

Professional Skills Evaluation in Dental Education

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Abstract

Background: The objective of this study was to evaluate undergraduate dental student's perception about professional skills.

Methodology: This research used the dynamic mixed method. This study was completed in approximately one year. Total 208 participants were included through the purposive method. Thematic analysis was done for the qualitative analysis, and IBM SPSS version 26 software was used for the quantitative analysis. Themes and subthemes were generated through coding. A P-value of ≤ 0.05 was set for statistical significance. Frequencies of assessment of professional skills were calculated.

Results: Analysis shows that in 208 dental students' responses, 63% agreed that their instructors taught them professional skills. However, when we considered the evaluation of professional skills, the responses were flip side. The overall frequency of students' responses showed that there is less evaluation of the professional skills of undergraduate dental students. Themes and codes generated related to the evaluation of professional skills are factors that increase the performance of students, measures to improve professional skills, factors that improve the evaluation system, and factors that improve the development and evaluation of professional skills at the institutional level.

Conclusions: Teaching professional skills are part of the curriculum in the present era. Institutes are teaching professional skills while not evaluating these skills. There is a requirement for improvement in the evaluation system of professional skills of undergraduate dental students.

Keywords: Curriculum, dental students, evaluation, patient care, professional skills

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Introduction:

Professional skills are abilities and competencies necessary for success in the workplace.¹ Hard skills are specific technical abilities, such as project management, are required to perform a job.² On the other hand, soft skills and interpersonal abilities enable people to work effectively with others, such as in communication, problem-solving, and leadership.³ Developing and refining professional skills can help individuals excel in their current roles and prepare them for future career opportunities.⁴

Professional skills are tremendously significant for teaching dental students at the undergraduate level. Their performance at the dental clinics can decide whether they succeed or fail as professional dentists. This is essential because institutes want to see zealous students passionate about their dental profession and progress in their skills.⁵ A highly standardized dental education includes skills like teamwork, moral ethics, self-determination,

entrepreneurship, internal motivation, critical thinking, problem-solving, and adaptability.⁶ The professional skills mention how the individuals plan and organize their work to complete tasks efficiently and on time.⁷

The professional skills need evaluation to frame the skills and allow learners and instructors to be involved in finding solutions. The needs evaluation clarifies problems, sets aims for future achievements, and justifies decision-making for learners and instructors.⁸ It is important for them to learn responsibilities, the capabilities necessary to fulfill those responsibilities, and the training to become competent.⁹

Dental clinical skills, compassion, competency, and professionalism are all required to make your name in the market.¹⁰ Students must see their peers making sound, professional decisions in their actions.¹¹ A supportive institutional culture is essential in teaching professional skills.¹²

There needs to be more connection between the theory and practice of professional skills in our healthcare professionals. Certain fundamental traits should be taught at the undergraduate level.¹³ The importance of professional skills in dentistry has been well documented in the literature, but the question arises of applying the need evaluation method.⁸ Assess undergraduate dental students' professional skills as a resource to determine educational needs through formative feedback.¹⁴

The rationale of this study is that undergraduate dental students should be evaluated, institutes should take measures to improve the student's professional skills and improves the evaluation system for this.

Methodology:

This research used the dynamic mixed method. 208 participants of dental students from first to final years were included through the purposive method. This methodology allows targeted sampling and enhances representation and applicability; however, it efficiently focuses resources on relevant individuals or groups. It leverages expertise, promotes diversity, and suits our research by selecting participants based on enriching insights and understanding. Participation was entirely voluntary. Questionnaire was formed through the literature review and validated by three experts. Questionnaire was validated and reliability was analyzed. For developing questionnaire, defined the objectives, conducted a literature review, and consulted the expert for their opinions. Experts validated the questionnaire through assessing questions cover all relevant aspects clearly and confirmed if the questionnaire accurately measures the intended concept. Generated initial items based on research and refined through pilot testing and item analysis was done before the circulation of the questionnaire among the targeted population. Validated with 25 samples and ensured the reliability, followed by thorough documentation for transparency. The questions in the pilot study having Cronbach's alpha less than 0.60 were omitted

from the questionnaire. Quantitative questions were closed ended and qualitative questions were open ended. Questionnaires were distributed in every class during their lecture timings after taking permission from the head of departments. Qualitative data was collected through paper survey method and responses were typed on the NVIVO 12 and then thematic analysis was done on NVIVO 12. We coded the data, developed themes, refined them, and interpreted the findings. Inter-rater reliability was tested and this assessed consistency via coding, agreement calculation, discrepancy resolution, reassessment, and reported for rigorous analysis. IBM SPSS version 26 software was used for the quantitative analysis and Chi square test was used. Themes and subthemes were generated through coding. A P-value of ≤ 0.05 was set for statistical significance. Frequencies of evaluation of professional skills were calculated. Undergraduate dental students from first to final year were selected to include in the study. Students who were not available during the questionnaire's distribution and unwilling to fill it out were excluded from the study. Approval was obtained from the Ethical Review Committee of CMH LMC & IOD Reference no: .664/ERC/CMH/LMC dated 10th January 2022.

Results:

Quantitative Analysis

Total 63% agreed that their instructors taught them professional skills. As shown in Table 1 and Figure 1 quantitative part of the research, majority of students think that professional and moral ethic were taught to them by their facilitator while entrepreneurship is the least taught skill. However, when we consider the evaluation of professional skills, the responses were flip side. The overall frequency of students' responses showed that there is less evaluation of the professional skills of undergraduate dental students. Themes and codes generated related to the evaluation of professional skills are factors that increase the performance of students, measures to improve professional skills, and factors that improve the evaluation system.

Table 1 Quantitative Analysis: Assessment of Professional Skills

Assessment of	Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %	P Value
Communication Skills	7	17	23	43	11	.000
Patient Handling	9	17	26	35	12	.000
Leadership Skills	6	9	24	46	16	.000
Teamwork	7	14	24	43	11	.000
Professional moral and ethics	4	9	16	51	19	.000
Self determination	5	18	27	36	13	.000
Entrepreneurship	6	21	28	32	13	.000
Internal Motivation	7	18	22	40	13	.000
Critical Thinking	7	15	26	41	10	.000
Problem Solving Skills	5	17	24	44	11	.000
Skills of Adaptability	6	13	27	44	10	.000

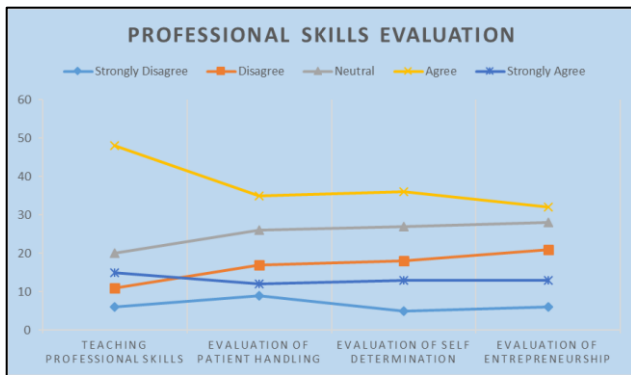


Figure 1: Illustrates frequency of perception of undergraduate students about professional skills evaluation.

Qualitative Analysis

The following themes and subthemes were generated as shown in Table 2 and Figure 2.

Factors to increase the performance of students:

Students' clinical performance has improved through dental rotations. They gained practical experience and developed skills in various dental treatments such as fillings, root canal treatments, and extractions. Continuing to hone and refine these skills will be important as students' progress in their dental education and career. In addition to clinical rotations, they may also want to seek out opportunities for further training and education, such as attending workshops or conferences, collaborating with other dental professionals, or pursuing advanced certifications or degrees. It's also important to stay up-to-date with the latest research and advancements in dental techniques and technologies, so that they can provide the best possible care to patients. One of the students mentioned it as:

"My clinical performance has been improved. In the clinical rotations, we are capable to learn practically the skills of Dental treatment such as filling, RCT, extractions e.t.c"

Measures to improve professional skills:

It's important for students to receive proper supervision and guidance during their clinical rotations to ensure that they are providing safe and effective care to patients. Teachers should be willing to step in and provide thorough guidance to help students improve their skills and build confidence.

"Clinical-based learning should be practiced and students should be supervised properly during their wards and guided adequately where needed because every batch experiences differently in the

same ward. Only some teachers are willing to step out and guide thoroughly & this can potentially differ with the next batch. Students should be supervised during the handling of patients & kindly taught where they need to improve."

Simulation videos can be a helpful tool for students to learn and practice clinical scenarios. Encouraging discussion and sharing personal experiences can help students better understand the material and retain the information.

"Teachers can play simulation videos of clinical scenarios where everyone is encouraged to comment & a discussion is encouraged, they can also share their own experiences (teachers) that taught those lessons, this will serve better than reading /teaching from slides where students are likely to zone out."

Teachers have a great impact on students' interest and engagement in certain subjects. Constant reinforcement and positive reinforcement can help students stay motivated and excited about their coursework.

"Teachers have much more experience than us in giving exams & of being in a learning environment, hence they should know better and be kind. Constant reinforcement helps us all! We all love and gain interest in certain subjects majorly because of the teachers e.g in operative dentistry"

Factors to improve the evaluation system:

Students' perspective on the importance of sharing marked answer sheets with them and making question papers available for review. Being able to see where they made mistakes and learn from them is an important part of the learning process. It also helps to reduce anxiety and uncertainty among students who may be wondering how they performed on a test or exam.

"I believe in discussing & actually showing students their marked answer sheets-very few times do teachers do, but when they do, we are more likely to remember what we did wrong and avoid those mistakes in the future. I do not understand the concept of keeping marked sheets confidential -it only serves a benefit if we are shown them! That's how is been in our school life for like 12 years! Also, certain departments avoid sharing question papers after tests and exams. It is important to understand that these questions are very helpful guide to students & we are able to study smartly, if we know typical questions to be asked. Tests can be kept but a healthy schedule be made departments should have good coordination between themselves & students betterment should be the main goal."

Table 2: Qualitative Analysis: Professional Skills Assessment of Dental Students

Themes	Codes
Factors to increase the performance of students	Better learning environment
	More practice and exposure
	Direct patients interaction
Measures to improve professional skills	More clinical-based teaching
	Reducing unsupported faculty
	More Workshops
	More time
	Increase patients flow
	Increase students confidence
	Increase demonstrations
	SOPs for students
Factors to improve the evaluation system	One instructor per subject should be assigned for evaluation
	Evaluation of professional skills on a regular basis
	Evaluate more by clinical exams
	Reduced instructors' biased scoring
	Formative feedback to students
	Planned evaluation with coordination of departments

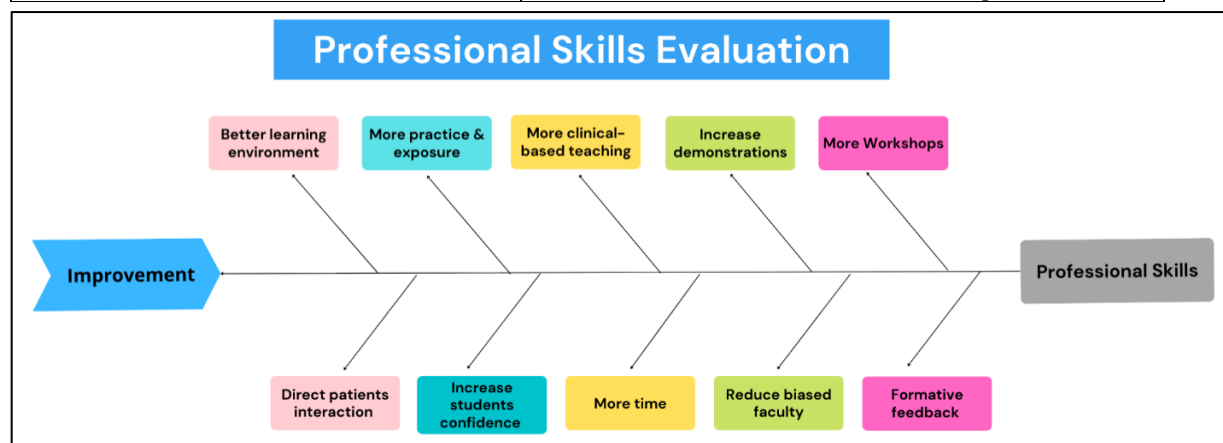


Figure 2: Illustrates factors that improve professional skills of undergraduate students.

Discussion:

As we discussed in the results, professional skills are crucial for undergraduate dental students as they prepare to become competent and confident dental professionals. These skills go beyond the technical aspects of dentistry and include effective communication, teamwork, critical thinking, problem-solving, and ethical decision-making.¹⁵

Compared to the literature, there is need to further develop students' professional skills in patient interaction, instructors may want to seek out opportunities to work closely with experienced dental professionals, such as through mentorship or shadowing programs.¹⁶ Continuing educational courses or workshops can provide valuable training in communication skills, patient management, and other important aspects of dental practice.¹⁷ Every interaction with the patient is an opportunity to learn and grow as a dental professional. To make the most of these opportunities, students should continue to strive for excellence in their practice.¹⁸

We found in other research that when students are trained under direct supervision, they receive immediate feedback on their performance.

This can help them identify areas where they need to improve and adjust their approach in real time. Studies have shown that students who receive direct supervision during training perform better on evaluations and can better apply what they have learned in real-world situations. This helps to prevent errors and improves patient outcomes. Students who receive direct supervision are often more confident in their abilities because they have had the opportunity to practice and receive feedback on their performance. This can translate into better patient care and job performance.¹⁹

We found studies on professional skills but lack literature on improving them. Assessing students at the end of each session is also important because it helps to track their progress over time. We assessed through this study that the evaluation of professional skills is an essential component of dental education and allows learners and instructors to monitor and assess students' progress in these areas.²⁰ Through the evaluation process, instructors can provide feedback and identify areas for improvement to ensure that students are developing

the necessary skills to succeed in their future dental practice.²¹

There was research on how to evaluate professional skills, but there is still a lack of a system of evaluation in institutes. Evaluating professional skills enables learners to take an active role in their own learning by identifying areas where they may need additional support or training.²² This process of self-reflection and feedback can help students become more self-aware and improve their performance in patient care.²³ Professional skills evaluation is an essential aspect of healthcare education that helps to bridge the gap between theoretical knowledge and practical skills.²⁴ Through evaluation, students can identify their strengths and weaknesses and improve their clinical performance to provide better patient care.²⁵ Various tools and methods are available to assess professional skills, including simulation-based evaluations, objective structured clinical examinations (OSCEs), portfolios, and direct observation by supervisors.²⁶

However, we analyzed in our study that despite the availability of these evaluation tools, there are still challenges that need to be addressed in the professional skills evaluation system. One of the significant challenges is the lack of standardization in evaluation methods across different institutions and programs. This makes it difficult to compare and benchmark students' performance across institutions and may limit the transferability of skills from one setting to another.²⁷ Another challenge is the time and resource-intensive nature of evaluation. Effective evaluation requires the availability of trained evaluators who can provide constructive feedback to students.²⁸ However, the shortage of resources, both in terms of personnel and infrastructure, can limit the effectiveness of the evaluation process and result in inadequate feedback to students.²⁹

Our study found that evaluation tools must be aligned with the changing healthcare landscape and reflect the evolving needs of patients and healthcare providers. This requires ongoing research and development of new tools that can capture the complexity of healthcare practice and assess the impact of interventions on patient outcomes.³⁰

This study's limitation is that many tools and methods are available for evaluating professional skills, but still, challenges need to be addressed to ensure effective and standardized evaluation. Developing new evaluation tools and allocating adequate resources to evaluation are essential steps toward enhancing the quality of healthcare education and improving patient care. Professional skills evaluation is a critical aspect of

undergraduate dental education. It allows learners and instructors to work together to ensure that students develop the skills they need to succeed as dental professionals and provide the best possible care to their patients.³¹

Conclusion:

We concluded in our study that interacting with patients is essential for healthcare professionals. It helps students develop communication skills and empathy, which are critical for providing quality care. Most participants mentioned that increasing the frequency and duration of patient interactions during rotations can help students gain hands-on experience and enhance their professional skills. They pointed out that a dedicated facilitator for each rotation can help ensure students receive individualized attention and guidance. They can also provide valuable feedback and help students develop professional skills. We concluded that institutes must balance maintaining academic standards and providing students with the tools they need to succeed. It can also help to promote transparency and build trust between students and facilitators.

Ethical Approval:

This study was approved by Ethical Review Committee of CMH LMC & IOD.

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Conflict of interest

All co-authors had seen and agreed with the content of the manuscript and there is no financial interest.

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Authors' Contributions

LQ, MA, MK, HMON: Conceived the study

LQ, MK: Study Designing

LQ, MA, SR, ZJ, AN: Data collection

LQ, MA, MK, HMON: Data analysis and interpretation

HMON, SR, ZJ, AN: Manuscript writing and proofreading

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