



Development and Validation of the Ethical Behavior Intention Scale for Medical Students Based on the Theory of Planned Behavior



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ABSTRACT

Aims Professionalism encompasses clinical competence, communication skills, and ethical and legal awareness. The assessment of professional ethics varies among different groups based on their characteristics. This study aimed to develop and validate an ethical behavior intention instrument for medical students, based on the theory of planned behavior.

Instrument & Methods In this cross-sectional study, an item pool was generated based on an extensive literature review. Then, psychometric features, such as face validity (qualitative and quantitative), content validity (qualitative and quantitative), item analysis, and construct validity (exploratory factor analysis) were evaluated. Finally, the reliability was assessed using internal consistency (Cronbach's alpha).

Findings A total of 200 medical students filled out the questionnaires, with a mean age of 21.84±4.47 years. In face validity, content validity ratio, and item analysis, six, nine, and three items were removed, respectively. In the exploratory factor analysis, six factors of gaining informed consent, accepting role limitations and collaborating with the treatment team, respect for colleagues and professors, abstract norms, perceived behavior control, and respect for patient values, needs, and culture together explained 51.128% of the total variance. Moreover, seven items were not included in any factor. The internal consistency of the entire questionnaire and its dimensions was acceptable.

Conclusion The ethical behavior intention scale, which is designed based on the theory of planned behavior, is a valid and reliable scale that covers and measures the standards of professional ethics in medical students.

Keywords Behaviour; Intention; Theory of Planned Behaviour

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Introduction

The ethical framework within science and higher education is shaped by internal scientific and professional norms, as well as a sense of moral obligation held by professionals and their respective institutions. This framework is built upon a professional self-understanding that goes beyond the mere pursuit of scientific business. The development of values and morals within scientific professional ethics is not imposed from extrinsic sources of authority but rather emerges organically through the spontaneous activities of professional institutions within universities. Various terms and concepts have been considered in the compilation of ethical codes and standards. Professionalism encompasses ethical issues and questions, as well as the principles for ethically evaluating professional systems, including the field of medicine. It examines the voluntary actions of professionals within the scope of their professional activities [1]. Universities, as institutions responsible for the production and dissemination of knowledge, as well as the provision of specialized human resources in society, must continuously assess their current state and analyze pertinent issues to identify practical solutions to improve the quality of education [2].

The concept of professionalism has long been recognized and emphasized in various countries and professions, leading to the development of ethical codes and standards. Universities of medical sciences have a crucial role in training doctors and medical personnel who, upon graduation, are expected to contribute to the improvement of societal health by fulfilling their professional duties and adhering to specific principles. However, it is evident that medical education alone is insufficient to shape a well-rounded and competent doctor, and the inclusion of ethics is essential [3]. The lack of spiritual ethics content, functional guidelines, and specific professional rules is one of the reasons behind the failure to instill ethical virtues in medical education canterers [4].

Bagheri also highlighted the importance of ethical considerations in medical education as one of the top ten priorities in a national study conducted from the perspective of scholars in the field of medical ethics in Iran [5]. Throughout their schooling, medical students unconsciously develop a particular attitude toward patients and diseases, a mindset that often takes shape during clinical training [6]. Given the increasing prevalence of moral dilemmas, the promotion of professionalism among students has become of utmost importance [7]. The prevalence of moral problems has increased, and it is crucial to address this issue. If professional beliefs and behaviors are not instilled during schooling, it can lead to a decline in students' moral sensitivity, making it challenging for them to make ethical decisions in the future. The formation of professional

values is expected to occur during education and patient care. However, studies have indicated that students' values change their academic education, with negative values potentially replacing positive ones [8]. Students regularly encounter various demands that require them to make appropriate decisions based on their circumstances. A significant aspect of these decisions is rooted in the moral principles individuals acquire throughout their personal development. Within the university environment, students confront situations and demands that elicit various ethical and unethical behaviors. In this context, academic ethics refers to the extent, to which individuals align their actions with values, such as honesty, relying on personal effort, avoiding the misuse of others' resources and efforts, engaging in altruistic and virtuous behavior toward others, and demonstrating respect [9].

Education encompasses academic ethics and has evolved to include a specific focus on academic ethics. The purpose of education extends beyond simply understanding the meaning and rules of ethics within specific domains; it also aims to shape individuals who will serve as future role models within society [10]. An individual's moral behavior is a product of their intention to engage in such behavior. Recognizing the significance of intention in predicting and adopting behavior, the researchers in this study sought to design a questionnaire based on one of the widely accepted and reliable models in the field of behavior prediction. The theory of planned behavior (TPB), a socio-cognitive theory that builds upon the theory of reasoned action, offers a comprehensive framework to evaluate the beliefs, values, and attitudes that influence the moral behavior of medical students [11].

Ajzen and Fishbein proposed that the primary objective of the TPB is to predict behavior and understand the underlying reasons behind it. The central hypothesis of this theory states that people's behavior is influenced by their intentions, which in turn, are shaped by their attitudes, subjective norms, and perceived behavioral control. Attitude refers to the positive or negative evaluation of a behavior, influenced by the individual's assessment of the consequences associated with that behavior (behavioral beliefs). Subjective norms are influenced by the opinions and beliefs of others, while perceived behavioral control is related to an individual's perception of their ability to perform a behavior (self-efficacy and past experiences) [12]. The teaching of ethics in medical universities holds significant importance. However, the implementation of professional ethics interventions necessitates valid tools that can comprehensively measure and evaluate the multiple dimensions of ethical behavior from a broader perspective. Shakur *et al.* examined the existing tools used to assess professional ethics in medical students in clinical settings.

Their findings revealed that no single tool comprehensively covers the various dimensions of professional ethics in medical students [13]. Similarly, Kwan *et al.* conducted a systematic review of existing tools utilized to measure professionalism in medicine and concluded that only two tools demonstrated suitable psychometric properties for measuring professionalism [14].

Therefore, to contribute to the advancement of professional ethics and enhance awareness of the fundamental principles and values of professional ethics, this study aimed to design and validate an instrument to measure intentions toward ethical behavior based on the TPB in medical students.

Instrument and Methods

Design and Setting

This cross-sectional and methodological study aimed to develop and validate a questionnaire to measure the ethical behavior intention of medical students based on the TPB in 2021. The sample included 200 medical students of the Kurdistan University of Medical Sciences, who were selected by convenience sampling method. The inclusion criteria were willingness to participate in research and being engaged in studies at the time of study. Incomplete questionnaires were excluded from the study.

Since ethical attitude as well as other factors contribute to the formation of ethic-based professional behavior, the present study employed the TPB model, which is used for item generation and instrument structuration. Factors, such as students' beliefs about the acquisition of patients' informed consent achieved before performing the treatment, acceptance of individual role restrictions as students, interaction with the treatment team, and respect for the values and needs of patients were considered as attitude construct.

In addition, items, such as adherence to professional behavior, its ease and difficulty as well as individuals' control over adherence to professional behavior were taken as perceived behavioral control construct. Furthermore, professors' expectations of medical students' professional behavior, its significance, and the gaining of social acceptance from the medical team were considered subjective norm construct.

Item Generation

Initially, a comprehensive literature review was conducted to identify relevant studies on professional ethics and available scales to measure professional ethics in medical students. Based on the findings, two researchers collaborated to compile a pool of potential items.

The research team then critically reviewed and evaluated the pool of items removed irrelevant ones, and merged similar items. Ultimately, a draft questionnaire consisting of 48 items was developed.

Face Validity

Face validity was evaluated both qualitatively and quantitatively. Ten medical students were selected to review the questionnaire and provide feedback on its difficulty level, potential ambiguity, and irrelevance [15]. Quantitative face validity was evaluated by calculating the impact score for each item. The impact score was calculated as follows: frequency (%) × suitability. An impact score above 1.5 was considered acceptable [16]. At this stage, the same ten participants were asked to rate the importance of each item on a five-point Likert response (5=completely suitable, 4=suitable, 3=almost suitable, 2=a little suitable, and 1=not suitable).

Content Validity

Content validity was evaluated through both qualitative and quantitative methods. Five experts, including one medical ethics expert, two medical education experts, and two methodologists, assessed the content of the questionnaire. They evaluated aspects, such as grammar, appropriate phrasing, and word placement. In the quantitative stage, the content validity ratio (CVR) was calculated. The necessity of each item was determined using the Lawshe table, where experts categorized items as "necessary," "unnecessary but useful," or "unnecessary." The CVR was computed using the formula $CVR = \frac{n_e - N/2}{N/2}$, where n_e represents the number of experts who selected the "necessary" option and N is the total number of experts. Based on the Lawshe Table and the number of expert panels, the CVR of each item was determined [17]. Then, the content validity index (CVI) was calculated following Waltz and Bausell's recommendation. Experts were asked to rate the relevance of each item on a four-point Likert scale: "irrelevant", "requires general revision", "relevant but requires a brief revision", and "completely relevant". The CVI for each item was determined by dividing the total number of experts who selected either "completely relevant" or "relevant but requires brief revision" by the total number of experts [18]. A CVI score of 0.79 or above was considered acceptable [19].

Item Analysis

Prior to conducting construct validity, item analysis was performed. This involved examining inter-item correlations, which measure the degree of correlation between the scores of each item and the scores of other items within the same instrument. Additionally, item-total correlations were assessed to determine the correlation between the score of each item and the total score of the instrument. Correlations below 0.3 were considered unfavorable [20, 21].

Construct Validity

Data analysis was done by SPSS (version 16) software. To assess construct validity, exploratory factor analysis was employed. There is a divergence of opinions regarding the appropriate sample size for this analysis. Some suggest that 5-10 samples per

item are necessary, while others recommend a sample size of 150 to 300 individuals as appropriate, and 300 to 500 individuals as optimal [22-24]. Kaiser-Mayer-Olkin (KMO) index and Bartlett's test were used to assess the suitability of the data for factor analysis [25]. The KMO index indicates the sufficiency of the sample size for conducting the analysis, with values between 0.7 and 0.8 considered good, and values between 0.8 and 0.9 considered excellent [26]. Exploratory factor analysis was done with the maximum likelihood method and Promax rotation. The number of factors extracted was determined based on eigenvalues greater than one and the scree plot. A loading value of 0.40 or higher was considered acceptable [27]. A higher loading value indicates a better representation of the variables by the extracted factors [28].

Reliability

To assess reliability, internal consistency was estimated based on Cronbach's alpha coefficient. Cronbach's alpha coefficient above 0.7 is acceptable [21].

Ethical Considerations

This research project (960360) received approval from the National Strategic Research Center for Medical Education. Before the study, the objectives were clearly explained to the participants. The questionnaires were distributed anonymously, and participants were assured that their information would be kept confidential.

Findings

The study sample consisted of 200 medical students, with a mean age of 21.84 ± 4.47 years. The majority of

the participants were male (55.5%) and single (96%), of whom 72.5% were day quota and the rest were free quota students. Moreover, 55.5% were students of basic sciences, 28% were physio-pathologists, 12.5% were externs, and 4% were interns.

Face and Content Validity

In face validity, six items were removed due to their low impact scores. In the CVR assessment, nine items were removed. However, none of the items were deleted based on the CVI evaluation. After item analysis, three items were removed, and 30 items remained.

Construct Validity

The KMO index was equal to 0.909, and Bartlett's sphericity test yielded a significant result ($X^2=2882.327$, $df=435$, and $p=0.001$). In the exploratory factor analysis, six factors were extracted: gaining informed consent, accepting the limitations of the role and interacting with the treatment team, respect for colleagues and professors, abstract norms, perceived behavior control, and respecting the patient's values, needs, and culture. These factors had eigenvalues of 11.028, 1.957, 1.556, 1.358, 1.161, and 1.128, respectively, and explained 51.128% of the total variance. Seven items were not included in any factor (Table 1).

Reliability

The results of the internal consistency evaluation showed that Cronbach's alpha coefficient of the dimensions of this scale was above 0.70 and acceptable. Cronbach's alpha coefficient of the dimensions of the questionnaire varied between 0.714 and 0.814.

Table 1. Exploratory factor analysis of the Persian version of the medical student's ethical behavior intention scale

Factor	Items	Factor loading	h^2	% variance	Eigenvalue	Internal consistency (Cronbach's alpha)
Acquiring informed consent	1. Medical students should obtain informed consent from the patients before initiating any therapeutic intervention.	0.630	0.503			
	2. Medical students should respect the patient's right to provide personal information to the treatment team.	0.597	0.542			
	3. Medical students should obtain the consent of unconscious or poorly conscious patients or their guardians before performing a treatment or test.	0.496	0.400			
	4. Medical students should inform patients that they have the right to withdraw from treatment at any stage without requiring approval from the treatment team.	0.466	0.234	35.016	11.028	0.714
	5. Medical students should not initiate any treatment process for patients without the order of a specialist, except in emergency cases.	0.416	0.360			
Accepting limitations and interacting with the treatment team	6. Medical students should not provide advice or information beyond their knowledge and experience to patients and should refer them to a specialist.	0.599	0.404			
	7. Medical students have the right to refuse participation in any procedure that contradicts their moral conscience.	0.551	0.374			
	8. In research and clinical activities, medical students should follow research principles and prioritize patients' well-being.	0.541	0.684			
	9. Medical students should ensure their physical and mental health and avoid contact and interaction with patients if any problems interfere with their role.	0.513	0.412	4.734	1.957	0.813
	10. Medical students should not provide medical and diagnostic information to patients until it has been confirmed by relevant medical specialists.	0.510	0.412			
	11. In case of communication issues with the patients, medical students should ensure that the necessary information will be provided.	0.449	0.535			

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Respect	12. Medical students should respect their professors.	0.882	0.771			
	13. Medical students should respect doctors, nurses, and other treatment members.	0.794	0.634			
	14. Medical students, regardless of their skill, knowledge, and experience, should not present themselves as the most competent and superior person in the treatment team.	0.613	0.490	3.584	1.556	0.792
subjective norms	15. Medical students should adhere to professional ethics because it is important for their professors.	0.726	0.490			
	16. Compliance with professional ethics helps medical students gain social acceptance and respect.	0.651	0.538	3.083	1.358	0.731
	17. The hospital staff and treatment team expect medical students to adhere to professional ethics.	0.642	0.532			
Perceived behavior control	18. Adhering to professional ethics is considered easy for medical students.	0.874	0.714			
	19. Adhering to professional ethics lies in the control of medical students.	0.775	0.625	1.161	2.531	0.814
	20. Medical students should interact with patients and colleagues based on the principles of professional ethics.	0.547	0.604			
Respecting the patient's values, needs, and culture	21. Medical students should respect the patient's nationality and religion throughout the entire treatment process.	0.755	0.548			
	22. Medical students should respect the patient's values and cultural beliefs throughout the entire treatment process.	0.663	0.459	1.128	2.179	0.759
	23. Medical students should consider and address the individual needs of patients throughout the entire treatment process.	0.488	0.640			

Discussion

This study aimed to develop a specific questionnaire to measure the ethical behavior intention of medical students. Given the significant socioeconomic differences between medical students, professors, and staff, it is important to design an instrument that specifically assesses the professional ethics of medical students. However, our research team found a lack of standard and valid questionnaires available for measuring the ethics of medical students.

Ethics encompasses the minimum standards of ethical behavior, while professionalism encompasses the highest standards of professional ethics. Many definitions of professional ethics highlight the importance of attitude, which plays a central role in decision-making and subsequent behavior. According to the Royal College of Physicians (RCP), professional ethics is a combination of attitudes, values, and behaviors that form the foundation for society's trust and belief in physicians. An ethical attitude, when combined with other elements, contributes to the development of professional behavior based on ethics. This behavior includes ethical functioning, clinical competence, effective communication skills, and social responsibility. Such an attitude is deeply rooted in human values, such as honesty, empathy, compassion, and respect. Moreover, medical educators should not only focus on the development of technical skills but also place systematic emphasis on the development of attitudes, an area that is often overlooked [29].

In their study, Rees and Knight proposed the use of the TPB in studies related to professionalism [30]. In the present study, a six-factor questionnaire consisting of 23 items was designed, which accounted for 51.128% of the total variance. The first factor, gaining informed consent, comprised five items and explained the highest percentage of the overall variance. This factor pertains to the importance of

obtaining a patient's consent before initiating any therapeutic intervention. Informed consent is a legal and ethical process, in which the patient or his/her legal guardian acknowledges and agrees to the proposed treatment plan [31]. Silva defines informed consent as a process that aims to promote individual health and respect human autonomy and choice [32]. Informed consent encompasses six conditions, including the provision of information, understanding, voluntariness, decision-making authority, signing the consent form (or providing oral consent), and effective doctor-patient interaction and communication. It is important to note that consent must be accompanied by awareness in order to retain its moral and legal significance [33-35]. Consent without awareness loses its moral and legal meaning [36].

The second factor, "acceptance of role limitations and interaction," consisted of six items and focused on recognizing and accepting the limitations of one's role, as well as effectively interacting and communicating with the treatment team. Medical students need to be aware of the boundaries of their role as students and operate within the defined framework established by the educational system. Therefore, medical students mustn't exceed their knowledge and experience by providing advice or information to patients, but rather refer them to specialists. Additionally, except in emergency cases, medical students should not initiate any form of treatment for patients, but instead guide them towards finding a specialist or a qualified professional [37].

Maintaining appropriate interaction with the medical team is essential to minimize errors, enhance patient safety, reduce unnecessary utilization of medical resources, and ultimately improve service quality. Klemenc-Ketis and Vrecko identified the professional relationship as one of the extracted factors, which aligns with the professional interaction factor

identified in our present study [38]. While the factor of professional development and responsibility was not specifically identified in our study, Aramesh *et al.* and Arnold *et al.* identified the excellence factor, and Blackall *et al.* identified the enrichment factor, which is in line with the concept of professional development [39-41]. Medical students should demonstrate respect toward their professors for their dedication to medical education. In case of any problem with the treatment staff, it is recommended that students discuss the problem with their professors and treating physicians [37].

The fourth factor, "subjective norms," assessed the significance of adhering to professional ethics. Subjective norms refer to an individual's beliefs about the most important individuals in their life and their expectations regarding the desired behavior. For instance, a student may believe that behaving professionally and ethically will lead to a better position in their work environment. This factor serves as a secondary predictor of behavioral intention. When forming a mental norm, individuals consider the normative expectations of others in their lives. In the context of professionalism, medical students need to evaluate subjective norms to align their behaviors with the principles of professional ethics [42]. According to Pololi *et al.*, the integration of professional ethics into the medical curriculum poses significant challenges. Clinical professors at higher levels of medical education may struggle to serve as role models for the professional ethics values they have taught to medical students at lower levels [43].

The fifth factor also pertained to the medical students' perceived behavior control. Perceived behavior control refers to the extent, to which an individual feels and behaves in accordance with established behavior. This factor is influenced by control beliefs and perceived power structures. Control beliefs encompass internal or external factors that can hinder or facilitate behavior. For example, one student may believe that he/she can behave ethically consistently, while another student may believe that he/she can adhere to moral principles only under certain circumstances. Perceived power refers to an individual's perception of the ease or difficulty of engaging in a particular behavior [44]. In a study by Millstein, the behavioral intention model was utilized to predict the behavior of doctors involved in educating adults about AIDS. The results indicated that doctors who believed they had sufficient control over the educational process not only had higher intentions to educate patients but also delivered training at higher quality levels. These findings underscore the effectiveness of the behavioral intention model in predicting physicians' behavior [45].

The sixth factor focused on respect for the patient's values, needs, and culture. Medical students must demonstrate respect for the patient's needs, values, and cultural background during their clinical

training, regardless of the patient's race, nationality, or religion. Furthermore, discrimination based on factors, such as age, sex, economic status, political affiliation, social standing, or health condition should be avoided. Imposing the values and beliefs of medical students on patients falls outside the ethical framework, and the patient's autonomy should be respected [37]. In the previous studies, factors such as altruism and respect for human dignity (honor/integrity, altruism/respect) were identified, which share a conceptual affinity with the concept of respect for the patient's values, needs, and culture in our present study [39-41]. Klemenc-Ketis and Vrecko identified factors, such as empathy and humanism, which align closely with the concept of respecting the patient's needs in our study [38].

In a review of studies on the development of instruments or models for ethical behavior intention, a study conducted at the University of Berlin utilized the TPB to model the ethical intentions of psychiatrists. In this study, 395 psychiatrists completed a questionnaire based on ethical scenarios that included two problems, namely bilateral behavior and financial issues. The moral structure was incorporated into the model. The results indicated that attitude was the strongest predictor of ethical behavior, while abstract norms only showed a significant relationship with financial problems [46]. Emadzadeh *et al.* developed a framework to measure professionalism based on the perspectives of authorities using the Q method. This framework measured factors related to professionalism under headings, such as individual capacity and attention to culture, knowledge, medical skill, and responsibility, managerial skill and preserving human dignity, organizational commitment and excellence, respecting the rights of others and conscientiousness, and the rule of law, communication skills, and altruism [47].

In order to develop a comprehensive instrument that encompasses the highest standards of professional ethics for medical students, codes of professional ethics from various regions worldwide are collected. The TPB was chosen as the theoretical framework due to its coherent structure and applicability to this research. The TPB emphasizes the significance of behavioral intention as the primary driver of behavior, which is influenced by personal and social factors. This aligns with the intention of medical students to engage in ethical behavior. The limitation of this study was the lack of evaluation of the stability of the questionnaire.

Conclusion

The developed instrument effectively covers the maximum standards of professional ethics for medical students. By utilizing the TPB and incorporating global codes of professional ethics, this instrument provides a robust framework to guide

medical students in their ethical decision-making and conduct.

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References

- Farastkhah M. The role of academic ethics in promotion of higher education. *J Ethics Behav.* 2007;27(1):24-7. [Persian]
- Fasihi Harandy T, Soltani Arabshahi K. A survey of input and process of clinical education in Iran University of Medical Sciences. *Payesh.* 2003;2(2):127-32. [Persian]
- Andersson H, Svensson A, Frank C, Rantala A, Holmberg M, Bremer A. Ethics education to support ethical competence learning in healthcare: An integrative systematic review. *BMC Med Ethics.* 2022;23(1):29.
- Pellegrino ED, Thomasma DC. The virtues in medical practice. Oxford: Oxford University Press; 1993.
- Bagheri A. Priorities of medical ethics: Results of a national study. *J Med Ethics Hist Med.* 2010;4(5):39-48. [Persian]
- Pauli HG, White KL, McWhinney IR. Medical education, research, and scientific thinking in the 21st century (part one of three). *Educ Health.* 2000;13(1):15-25.
- Martins VSM, Nogueira Costa Santos CM, Bataglia PUR, Figueiredo Duarte IMR. The teaching of ethics and the moral competence of medical and nursing students. *Health Care Anal.* 2021;29:113-26.
- Boudoulas KD, Geleris P, Boudoulas H. Medical education: eternal values. *Hellenic J Cardiol.* 2012;53(3):173-8.
- Golparvar M. The relationship between ethics and justice education with the avoidance of deception. *Ethics Sci Technol.* 2010;5(2-1):57-66. [Persian]
- Miori VM, Doyle KA, Campbell K. Gender differences in academic ethics with recommendations for curricular change. *J Coll Teach Learn (TLC).* 2011;8(3).
- Alipourdarvish Z, Dolatabadi R. Offering a model on factors affecting physicians' knowledge-sharing intention based on the theory of planned behavior in teaching hospitals affiliated to Tehran University of Medical Sciences. *Hosp J.* 2013;11(4):35-44. [Persian]
- Ajzen I, Fishbein M. Understanding attitudes and predicting social behavior. London: Pearson; 1980.
- Shakour M., Badrian M. Assessment of professionalism between medical students in clinical situations. *Int J Med Invest.* 2015;4(2):199-207.
- Kwan Y, Png K, Phang JK, Leung YY, Goh H, Seah Y, et al. A systematic review of the quality and utility of observer-based instruments for assessing medical professionalism. *J Grad Med Educ.* 2018;10(6):628-38.
- Lacasse Y, Godbout C, Series F. Health-related quality of life in obstructive sleep apnoea. *Eur Respir J.* 2002;19(3):499-503.
- Bolarinwa OA. Principles and methods of validity and reliability testing of questionnaires used in social and health science researches. *Niger Postgrad Med J.* 2015;22(4):195-201.
- Lawshe CH. A quantitative approach to content validity. *Personnel Psychol.* 1975;28(4):563-75.
- Lenz ER. Measurement in nursing and health research. New York: Springer Publishing; 2010.
- Polit DF, Beck CT. The content validity index: Are you sure you know what's being reported? Critique and recommendations. *Res Nurs Health.* 2006;29(5):489-97.
- Boateng GO, Neilands TB, Frongillo EA, Melgar-Quinonez HR, Young SL. Best practices for developing and validating scales for health, social, and behavioral research: A primer. *Frontiers Public Health.* 2018;6:149.
- DeVellis RF. Scale development: theory and applications. New York: SAGE Publications; 2003.
- Mundfrom DJ, Shaw DG, Ke TL. Minimum sample size recommendations for conducting factor analysis. *Int J Test.* 2005;5(2):159-68.
- Munro BH. Statistical methods for health care research. Philadelphia: Lippincott Williams & Wilkins; 2005.
- Shrestha N. Factor analysis as a tool for survey analysis. *Am J Appl Mathematics Statistics.* 2021;9(1):4-11.
- Nunnally JC. Psychometric theory-25 years ago and now. *Educ Res.* 1975;4(10):7-21.
- Nia HS, Ebadi A, Lehto RH, Mousavi B, Peyrovi H, Chan YH. Reliability and validity of the Persian version of temple death anxiety scale-extended in veterans of Iran-Iraq warfare. *Iran J Psychiatry Behav Sci.* 2014;8(4):29-37.
- Osborne JW. Best practices in quantitative methods. New York: SAGE Publications; 2008.
- Vakili MM, Hidarnia AR, Niknami S. Development and psychometrics of an interpersonal communication skills scale (ASMA) among Zanjan health volunteers. *Hayat.* 2012;18(1):5-19. [Persian]
- Smith RC, Dorsey AM, Lyles JS, Frankel RM. Teaching self-awareness enhances learning about patient-centered interviewing. *Acad Med: J Assoc Am Med Coll.* 1999;74(11):1242-8.
- Rees CE, Knight LV. The trouble with assessing students' professionalism: Theoretical insights from sociocognitive psychology. *Acad Med.* 2007;82(1):46-50.
- Taghaddosinejad F, Akhlaghi M, Yaghmaei A, Hojjati A. A survey of obtaining informed consent and acquit from admitted patients in Emam Khomeini hospital. *Iran J Forensic Med.* 2008;14(1):12-7. [Persian]
- Silva MC. Competency, comprehension, and the ethics of informed consent. *Nursingconnections.* 1993;6(3):47-51.
- Parsapour A, Parsapour MB, Larijani B. Informed consent, contents, conditions and practical methods. *Iran J Diabetes Metabolism.* 2005;5:1-14. [Persian]
- Pier M. Medical ethics: Patients' rights. In: Khazanedari S translator. Tehran: Education Development Center of

Shaheed Beheshti University of Medical Sciences; 2003. p. 81-93. [Persian]

35- Simon CM, et al. Comparison of the informed consent process for randomized clinical trials in pediatric and adult oncology. *J Clin Oncol*. 2004;22(13):2708-17.

36- Amini M, Moosavi SM, Mohammadnejad SM. The informatory of the inpatients' informed consent: A survey in selected hospitals. *Iran J Med Ethics History Med*. 2009;2(3):61-70. [Persian]

37- Association AM. AMA code of ethics 2004. Editorially revised 2006. Revised 2016. Canberra: Australian Medical Association; 2004. p. 20.

38- Klemenc-Ketis Z, Vrecko H. Development and validation of a professionalism assessment scale for medical students. *Int J Med Educ*. 2014;5:205-11.

39- Aramesh K, Mohebbi M, Jessri M, Sanagou M. Measuring professionalism in residency training programs in Iran. *Med Teach*. 2009;31(8):e356-61.

40- Arnold EL, Blank LL, Race KE, Cipparrone N. Can professionalism be measured? The development of a scale for use in the medical environment. *Acad Med*. 1998;73(10):1119-21.

41- Blackall GF, Melnick SA, Shoop GH, George J, Lerner SM, Wilson PK, et al. Professionalism in medical education: the

development and validation of a survey instrument to assess attitudes toward professionalism. *Med Teach*. 2007;29(2-3):e58-62.

42- Pakpour Haji Agha A, Ghafranipour F, Heydarnia A, Safari M, Shojaeizadeh D. Theories Models and methods of health education and promotion. Tehran: Aasar-E Sobhan Publishing; 2009. p. 22-4. [Persian]

43- Pololi M, Frankel RM, Clay M, Jobe AC. One year's experience with a program to facilitate personal and professional development in medical students using reflection groups. *Educ Health*. 2001;14(1):36-49.

44- Ajzen I. The theory of planned behavior. *Organizational Behav Human Decision Processes*. 1991;50(2):179-211.

45- Millstein SG. Utility of the theories of reasoned action and planned behavior for predicting physician behavior: A prospective analysis. *Health Psychol*. 1996;15(5):398-402.

46- Ferencz-Kaddari M, Shifman A, Koslowsky M. Modeling psychologists' ethical intention: Application of an expanded theory of planned behavior. *Psychol Rep*. 2016;118(3):691-709.

47- Emadzadeh A, Farzad F, Gholami H, Bahari A, Zarezadeh Y. Development of a framework for assessing professionalism in medical students. *Future Med Educ J*. 2014;4(1):8-12.