum in India, whereas its practiced in most of the European countries.<sup>[11]</sup> But when it comes to creating study design and methodology to conduct a research and explaining and practicing legal and ethical issues, the students perception of competency is near fully competent as a simple small research project is part of their curriculum in Public Health dentistry department and ethics is taught as a separate topic in public health dentistry department and the topic is taught through lectures.

For individual items such as explaining the basic medical principles of treatment to the patient, basic questioning techniques, having patient-centered attitude and communication skill, and conversing with patient at their level of understanding the student were more confident about these competencies, as they were taught to them as part of history recording at various departments starting from general medicine, general surgery to all the dental departments. The same concepts are repeated at different points that might have acted as a reinforcing factor for these competencies.

However, other skills such as involving patients in deciding the treatment, identifying nonverbal aspects of communication, and dealing with challenging clinical situation using suitable communication strategies, the students rated that they were more toward not competent. Moreover, these skills were also not taught to them sufficiently. These are the skills that are highlighted as important competencies as part of communication skills as well as professionalism.

## Discussion

This study reveals that the students' rating of their current level of competence in the questioned domains differed significantly from the level of competence that students think is required by their job. In all domains, students rated their current level of competence

significantly lower compared to the presumed level of competencies demanded by their job.

The overall rating for communication competencies, on comparing the self-perceived levels of competency versus importance for their future practice, their competence was less ( $3.26 \pm 1.04$  vs.  $4.74 \pm 0.06$ ). When assessing the self-perceived level of competencies and whether the competency was taught or not, a significant correlation was observed ( $3.26 \pm 1.04$  vs.  $3.02 \pm 1.01$ ) [Figure 1].

Similar results were obtained by Bitter *et al.* among dental students in Germany.<sup>[11]</sup> Another survey by Schönwetter *et al.*<sup>[12]</sup> also found that communication skills were not taught much among dental undergraduate students. Graduates from a dental school in Canada felt that effective interpersonal communication skills were one of the most valued competencies. The presumed level of communicative competence demanded by the future job was also rated very high.

Teaching of communication skills must start even before students start interacting with patients on clinical postings. Similarly, dealing with challenging clinical situation using suitable communication strategies is very important skill when it comes to patient management. But in most if the situations, the faculty takes over the situation, giving students no chance and exposure as how to manage such cases. A module on communication skills is a necessary part of curriculum in the 3<sup>rd</sup> clinical year. The knowledge, observation, simulation and experience (KOSE) model is very easy to adopt. It includes four components: KOSE. In KOSE, students acquire knowledge about effective clinician patient communication, observe faculty demonstration of skills, practice in a simulated environment, and then hone their communication skills through real patient experiences.<sup>[13]</sup> The Knowledge, Observation, and Simulation components can occur in the 2<sup>nd</sup> year of dental school, and Experience can occur during 3<sup>rd</sup>-year clinical work.

As suggested by various competency frameworks, team competency approach should form an integral part of the dental curriculum and should begin during undergraduate dental education. The overall team competence as perceived by students was very less as compared to what they taught about its importance for future practice ( $2.04 \pm 0.22$  vs.  $4.70 \pm 0.02$ ). When perceived level of competence was compared with whether it was taught, there was direct correlation ( $2.04 \pm 0.22$  vs.  $1.83 \pm 0.18$ ) [Figure 2].

This results support a study by Bitter *et al.*, where in German students, the rating of the self-assessed current

team competence of the participating dental students that was significantly lower compared to the presumed level of competencies demanded by their job later on.<sup>[10]</sup> However, a study in Canadian dental students revealed more positive results for team competence.<sup>[12]</sup> ADEA survey of competencies also revealed similar results.<sup>[14]</sup>

This competency is essential, as they learn complexities and integrities of treatment planning. The beginning of final clinical year would be the ideal time to bring in the team competencies, as they would have familiarized with basics of treating patient by the 3<sup>rd</sup> year. In Germany, working in pairs as operator and assistant for patient treatment in the last 2 years of the dental curriculum is suggested as means to improve the team competence. Pairing has been considered as a strategy to promote soft skills among dental students.<sup>[15]</sup>

Using standardized patients will be best to train students in this skill. Interprofessional and interdepartmental collaborative practices can be taught with various patient situations.<sup>[16]</sup> Clinics concept can also be brought into the curriculum, where the student is allotted his own space and patients. He has to treat the patient comprehensively, and whenever required consult specialist for proper treatment of the patient. This concept can be best brought in during the internship, in the comprehensive clinic department, as part of training for starting their own practice as majority of the dentals students opt for starting their own clinic once they complete. At the end, the skill can be assessed by direct observation of practical skill, multisource feedback, and self-reflections.

Lifelong learner committed to continuous improvement of skills and knowledge is identified as important competency in numerous competency frameworks. It is also one of the important components of Vision 2015. Looking into the learning competencies, this also was perceived less as compared to demanded by practice later on ( $2.2 \pm 0.06$  vs.  $4.76 \pm 0.07$ ). The level of competence correlated with whether the competency was taught or not ( $2.2 \pm 0.06$  vs.  $1.87 \pm 0.10$ ) [Figure 3].

In a study conducted among Brazilian students, the results showed that the students revealed less leadership and management qualities.<sup>[17]</sup> Abbas *et al.* also found that relatively little emphasis is given to leadership and management in medical curricula. However, students recognize a need to develop leadership and management competences.<sup>[18]</sup>

It is not acceptable to assume yesterday's knowledge can meet the present-day demands. Knowledge updating involves both the theoretical and practical aspect so that the dentist could provide a standard of care consistent

with what it expected in the profession. Hence, the foundation for lifelong learning should be established in the dental schools, and its importance must be inculcated into students so that they are prepared to face the dentistry of tomorrow. This can be brought in during their internship period.<sup>[19]</sup> The students can be asked to be a part of postgraduate seminars and journal clubs. They can be asked analyze and present one journal and one seminar per posting. Each student can prepare and present a small portion of a common topic and the same can be evaluated. Scientific debates will also be an interesting method to inculcate learning competencies in the students.

On assessing scholarship competencies, the overall rate for self-perception was lesser than the overall rating for importance in future practices ( $2.83 \pm 0.88$  vs.  $4.65 \pm 0.20$ ). Like with other competencies, the self-perception was in accordance with whether the skills were taught or not ( $2.83 \pm 0.88$  vs.  $2.61 \pm 0.92$ ) [Figure 4].

In a survey among Canadian dental students and in ADEA survey, similar results were found. In both the survey, the evaluation and utilization of the scientific literature were rated least important in the contribution to the students' dental career. This rating might indicate that the domain scholarship is often less important for students and for lecturers in a rather practical-orientated dental curriculum. A study on German students by Bitter *et al.* showed only small difference between the presumed level of competencies demanded by the job and the rating of the current level of competency.<sup>[10]</sup>

Evidence-based practice should be part of every dental curriculum, as it is the basis of treatment today. Various methods of teaching evidence-based dentistry is practiced by different schools.<sup>[20-22]</sup> A simple and feasible model is as follows: evidence-based dentistry can be spread across the last 2 years of dental curriculum. In the final year, the concept of evidence-based dentistry, formulating a clinically answerable question and searching for evidence can be introduced. This can be in form of interactive lectures and practice sessions. Following this, in each department, they can take up one clinical situation frame a question and collect evidence. In internship, modules on practice of critical appraisal of evidence and clinical application of the evidence in practice can be brought in this can be taught using small group discussions followed by presentation by each group at the end. This whole process can be taken as part of formative assessment.

The strengths of the study are a simplified version of Freiburg Questionnaire which is more suitable for Indian students is used and focused group discussion to identify the reason behind the responses was done that had not been done in a previous similar study .

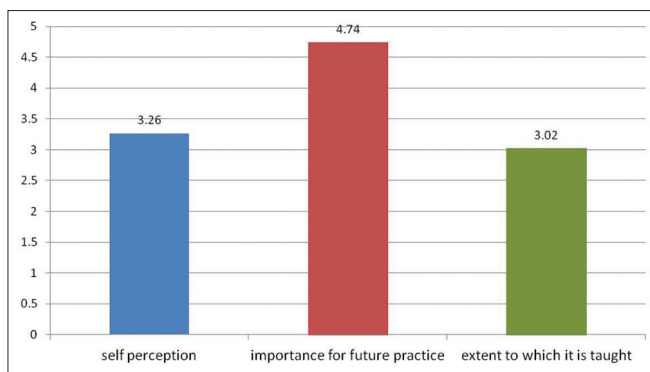


Figure 1: Overall representation of the communication competencies

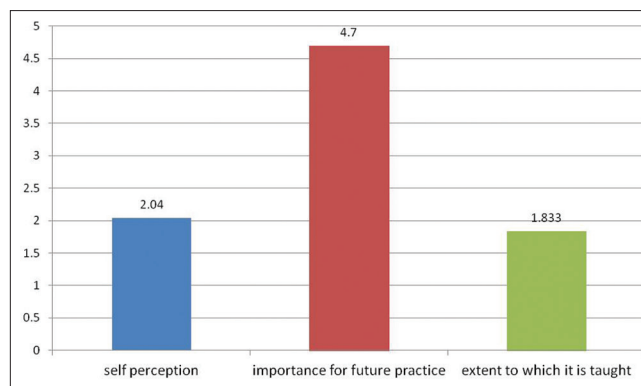


Figure 2: Overall representation of the team competencies

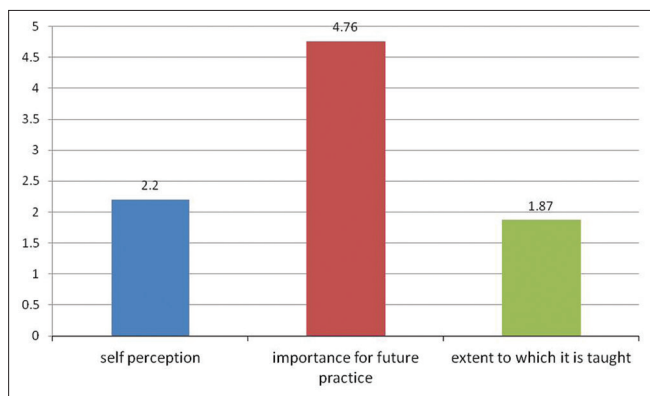


Figure 3: Overall representation of the learning competencies

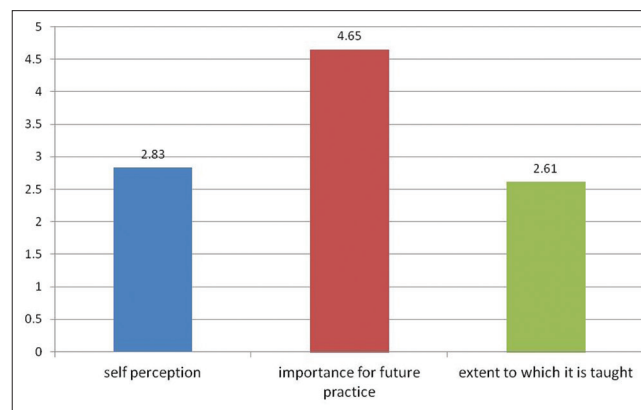


Figure 4: Overall representation of the scholarship competencies

Limitations of the study are: small sample size, chances of recall bias and self-rated levels of competencies do not necessarily reflect real competencies. No evidence exists that those students who rated themselves as competent are really competent in the questioned domains. This has to be taken into consideration when interpreting the present results and self-assessment along with objective assessment by Objective Structured Clinical Examination/Objective Structured Practical Examination (OSCE/OSPE) would have been a better objective way of confirming the responses.

Based on the results of the study, we would like to suggest following recommendations in the curriculum:

- To teach communication competencies, incorporate a module in beginning of the 3<sup>rd</sup> clinical year – KOSE model
- For teaching team competencies a module can be introduced at beginning of the final clinical year – pairing, comprehensive clinic model, etc.
- Learning competencies can be taught by including a module in internship – seminars, journal clubs, scientific debates
- Scholarship training can be spread across the second and third years (concept of evidence-based dentistry, formulating a clinically answerable question and searching for evidence) and fourth year (practice of

critical appraisal of evidence, applying, and analyzing the practice).

## Conclusions

The present survey reveals that dental students themselves rated the assessed domains of competencies, that is team competence, communicative competence, learning competence, and scholarship deficiently compared to the presumed requirements in their job later on. The present study indicates the deficiencies in the current taught dental curriculum, and the results demonstrated that the assessed domains are probably not integrated enough into dental medicine curricula.

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## Conflicts of interest

There are no conflicts of interest.

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