# Assessment of Professionalism Mini-evaluation exercise (P-MEX) among Students in a Private Dental College of Karachi

Nameera Agha, Syeda Maryam Tanweer, Hamda Syed, Fatima Khaleeq, Farzeen Tanwir, Tauqeer Bibi

**ABSTRACT:**

**Objective:** This study aimed to evaluate professionalism among final-year dental students using the Professionalism Mini-Evaluation Exercise (P-MEX).

**Study Design and setting:** A cross-sectional study was conducted at a private dental college in Karachi, Pakistan.

**Methodology: This study assessed** professionalism among 42 final-year dental students using the Professionalism Mini-Evaluation Exercise (P-MEX). The students were selected through convenience sampling method after obtaining approval from the Ethical Review Board (ERC reference: 8430224NAOMS). A total of 12 dental faculty members, who served as evaluators, were included, from the departments of Oral surgery, operative dentistry, prosthodontics and periodontics. The data was collected using the P-MEX tool to assess key domains of professionalism, including doctor-patient relationships (8 items), reflective skills (5 items), time management (3 items), and interprofessional relationships (8 items), totaling 24 items. The evaluators observed the clinical encounters of final year dental students with patients while taking history and during oral examinations and scores were provided on the P-MEX tools. Descriptive statistics were computed, and the mean score of each domain was calculated.

**Results:** The P-MEX was found to be a reliable instrument for evaluating professionalism in dental students. The mean score of dental students for P=MEX was $2.70 \pm 0.21$. However, students demonstrated lower levels of professionalism in the doctor-patient relationship (2.70  0.33) and reflective skills domains (2.56  0.45)

**Conclusion:** The study concludes that final-year dental students exhibit deficiencies in certain aspects of professional behavior. Regular assessment, structured feedback, and capacity-building initiatives are recommended to enhance professional competencies in these areas.

**Keywords:** Assessment, Dental students, Professionalism, Professionalism Mini-Evaluation Exercise (P-MEX)

**Nameera Agha**
Senior Lecturer, Department of Medical Education
Ziaudin University, Karachi.
Email: nameera.agha@zu.edu.pk

**Syeda Maryam Tanweer**
Lecturer, Department of Medical Education
Fazaia Ruth Pfau Medical College, Karachi.
Email: maryamtanweer43@gmail.com

**Hamda Syed**
Lecturer, Department of Pathology
Dow University of Health Sciences, Karachi
Email: hamdasyed@gmail.com

**Fatima Khaleeq**
Assistant Professor, Department of Dental Education
Bahria University Health Sciences Campus, Karachi.
Email: fatimakhaleeq.bumdc@bahria.edu.pk

**Farzeen Tanwir**
Vice Principal & HOD, Department of Periodontology
Bahria University Health Sciences Campus, Karachi.
Email: farzeentanwir.bumdc@bahria.edu.pk

**Tauqeer Bibi**
Assistant Professor, Department of Periodontology
Bahria University Health Sciences Campus, Karachi.
Email: tauqeer.bumdc@bahria.edu.pk

Received: 06-02-2025        1st Revision: 24-02-2025
Accepted: 25-05-2025        2nd Revision: 23-05-2025

## INTRODUCTION

Professionalism is a fundamental competency in medical education, serving as the cornerstone for nurturing compassionate and ethical practitioners.[1] However, due to its conceptual nature, defining professionalism within the field of medicine can be challenging.[2] The Royal College of Physicians describes professionalism as a set of beliefs, actions, and interactions that enable the public to trust the doctors.[3] It is intrinsically linked to core values, ethical standards, and behavior analysis.[4]

As an essential skill required of doctors, professionalism aims to outline the attitudes, behaviors, and qualities expected within the medical profession.[5] The development of professionalism in dental students is a complex process influenced by various elements, including personal values, attitudes, duties, clinical and non-clinical experiences, and the educational environment.[6] Additionally, it should ensure that every practitioner acquires the necessary skills and knowledge for practicing medicine and develops a professional identity that enables them to think, feel, and

act like a doctor.[6]

More importantly, the characteristics of professionalism vary across different cultures. Professionalism has different definitions, instruments, and approaches designed to gauge and evaluate it in one culture, which may not be acceptable or feasible in another. In the same way, the definition of professionalism may not be accurately conveyed in other languages. For these reasons, validity and reliability studies should be conducted before using any scale in a different language or culture.[7]

Professionalism is a multifaceted process that includes personal values, beliefs, and commitments to both clinical and non-clinical experiences as well as their surroundings. In medical education, the term "professional identity formation" (PIF) is new and refers to the experience of learning professional principles, attitudes, and actions within an already-existing identity.[4]

Globally, literature has explored the experiences of professionalism among healthcare professionals, suggesting that professional incompetence can compromise healthcare quality and increase the risk of conflicts, disciplinary actions, and dissatisfaction.[7] In the past 25 years, the focus on professionalism has elevated its significance in both undergraduate and graduate curriculum within Dental discipline.[8] The American Dental Education Association identifies eight components of professionalism in dentistry, which encompass providing patients with effective clinical services, acquiring specific knowledge, and demonstrating proficient behavior—all of which must be continuously developed and maintained through qualified professional engagement.[9] Cultivating a professional identity and fostering professional growth should be achieved through both formal and informal educational opportunities.[10]

Evidence suggests that efforts to teach professionalism can significantly influence students' behavior and professional status. Consequently, formal training in professionalism, along with the rationale for maintaining it, is being increasingly integrated into medical curricula. Professionalism should be taught at all levels, with training encompassing essential areas such as conflict management, feedback, supervisory skills, and assessment.[11] Teaching professionalism necessitates not only a clear core curriculum that covers the entire medical education spectrum, but also extra effort to transmit non-cognitive abilities. In this process, reputable role models are crucial. Providing a secure space for students to reflect on real-life experiences is likely one of the best resources available.[11]

Moreover, the evaluation of professionalism is also crucial in guiding students' professional behavior within medical and dental schools. Developing an appropriate assessment system aligned with learners' career expectations is essential. Professionalism in dentistry can be assessed via written exam, performance-based assessment, competency-based assessment, and portfolios. An effective evaluation system involves a comprehensive, long-term assessment incorporating workplace-based evaluations and multiple observations .[12]

One of the practical tools for assessing professionalism in clinical training is the Professionalism Mini-Evaluation Exercise (P-MEX). It is used to evaluate learners in various settings, such as clinics, emergency rooms, clinical rounds, and small group sessions.[13, 14] The P-MEX was initially developed from the mini-CEX (clinical evaluation exercise) to assess professionalism during observed clinical encounters. It is considered one of the most effective tools for evaluating medical professionalism as it measures objectively observable behaviors and demonstrates high validity and reliability.[15] However, research indicates that an assessment of professionalism using the P-MEX has not yet been conducted among final-year dental students in Karachi, Pakistan. Hence, further research is required for it. Thus, in this study, the 24-item P-MEX has been utilized to assess professionalism among dental students of a private University of Karachi Pakistan.

## METHODOLOGY

This cross-sectional study was conducted at a private dental college in Karachi, Pakistan, to assess professionalism among final-year dental students using the Professionalism Mini-Evaluation Exercise (P-MEX). The time duration for this study was of 6 months, beginning from May 2024 till October 2024. A total of 42 students were selected for the study through convenience sampling. This type of sampling allows gathering data from sources that are conveniently accessible hence it ensured the inclusion of the entire final year batch in the study, that was 42 students. This study was conducted after obtaining approval from the Ethical Review Board. The ERC reference no is 8430224NAOMS. Inclusion criteria was that all the final year dental students of that Private Institute who consented for the study and were attending the clinical rotations during their final year of Dentistry were included in this study. Whereas the students who did not consent for the study were excluded. Written informed consent was obtained from all participants prior to data collection and their responses were kept confidential and anonymous. The participants were also informed that the evaluations made are only for the purpose of the study and the scores will not be included in their summative assessment. A total of 12 dental faculty members were included, from the departments of Oral surgery, operative dentistry, prosthodontics and periodontics and they served as evaluators. Evaluators were included in the study on the basis of their knowledge regarding the concept of professionalism and its essential elements. Those with at least a teaching experience of five years were included in the study. These faculty members attended a workshop where they received hands-on training on the use of P-MEX to ensure consistent and reliable assessments. The aim of the study, the features of

the P-MEX tool, and the evaluation procedure were all covered in this training session.

Data Collection: The Professionalism Mini-Evaluation Exercise (P-MEX) is a structured assessment tool designed to evaluate various dimensions of professionalism in healthcare education. It consists of 24 items, each focusing on a distinct aspect of professional behavior. These items are categorized into four major domains: doctor-patient relationships (8 items), reflective skills (5 items), time management (3 items), and interprofessional relationships (8 items). [13] The P-MEX has been widely validated in medical and dental education, demonstrating strong internal consistency with a Cronbach's alpha of 0.88, indicating a high level of reliability. [14]

In this study, P-MEX assessment forms were distributed among 12 faculty members, all of whom were experienced evaluators with expertise in clinical teaching and student assessment. These faculty members were responsible for observing and assessing final-year dental students during their clinical rotations in the dental outpatient department (OPD). The evaluations were conducted in real-time, ensuring an authentic assessment of students' professional behavior during patient interactions.

The assessment process specifically focused on students' history-taking and oral examination skills, along with their adherence to professional standards. Faculty members utilized the P-MEX tool to score students on all 24 items, using a five-point rating scale: 4=exceeded expectation, 3= met expectation, 2=below expectation, 1=unacceptable, 0=not applicable.

Each student was evaluated based on their ability to demonstrate professionalism across various clinical encounters. By employing direct observation, the study ensured that students were assessed in an objective and structured manner. The collected data provided valuable insights into students' strengths and weaknesses, helping to identify areas requiring further improvement.

Statistical analysis: The statistical analysis was conducted using IBM SPSS Statistics version 20. Descriptive statistics, including mean and standard deviation (SD), were calculated for continuous variables. Additionally, categorical variables were analyzed using frequency and percentage distributions to provide a clear overview of the dataset.

## RESULTS

The results revealed that a total of 12 faculty members out of which 8 were female (66%) and 4 were male (33%) with a mean age of 55 evaluated the final year students of dentistry on the P-MEX form. Around 42 final-year students of dentistry participated out of which 28 were females (66%) and 14 were males (33%). Their mean age was 24 years, with a range of 20 to 26 years. The average score of final-year students of dentistry for P=MEX was 2.70 ± 0.21. The

scores for interprofessional relationship skills were the highest (2.80 ± 0.31) and reflective skills were the lowest (2.56 ± 0.45). The doctor-patient domain had a mean score of 2.70 ± 0.33 whereas time management had a mean of 2.74 ± 0.30. The finding revealed that there was no significant difference between male and female final-year students of dentistry (P value= 0.21). Table.1 shows the mean scores for the four domains of the P-MEX tool. Whereas, Table 2. Shows the mean scores of students for each item of the P-MEX.

## DISCUSSION

Upholding professional values and conduct is essential for graduates and professionals in the medical field, as it significantly influences the quality of clinical care provided to patients, their families, and the broader community.[16] Although the core concepts of professionalism are included in dental curricula, there is a need for greater emphasis on educational development to strengthen these values among dental students.[9,12] In Pakistan, medical colleges do not prioritize professional development, making it difficult to teach this skill effectively. [17] Incompetency in this can lead to poor quality of healthcare and higher rate of dissatisfaction of patients and the provider.[7] Dental professionals must have a solid sense of professionalism and ethics. It emphasizes how these ideas affect patient trust and the general standard of care in addition to directing clinical decision-making.[12]

Key challenges within educational systems include establishing robust standards for professionalism and developing appropriate assessment tools.[18] The working group on professionalism at the International Ottawa Conference has explored prevalent definitions and methods for assessing professionalism[18], leading to the introduction of several tools aimed at evaluating the professionalism of healthcare workers.[10] By improving the abilities and competences of dental students, their future practice is impacted by the assessment of their professionalism, which eventually results in better patient care. A thorough grasp of professionalism encourages moral conduct and personal development, which is advantageous to the individual as well as society.[2,13]

In this study the P-MEX tool was used to assess the professionalism of final-year dental students, providing valuable insights on their competencies and opportunities for improvement. Overall, the mean scores suggest that students have a basic understanding of professional behaviour, with evident strengths in certain areas and potential for

Table-1 Final year students of dentistry mean score on the four domains of P-MEX form

| Domains of P-MEX form | Mean | Standard deviation |
|---|---|---|
| Doctor-patient relationship | 2.70 | 0.33 |
| Reflective skills | 2.56 | 0.45 |
| Time management | 2.74 | 0.30 |
| Interprofessional relationship | 2.80 | 0.31 |

Table 2: The score of final year students of dentistry on 24 items of PMEX-form

| Items | Mean | Standard deviation |
|---|---|---|
| **Doctor-patient relationship** | | |
| Listened actively to patient | 2.85 | 0.43 |
| Showed interest in the patient as a person | 2.71 | 0.51 |
| Showed respect for the patient | 2.80 | 0.46 |
| Recognized and met patient needs | 2.71 | 0.40 |
| Accepted inconvenience to meet patient needs | 2.52 | 0.51 |
| Ensured continuity of patient care | 2.59 | 0.51 |
| Advocated on behalf of a patient and/or family member | 2.60 | 0.46 |
| Maintained appropriate boundaries with patients/colleagues | 2.79 | 0.42 |
| **Reflective skills** | | |
| Demonstrated awareness of limitations | 2.48 | 0.51 |
| Admitted errors/omissions | 2.61 | 0.54 |
| Solicited feedback | 2.51 | 0.53 |
| Accepted feedback | 2.54 | 0.53 |
| Maintained composure in a difficult situation | 2.64 | 0.49 |
| **Time management** | | |
| Was on time | 2.76 | 0.43 |
| Completed tasks in a reliable fashion | 2.73 | 0.41 |
| Was available to patients or colleagues | 2.72 | 0.31 |
| **Interprofessional relationship skills** | | |
| Maintained appropriate appearance | 2.91 | 0.31 |
| Addressed own gaps in knowledge and skills | 2.71 | 0.52 |
| Demonstrated respect for colleagues | 2.99 | 0.34 |
| Avoided derogatory language | 2.71 | 0.31 |
| Assisted a colleague as needed | 2.81 | 0.51 |
| Maintained patient confidentiality | 2.78 | 0.37 |
| Used health resources appropriately | 2.76 | 0.41 |
| Respected rules and procedures of the system | 2.75 | 0.32 |

improvement in others. The results of this study indicate that final-year dental students demonstrated lower professionalism, particularly in the domains of doctor-patient relationships and reflective skills. This aligns with findings from a study conducted in Iran, which reported that dental students' ethical abilities were below average, highlighting shortcomings in the educational system.[19] It also aligns with the study of Maryam Kazemipoor who evaluated the professionalism of dental residents using the Professionalism Mini-Evaluation Exercise (P-MEX). The findings of her study showed the reflective skill domain had the lowest scores i.e., 2.59 0.49. Her study's findings indicated that learners varying professionalism scores were influenced by the absence of a structured instructional program and feedback systems.[20]

The findings also revealed that the lowest score (2.52 0.51) in doctor-patient relationship domain was of "accepting inconvenience to meet patient needs". However, the reflective skill domain got the lowest score in the item demonstrating

awareness of one's own limitations in the domain of reflective skill (2.48 0.51). These gaps could indicate difficulties in balancing clinical duties with patient-centered care and self-reflection. This mirrors the findings of Graskemper JP et al., who noted that it is often difficult in dentistry to prioritize patients' needs and well-being.[21] These findings also align with Ozar's study who suggested that prioritising patient needs and addressing patients' well-being were identified as challenges in dentistry.[22]

Moreover, low scores were also seen for the items of solicited and accepted feedback. These findings are similar to the work of Maryam Kazemipoor who found out that Dental residents received the lowest scores for solicited and accepted feedback.[20] The Farah-Franco study also found that general dental students had the lowest scores for admitting individual faults and accepting feedback.[23] These findings are also similar to Asma Razzaq's study where she assessed the professionalism of pediatric residents using P-MEX and the participants scored lowest for solicited feedback.[17] To

overcome this, Fox in his study suggested that the coaching approach should be introduced, which involves delivering feedback to learners, allowing them to reflect on their experiences and build their skills.[24]

A high mean score was seen for demonstrating respect for colleagues, patients and keeping appropriate boundaries with patients and colleagues. This demonstrates the students' grasp of professionalism, which is crucial for fostering trust and effective communication in the doctor-patient interaction. This finding is consistent with the research, where Järvinen and Kessing (2021) emphasis on the relevance of professional boundaries in healthcare settings. According to these authors, maintaining professional boundaries is more than just establishing barriers; it's also about managing relationships in a way that builds trust and respect.[25] Farah-Franco et al. also demonstrated in her study that the highest scores were seen for avoiding insults, respecting peers, and upholding one's boundaries with others, which is consistent with the findings of the current study. [23] Furthermore, these findings are also supported by the study of Asma Razzaq where the residents secured highest mean scores for maintaining appropriate boundaries and demonstrating respect for colleagues.[17]

A mean score of 2.61  0.54 suggested that however most of the students performed well on the item "admitted errors' but there was still room for improvement. The fact that they can still do better, nevertheless, suggests that their professional behavior does not yet fully incorporate this talent. This emphasizes how important it is for educational establishments to create a culture that values candor regarding errors. This could indicate the need to develop a culture of openness and accountability without fear of being judged. This fear of students, of being judged, when they admit their mistakes can be lessened by fostering an environment of transparency. Instead of concealing errors, such an atmosphere would encourage learning from them. In result it will ultimately improve the standard of patient care.[2, 24] This is consistent with the findings of Fox who recommended that as long as dentists are reluctant to acknowledge their mistakes for fear of punishment and other legal repercussions, and this fear will be transmitted to the next generation.[24] A culture of silence concerning mistakes can be sustained by this fear, which can be passed down to future generations of dentists. In order to break the loop and advance a more open healthcare system, this issue must be addressed.[24]

The initial step towards fostering professional behavior involves cultivating ethical sensitivity. Studies worldwide have shown a tendency for student's professional behavior to decline during their academic years.[13] Therefore, it is recommended that students displaying unprofessional behavior should be closely monitored. Students are able to comprehend the standards and expectations in their area when clear ethical rules are established and communicated. Consistent ethical behavior and decision-making are

supported by this clarity and should be given immediate feedback provided by supervisors to enhance their professional sensitivity.[13, 27] It is also observed that the unprofessional conduct among students may be attributed to the lack of a structured curriculum, assessment, and feedback system. For meaningful change in professional relationships, a sustained commitment to cultural transformation is necessary.[21, 27] To support behavioral change and encourage professionalism, resources such as remediation, monitoring, and reflection have been introduced.[28] By Promoting open discussions with students regarding moral dilemmas enables teachers to exchange viewpoints and experiences, leading to a better comprehension of moral dilemmas. Regular ethics-focused team meetings, seminars, and workshops can all help to foster these kinds of conversations. Consequently, supervisors and academic leaders are encouraged to cultivate a culture of self-reflection and reflective practice within educational settings.[29] Kazemipoor et al. emphasize that the P-MEX promotes reflection and recognition of professional behaviors, which are essential for developing a comprehensive understanding of professionalism in clinical practice.[20] The feedback provided through the P-MEX is instrumental in guiding students toward recognizing their strengths and weaknesses. Alam et al. argue that integrating the P-MEX into the curriculum not only enhances the assessment of professionalism but also fosters a culture of continuous improvement among students. [30]

A major strength of this study is its comprehensive approach to evaluating professionalism from multiple perspectives. By analyzing professionalism in dental education, the study underscores its critical role in shaping future healthcare professionals and ensuring high-quality patient care. Additionally, it highlights the dynamic nature of professionalism, emphasizing the need for continuous evolution in educational strategies to align with the demands of modern medical practice. The study also demonstrates methodological rigor by incorporating well-established assessment tool (P-MEX), enhancing the validity and reliability of its findings. The use of this standardized evaluation instrument allows for a more precise and objective measurement of dental students' professionalism. Moreover, the study suggests integrating the P-MEX tool into educational curricula, advocating for continuous monitoring and structured feedback mechanisms to enhance professional development.

Despite its strengths, the study has some limitations. The primary constraint is its small sample size, which limits the generalizability of the findings. Larger and more diverse participants would provide a broader representation of professionalism in dental education. Additionally, the study is confined to a specific setting, which may not capture variations in professional behavior across different institutions, regions, or cultural contexts.

To strengthen future research, multi-center studies involving diverse educational institutions and healthcare settings are recommended. Such studies would allow for a more comprehensive assessment of professionalism among healthcare professionals. Moreover, longitudinal studies tracking students' professional development over time could provide deeper insights into the effectiveness of different educational interventions.

## CONCLUSION

The study indicates that while students possess a foundational understanding of professional behavior, there are evident gaps that must be addressed through enhanced teaching methodologies and continuous assessment. The Professionalism Mini-Evaluation Exercise (P-MEX) has proven to be an effective tool for evaluating professionalism, providing valuable insights into students' strengths and areas requiring improvement. The findings emphasize the necessity of ongoing instruction and structured feedback systems to foster professionalism among final-year students throughout their academic journey. Specifically, the study highlights deficiencies in reflective practice and doctor-patient relationship skills, indicating key areas that require targeted intervention. To bridge these gaps, it is crucial to implement structured educational strategies and periodic evaluations that assess and reinforce professional behaviors. A well-designed framework for continuous education and assessment will not only enhance students' professional competencies but also better prepare them for real-world clinical practice.

**Authors Contribution:**
**Nameera Agha:** Designed the study and collected data and major contributor in writing manuscript.
**Syeda Maryam Tanweer:** Major contributor in writing the manuscript and designing of study.
**Hamda Syed:** Performed data analysis and interpretation of results
**Fatima Khaleeq:** Data collection and analysis
**Farzeen Tanwir:** Supervision and critical review.
Tauqeer Bibi: Data collection and proof read.

## REFERENCES:

1. Shakour M, Badrian M. Assessment of professionalism between medical students in clinical situations. International Journal of Medical Investigation. 2015 Jun 10;4(2):199-207.

2. Mueller PS. Teaching and assessing professionalism in medical learners and practicing physicians. Rambam Maimonides medical journal. 2015 Apr;6(2). DOI: http://doi:10.5041/RMMJ.10195. PMID: 25973263; PMCID: PMC4422450

3. Amer H, Joseph F. The future physician. Future Hospital Journal. 2017 Feb;4(1):61. DOI: http://doi:10.7861/futurehosp.4-1-61. PMID: 31098290; PMCID: PMC6484171

4. Ahmed FK, Farooq FA, Mushtaque SA, Malik AH, Mushtaque HE, Azhar RA. Evaluation of Medical Professionalism among the Students and Faculty Members of Public and Private Medical Colleges of Karachi, Pakistan a Comparative Study. Pakistan journal of medical and health sciences. 2022 Jan;16(01):866-9. DOI: https://doi.org/10.53350/pjmhs22161866

5. Bhardwaj A. Medical Professionalism in the Provision of Clinical Care in Healthcare ganizations. J Healthc Leadersh. 2022;14:183-189. Published 2022 Oct 26. DOI: https://doi.10.2147/JHL.S383069

6. Olive KE, Abercrombie CL. Developing a physician×'s professional identity through medical education. The American journal of the medical sciences. 2017 Feb 1;353(2):101-8.

7. Taþçý AÝ, Akdeniz E, Gülpýnar MA, Danacýoðlu YO, Sarý EE, Yaþar L, Karandere F, Ferahman S. Adaptation of the professionalism mini-evaluation exercise instrument into Turkish: a validity and reliability study. BMC Medical Education. 2023 Sep 26;23(1):698. DOI: http://doi:10.1186/s12909-023- 04675-6 PMID: 37752458; PMCID: PMC10523623

8. Khalaf K, El-Kishawi M, Al Kawas S. Exploring Professionalism among Final Year Dental Students and New Graduates: Translating Knowledge to Practice. Eur J Dent. 2023;17(2):365-373. DOI: http://doi:10.1055/s-0042-1743153

9. Smith KJ, Farland MZ, Edwards M, Buring S, Childs GS, Dunleavy K, Estrada AH, Multak N, Patton PR, Schentrup D, Blue A. Assessing professionalism in health profession degree programs: a scoping review. Currents in Pharmacy Teaching and Learning. 2021 Aug 1;13(8):1078-98. DOI: http://doi:10.1016/j.cptl.2021.06.006. Epub 2021 Jun 23. PMID: 34294251

10. Neville P, McNally L, Waylen A. Developing a Dental Scrubs Ceremony to define professional identity and teach professionalism to dental undergraduates; lessons learned. European Journal of Dental Education. 2018 Aug;22(3):e542-54. DOI: http://doi:10.1111/eje.12351. Epub 2018 Apr 13. PMID: 29652107

11. Altirkawi K. Teaching professionalism in medicine: what, why and how?. Sudan J Paediatr. 2014;14(1):31-38.

12. Zijlstra-Shaw S, Roberts TE, Robinson PG. Perceptions of professionalism in dentistry–a qualitative study. British Dental Journal. 2013 Nov 9;215(9): E18-. DOI: http://doi:10.1038/sj.bdj.2013.1048. PMID: 24201649

13. Li H, Ding N, Zhang Y, Liu Y, Wen D. Assessing medical professionalism: a systematic review of instruments and their measurement properties. PloS one. 2017 May 12;12(5):e0177321. DOI:http://doi:10.1371/journal.pone.0177321. PMID: 28498838; PMCID: PMC5428933.

14. Bajwa NM, Nendaz MR, Posfay-Barbe KM, Yudkowsky R, Park YS. A meaningful and actionable professionalism assessment: validity evidence for the Professionalism Mini-Evaluation Exercise (P-MEX) across 8 years. Academic Medicine. 2021 Nov 1;96(11S):S151-7. DOI: http://doi:10.1097/ACM.0000000000004286. PMID: 34348372

15. Cruess R, McIlroy JH, Cruess S, Ginsburg S, Steinert Y. The Professionalism Minievaluation Exercise: A preliminary investigation. Acad Med. 2006;81(10 suppl): S74 –S78. http://journals.lww.com/academic medicine/Fulltext/2006/10001/The_ Professionalism_Mini_Evaluation_Exercise__A.19.aspx. Accessed April 7, 2011.

16. Amirhajlou L, Bidari A, Alipour F, Yaseri M, Vaziri S, Rezai M, Tavakoli N, Farsi D, Yasinzadeh MR, Mosaddegh R, Hashemi A. Validity, reliability and acceptability of Professionalism Mini-Evaluation Exercise (P-MEX) for emergency medicine residency training. Journal of Medical Ethics and History of Medicine. 2019;12. DOI:http://doi:10.18502/jmehm.v12i12.1641. PMID: 32328225; PMCID: PMC7166245

17. Razzaq A. Measuring professionalism in postgraduate paediatric residents using professionalism mini-evaluation exercise (P-MEX). Pakistan Armed Forces Medical Journal. 2019 Aug 27;69(4):784-88.

18. Tay KT, Ng S, Hee JM, Chia EW, Vythilingam D, Ong YT, Chiam M, Chin AM, Fong W, Wijaya L, Toh YP. Assessing professionalism in medicine–a scoping review of assessment tools from 1990 to 2018. Journal of medical education and curricular development. 2020 Oct; 7:2382120520955159. DOI: http://doi:10.1177/2382120520955159. PMID: 33150208; PMCID: PMC7580192.

19. Afshar L, Rezvani G, Hosseinzadeh M, Samavatiyan Z. Evaluation of moral skills of undergraduate dental students at Shahed University using a questionnaire. Bioethics. 2017 Jan 1;7(24):47-54.

20. Kazemipoor M, Keshmiri F, Owlia F, Rashidi Maybodi F. Assessment of dental residents' professionalism through Professionalism Mini-Evaluation Exercise (P-MEX). Journal of Dental Education. 2021 Apr;85(4):456-62. DOI: http://doi:10.1002/jdd.12479. Epub 2020 Nov 17. PMID: 33205404.

21. Graskemper JP. Professional responsibility in dentistry: a practical guide to law and ethics. John Wiley & Sons; 2023 Jan 31.

22. Ozar DT. Professionalism: challenges for dentistry in the future. The Journal of Forensic Odonto-Stomatology-JFOS. 2012;30(1):72-84.

23. Farah-Franco S, Singer-Chang G, Deoghare H. Advancing the measurement of dental students' professionalism. Journal of dental education. 2017 Nov;81(11):1338-44. DOI: http://10.21815/JDE.017.092

24. Fox K. 'Climate of fear'in new graduates: the perfect storm?. British Dental Journal. 2019 Sep;227(5):343-6. DOI: http://10.1038/s41415-019-0673-0.

25. Järvinen M, Kessing ML. Self-casting and alter-casting: Healthcare professionals' boundary work in response to peer workers. Current Sociology. 2023 May;71(3):414-31. DOI: http://10.1177/00113921211048532

26. Peters D, Ramsewak SS, Youssef FF. Knowledge of and attitudes toward medical professionalism among students and junior doctors in Trinidad and Tobago. The West Indian Medical Journal. 2015 Mar;64(2):138. DOI: http://doi:10.7727/wimj.2013.214. Epub 2015 Jan 29. PMID: 26360688; PMCID: PMC4696629

27. Al-Eraky MM. Twelve Tips for teaching medical professionalism at all levels of medical education. Medical Teacher. 2015 Nov 2;37(11):1018-25. DOI: http://doi:10.3109/0142159X.2015.1020288. Epub 2015 Mar 17. PMID: 25776227

28. Vacha-Haase T, Elman NS, Forrest L, Kallaugher J, Lease SH, Veilleux JC, Kaslow NJ. Remediation plans for trainees with problems of professional competence. Training and Education in Professional Psychology. 2019 Nov;13(4):239. DOI: http:// 10.1037/TEP0000221

29. Irby DM, Hamstra SJ. Parting the clouds: three professionalism frameworks in medical education. Academic Medicine. 2016 Dec 1;91(12):1606-11. DOI: http://doi:10.1097/ACM.0000000000001190. PMID: 27119331.

30. Alam B., Najmi M., Hussain T., Babar B., Ghani S., Khan A. et al., Perception of dental students and faculty regarding the practice of professionalism in dentistry using the professionalism mini evaluation exercise (p-mex) work. 2024;77(1):211-218. DOI: https://doi.org/10.3233/wor-220694