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Designing a Tool to Assess Professionalism Among Dental Students

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A B S T R A C T

Objectives: Professionalism is essential to a strong and trusted patient-doctor relationship, which is believed to potentially enhance patient compliance and treatment outcomes. The purpose of our study was to develop and conduct a psychometric analysis of an assessment tool to evaluate the professional behavior of dental students.

Materials and Methods: The study was performed in the School of Dentistry, Tehran University of Medical Sciences. After providing a pool of various criteria to assess professionalism, an expert panel prepared the primary version of the tool. The tool was set in a questionnaire frame to explore the significance level and evaluation feasibility of each criterion. The questionnaire was completed by tutors of the "Medical Ethics" course (n=6). After necessary revisions, face and content validity were evaluated by giving the checklist to eight experienced dental educators to determine the relevance, clarity, and simplicity of the questions. In the second stage, the final checklist (37 items) was given to dental educators to evaluate twenty students. To assess the reliability of this checklist, at least two professors evaluated each student, and weighted-κ was calculated. Minor revisions were made based on the received feedback.

Results: According to our data, the total validity of the tool (S-CVI) was 100%. For all items except one, the weighted-κ coefficient was ≥ 0.5, indicating sufficient reliability for these items.

Conclusion: Despite the limitations of the present study, the designed tool to evaluate professionalism among dental students in different clinical departments seems to be both valid and reliable.

Keywords: Professionalism; Education, Dental; Educational Measurement; Validation Study; Dentistry

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INTRODUCTION

Professionalism and bioethics principles are essential for establishing a strong and trusted patient-doctor relationship, which is believed to potentially enhance patient compliance and treatment outcomes. Professionalism has been defined as "a life characterized by a display of high intellectual, technical, and moral qualities and abilities, in service to patients and community" [1]. In addition, commitment to the "Physician

Charter on Professionalism" will promote the social status of practitioners and reduce patient complaints [2]. According to a study in Iran, the majority of complaints against dentists had been triggered by inappropriate rapport and professional misconduct [3].

The evaluation of professionalism among medical and dental students has been a matter of concern. Despite the diverse range of tools available to measure medical professionalism, the field is still characterized by a scarcity of methodologically rigorous studies evaluating their effectiveness. [4]. Some challenges reported in previous studies include assessing the emotional behavior instead of the best potential behavior, lack of clarity in the definition of professional commitment, multi-faceted nature of professional commitment which necessitates the use of multiple evaluation methods, inconsistency between knowledge of professional behavior and actual behavior [5], personal bias and the lack of objectivity, and the educators' reluctance to assess professional behaviors of students [6-8].

Some studies have focused on assessing professionalism among healthcare students. In 2000, Weis and Schank described the Nursing Professional Values Scale (NPVS), its preparation, and its validity and reliability. Initial results indicated high levels of validity and reliability for the NPVS, identifying it as a useful tool to measure nursing professional values and to enhance the social aspect of the profession [9].

Alcota et al. [10] carried out a study to evaluate the effect of the curriculum and the scientific teaching methods of the School of Dentistry at the University of Chile on the students' commitment to ethical principles. Areas of evaluation in ethical commitment included honesty, tolerance, responsibility, and respect. In the social responsibility dimension, domains included correlation, teamwork, and concern about communicating with the patient. The results revealed that neither the students nor the scholars believed that ethical commitment and a sense of social responsibility were adequately promoted in the curriculum. However, they do recognize the significance of these qualities in dental practitioners.

Raee et al. [11] stated in their study that self-assessment and peer assessment provide important information about the performance and behavior of individuals in all aspects of the professional workplace. They found a significant difference between self-assessment and other assessment methods. The study demonstrated that team-based assessment is a viable and acceptable approach for self-assessment and peer assessment among medical students, offering several advantages over traditional assessment methods.

In Iran, both public and private dental schools are accredited by the Ministry of Health and Medical Education (MOHME). The Council for Dental Education in the MOHME is responsible for developing, revising, and overseeing the implementation of the national dental curriculum, which must be strictly followed by all dental schools in the country. Previous iterations of the national dental curriculum in Iran lacked sufficient training in meta-competencies such as communication skills, professionalism, and evidence-based dentistry [12]. However, in the latest major curriculum revision in 2012, a new course on communication skills and professionalism was introduced. Additionally, the existing course on medical and dental ethics underwent a complete transformation from a lecture-based format to an interactive course [12]. However, the evaluation of students' professional behavior in this course currently focuses only on assessing theoretical knowledge.

The dental education system in Iran is discipline-based, and students rotate among 10 clinical departments during their under-graduate training. While educators assess the clinical skills of students using various methods at the end of each rotation, no formal assessment of professionalism is conducted. Although some developed tools to assess professionalism in dental schools exist [5], there seems to be a need for adaptation and customization before their adoption for use in Iranian dental schools. The specific characteristics of the dental education system in Iran, along with different cultural and social norms, necessitate careful consideration before adopting previously developed assessment tools.

In the present study, we first developed a tool to assess professionalism among clinical dental students, and then, we assessed the validity and reliability of this tool to evaluate the professional behaviors of students with their patients and professors.

MATERIALS AND METHODS

Context

The present research was done in 2018 in the School of Dentistry, Tehran University of Medical Sciences, which is the oldest Iranian dental school. The school is located in the capital city of Tehran and recruits around 70 students annually through the national university entrance examination. These accepted students attend a six-year Doctor of Dental Surgery (DDS) curriculum, which has three parts: basic sciences (the first two years), pre-clinic (year 3), and clinic (the last three years) phases.

Participants and procedures

The Research Ethics Committee of Tehran University of Medical Sciences (TUMS) approved the study (approval code: IR.TUMS.DENTISTRY.REC.1396.2463). To begin, a comprehensive search was conducted through various databases, including MEDLINE, Google Scholar, Web of Science, and local databases, to identify articles related to codes, evaluation, and training of professional ethics. Papers and documents containing codes of medical ethics and professional behavior were retrieved and the relevant codes were extracted. The research team carefully reviewed the retrieved documents and selected four main sources. These sources included professional ethics documents from the American Dental Association [13], codes from the European Federation of Internal Medicine [2], codes from the American Board of Physician Specialties [14], as well as a paper on nurses' professional performance codes [9].

Next, an expert panel was formed of developers and tutors of the recently revised" Medical Ethics" course [15] in the Iranian National Dental Curriculum (INDC) (n=6), as well as INDC Revision Committee members (Council for Dental Education, Ministry of Health and Medical Education) (n=5). Through a thorough discussion panel involving all 11 panel members, the extracted codes were reviewed and discussed in detail. Codes that were deemed more suitable for medical disciplines other than dentistry or clinical environments outside the university, codes that were overly general and ambiguous, and codes that overlapped with other codes were removed based on the panel members' opinions. As a result, a primary checklist consisting of 35 items was created.

Evaluation of checklist validity: phase 1

The 35-item primary checklist was created in the form of a questionnaire. The questionnaire had five domains of professionalism [16]: respect, honesty, confidentiality, job dignity, and dutifulness. The questionnaire asked the respondents to react to the significance of each item in assessing the professionalism among dental students in different departments of the dental school in the form of a 5-point Likert scale from "least important" to "most important.". Additionally, the questionnaire assessed the feasibility of assessing each item within dental school settings, using a 5-point Likert scale ranging from "Not feasible" to "Completely feasible." The questionnaire also included blank spaces for respondents to add any additional codes they felt were missing. The six tutors of the "Medical Ethics" course in TUMS dental school completed the questionnaire.

Evaluation of checklist validity: phase 2

To complete the process of face and content validity evaluation [17, 18], the checklist was given to eight dental educators at the School of Dentistry, TUMS. These educators were tasked with assessing the relevance, clarity, and simplicity of each item on a scale ranging from 1 to 4. Furthermore, in a designated column for descriptive explanations, the respondents were given the opportunity to provide detailed explanations regarding any items they found unclear or in need of further clarification. In a subsequent discussion meeting involving the respondents and an epidemiologist, changes were made based on the descriptive comments provided. As per the experts' feedback, it was determined that two items on the checklist were excessively lengthy. Consequently, each of these two items was divided into two separate items, resulting in a final checklist comprising 37 items.

Evaluation of checklist reliability

In the second stage, the final checklist, prepared

with 37 items, was given to a convenient sample of experienced dental educators of the Endodontics, fixed and partial Prosthodontics, Periodontics, and Pedodontics departments to assess the professional behavior of their students with the checklist in their departments. At least two educators evaluated each student [19]. The respondents were also given the opportunity to provide comments on the items.

To select the students for evaluation, a list of all students attending the selected departments during the study period (n=60) was obtained. The routine educational program of the students was then examined, and a shortlist was created comprising students who could be assessed by at least two selected educators during the study period (20 students) [19]. Among these, four students from the Endodontics department, eight students from the Prosthodontics department, and eight students from the Pedodontics department were assessed. As for the Periodontics department, the students in this department typically rotate with a single educator throughout their entire rotation. Therefore, the eight students assessed in the Periodontics department were selected from those who had previously been assessed in the Prosthodontics and Pedodontics departments. This approach ensured that each student received evaluations from at least two educators, as per the study design.

To ensure the confidentiality and anonymity of the students, a unique code was assigned to each student for data processing purposes. In Prosthodontics, Pedodontics, and Periodontics departments, eight same students, and in the Endodontics department four students were selected through a combination of random (where possible) and convenience sampling, based on the structure of the courses.

Finally, a group discussion involving the authors and an epidemiologist was conducted to address items that exhibited low κ coefficients. The purpose of this discussion was to refine the definitions and ensure appropriate coordination among the departments. Furthermore, additional comments provided by clinical dental educators were taken into consideration during the discussion. Based on the insights gained from this revision process, the checklist was finalized.

Figure 1 shows various steps of tool development and psychometric analysis.

Measures and variables of interest

During the first phase of evaluating the validity, face and content validity were appraised by assessing the significance of including each item in the final tool, as well as the feasibility to measure the item in the dental school setting [17, 18]. In the second phase of validity assessment, the relevance, clarity, and simplicity of each item were assessed. Then, the overall validity of the tool (Scale Content Validity Index: S-CVI) was calculated [18]. In the final step in order to verify the reliability, we calculated the coefficient of the weighted κ for each item.

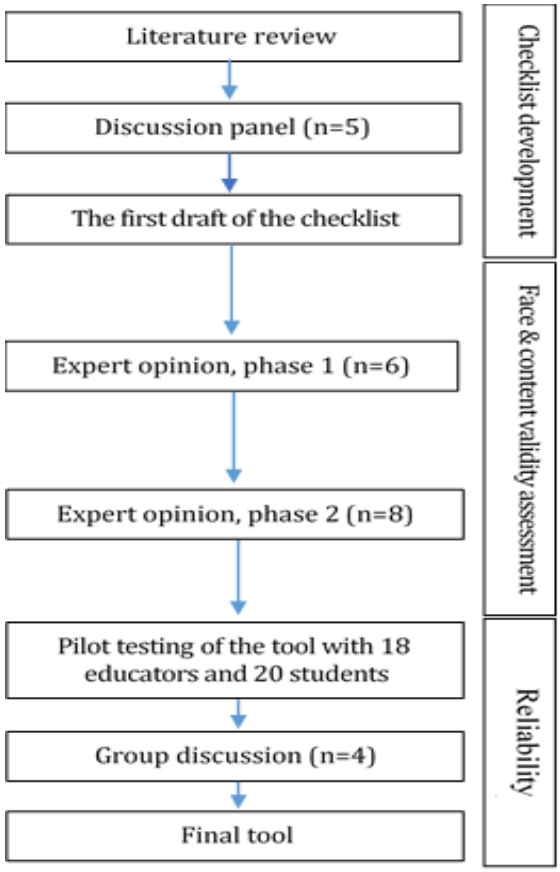

Fig. 1. The flow diagram of the various phases of the study.

Analyses

The score for the significance and feasibility to evaluate each code was determined separately by summing up the score given by the respondents. The items were categorized into four groups: first, those with a significance score of 24 or higher and an assessment feasibility score of 18 or higher, without any score of 1; second, those with a significance score of 24 or higher and an assessment feasibility score of 18 or higher, but with at least one score of 1; third, those with a significance score of 24 or higher and an assessment feasibility score of less than 18; and fourth, those with a significance score below 24 and a significance level below 18. The cutoffs for the categories were determined based on the possible score range of 6 to 30.

According to the scores, two items, "Introducing him/herself and team members to the patient and family" and "Appropriate relationship with patients," which were in the last category were removed from the checklist. Items in the second and third categories were retained but were revised based on the comments provided by the respondents. Additionally, some items were changed in terms of their domain based on the feedback received.

The overall validity of the tool (Scale Content Validity Index: S-CVI) was calculated by dividing the number of questions considered desirably relevant or clear by all respondents by the total number of questions. Furthermore, a guideline was developed in response to the comments from the respondents to provide a better understanding of certain checklist items, and this guideline was included as an attachment to the checklist.

RESULTS

In the content validity evaluation, all items were completely appropriate in terms of relevance. According to respondents, items such as "consultation and referral, having critical spirit, paying attention to the demands and needs of the patient, privacy in communications, respecting beliefs, values and cultural and religious priorities of patients, active listening to patient's needs and requests, and providing patient's information to the professor, if necessary and with the consent of the patient" had insufficient simplicity, and were revised (Table 1). Additionally, there were other items such as "consultation and referral, having critical spirit, empathy and sympathy with patients, paying attention to the demands and needs of the patient, privacy in communications, respecting patient privacy, respecting beliefs, values and cultural and religious priorities of patients, respecting patient's independence, preserving patient's rights in his/her presence or absence and in the presence of the treatment team, being honest if an error would occur in treatment, paying attention to violations of patient rights and reporting to the responsible supervisor, and maintaining the professional dignity inside and outside interactions of working environment" that were considered insufficiently clear. Necessary revisions on these items were done (Table 1). The overall validity of the tool (S-CVI) was found to be 100%.

The κ coefficient for all items, except for the item "Providing an honest explanation to the patient if a malpractice would occur" was found to be greater than or equal to 0.5. Thus, this item was removed from the checklist. Also, according to the final group discussion, the checklist was finalized through the modification of some items. Moreover, based on the comments received, a global rating scale from 1 to 5 was added to the end of the checklist. The final questionnaire is shown in Table 1. Dental school, clinical department, the attending course, evaluating professor, student's name, and date of evaluation were recorded. Since some items of this tool are rare but may occur, they were not removed from the list. A general score was reported for these items, which was added at the end of the tool, as follows: if the item does not occur during the assessment period, the student will receive a positive score, if it happens and the student complies, two positive scores, if it happens and the student does not comply, a negative score.

Table 1. The tool for evaluating the professional behavior of dental students in different clinical departments

Domain	Questions	Very high	High	Moderate	Low	Very low
Conscientiousness	1- Suitable dress code inside the work environment					
	2- Maintaining the dental professional dignity and respecting inside interactions					
	3- Tracking the patient treatment process					
	4- Identifying professional errors and reporting them to the responsible supervisor					
	5- Accepting responsibility for his/her actions					
	6- On time and complete presence in the department					
	7- Following up on the consultation and referral					
	8- Submitting an accurate and complete report					
	9- Seriousness in doing the best for patients (prescribed treatment)					
	10- Seriousness in learning in the class or department					
Altruism	11- Seriousness in learning in the class or department					
Confidentiality[1] and trustfulness	12- Provide an honest explanation to the patient if an error would occur					
	13- An attempt to ensure the confidentiality of the patient's information (except expressing the patient's information to the responsible professor for treatment, or those threatening the lives of others, or when a patient has not reached the legal age)					
	14- Reporting to the responsible supervisor about violations of patient rights					
Justice	15- Excluding discrimination in patient selection/treatment					
	16- Respecting religious/cultural beliefs and values of patients					
	17- Active listening to patient's requests[2]					
	18- Calling the patient and those who accompany him/her in an appropriate way					
	19- Empathy and sympathy with patients[3]					
	20- Paying attention to the patient's needs					
	21- Paying attention to the patient's emotional/psychological needs					
	22- Privacy in communication (keeping the appropriate distance, considering religious considerations)					
	23- Respecting patient privacy (with no unnecessary questions)					
	24- Conscientious listening					
	25- Spending time and patience in teaching the patient (or the patient's parents)					
Job excellence	26- Having a critical spirit					

Domain	Questions	Very high	High	Moderate	Low	Very low
Respect for patient autonomy	27- Respecting patient's decisions (or patient's parents)					
	28- Informing the patient (or the patient's parents) of the treatment and alternative treatment plans according to the supervisor					
	29- Providing the patient (or patient's parents) with the necessary and suitable information					
Honesty and rectitude	30- Non-reciprocity with abusive behaviors from patient or chaperon					
	31- Preserving patient's rights in his/her presence					
	32- Preserving patient's rights in his/her absence					
	33- Honest behavior (honesty, fairness, frankness, keeping promises)					
	34- Overall assessment of student professional behavior					

1- The importance of confidentiality in terms of medical ethics is to respect the principle of freedom, human independence, the right to control and manage information – trust, and confidence between physician and patient to prevent social harm and discrimination. In two cases, violation of confidentiality is allowed: a) to protect the patient from danger, and b) to protect others from danger
2- Active listening is finding the meaning of others' speech in your mind. Hearing is different from listening and is a physical activity that does not require learning. Listening is a mental activity that requires learning and is not perceived until we pay attention to it.
3- Empathy is the ability to experience the same feelings in other people. This feeling goes beyond sympathy, which is simply to pay attention to people's feelings

DISCUSSION

The purpose of the present study was to design a tool to assess the professional behavior of dental students in different clinical departments in dental school and to assess the face and content validity and reliability of the designed tool. Evaluating validity is more challenging than reliability, but it holds greater significance [19]. Therefore, we conducted several steps to assess the validity of the tool. Based on the study results, after necessary modifications and adjustments, the designed tool appeared to be both valid and reliable.

The national dental curriculum in Iran spans six years and follows a discipline-based approach, with students rotating through different clinical departments separately. In the final two semesters, a comprehensive care course is also included [15]. Although the designed checklist was developed within this context, it can also apply to comprehensive care-model schools, as the aim was to create a tool that can be utilized across departments regardless of the discipline. Some items were adjusted to include the expression of the patient's parent, allowing for potential use in the pediatric dentistry department. However, the data obtained from the pediatric dentistry department did not exhibit homogeneity compared to the other departments, indicating the need for further evaluation of the tool's suitability for the pediatric dentistry department.

Several limitations were encountered in this study, including challenges in assessing students due to educators' heavy workload, the short-term nature of student assessment, the lack of objective definitions for certain professional subjects, and the small sample size. However, the limited sample size can also be viewed as a strength, considering the scarcity of similar studies in this field and the need for a pilot project.

The validation process of the tool involved a diverse range of experts from various disciplines, both non-clinical and clinical, including epidemiology, public health, medical education, prosthodontics,

endodontics, pediatric dentistry, orthodontics, and periodontics. However, there were limitations in the study, as it was not possible to modify the students' routine program for the study. Consequently, the inter-examiner reliability was tested with only two evaluators. Additionally, the limited time available due to the short duration of students' presence in each clinic prevented the assessment of intra-examiner reliability, which should be explored in future studies.

A study in the Dentistry Faculty at Southeast Nova University in the US examined ten elements related to student communication with patients. These elements included providing clear and relevant questions, demonstrating concentration and active listening, responding appropriately to ensure patient satisfaction, observing and appropriately interpreting nonverbal patient behavior, helping patients reduce anxiety and promoting comfort, presenting oneself professionally, and displaying sensitivity to cultural, racial, ethnic, and sexual differences [20]. This study primarily focuses on the second aspect of professionalism according to Wilkinson's framework, which involves effectively interacting with patients and individuals important to their care. In contrast, the items in our study are not limited to a specific concept and encompass a broader scope. [21].

In a study conducted at the University of Groningen, the Netherlands [22], a self-assessment tool to assess the professional behavior of dental students and the overall opinion of supervisors was designed. In this form, there were three general criteria on a 5-point scale (1=inadequate qualification, 3=sufficient, 5=excellent) and the filling was mandatory. Each criterion was further divided into sub-criteria indicated by smiley faces (meaning better than medium/excellent) or a sad sign (inadequate/need to be corrected). Space was also provided for descriptive comments. However, this evaluation tool was specifically designed for preclinical students and did not include codes related to patient interactions, making it significantly different from the codes used in our current study.

A cross-sectional study was conducted by Hoobehfekr et al. at TUMS teaching hospitals with the objective of assessing the medical students' perspectives regarding the professionalism environment within the university. In that study, the UMKC-SOM Climate of Professionalism survey was distributed to a sample of 165 medical students. While some items in this survey may overlap with the current checklist, our tool offers a more comprehensive assessment with an expanded set of items [23].

A study in the UK evaluated a professionalism assessment system for dental students and concluded that the assessment program benefitted from good internal reliability and validity [24]. Although the findings are similar to ours, it should be noted that in addition to teachers' assessment, the UK study included students' self-report of their professional performance. Moreover, the program assessment had a qualitative part [24]. Another study in Malaysia assessed the professional behavior of senior dental students in a clinical setting using a multisource feedback questionnaire in addition to a written test. The findings showed a correlation between these two methods [25]. Unlike our study, the Malaysian study employed a 360-degree evaluation approach, incorporating feedback from patients, peers, assistants, faculty, and staff, which differs from our methodology.

Some of the studies in the field of professionalism assessment in dentistry have focused on the knowledge, attitudes, and perceptions of dental students, new graduates, and faculty members toward various domains of professionalism. For example, a study in UAE reported that dentists might be unable to apply their knowledge of professionalism in real-life scenarios and suggested integrated models of teaching professionalism to dental students [26]. In a study in Chile, dental students and faculty rated Consciousness and Altruism as the most valued traits of professionalism [27]. An Indian study assessed professionalism among dental students through a self-assessment questionnaire

survey and concluded that the students possessed at least some of the professionalism elements [28].

The scarcity of local and international studies and resources in the field of professionalism assessment in dentistry was one of the major limitations of this research. The use of other medical resources partially covered this limitation. Moreover, the small population of this study can be considered as a weakness. However, it can be also a strength since the present study can be considered as a primary step in this field to explore problems, limitations, and obstacles. The content of the curriculum seems to play a pivotal role in this regard. For example, a study from Chile reported that the students and the scholars believed that ethical commitment and a sense of social responsibility were not promoted in the dental curriculum [10]. Nevertheless, further studies are needed to explore the effect of the curriculum and the scientific teaching methods on the students' commitment to ethical principles.

CONCLUSION

Given the limitations of the present study, the designed tool to evaluate the professional behavior of dental students in different clinical departments appears to demonstrate both validity and reliability. As a result, this tool can be utilized as a novel assessment instrument in various departments of dental schools, particularly those following a discipline-based curriculum.

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CONFLICT OF INTEREST STATEMENT

None declared.

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