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Situational judgment test in pharmacy education: assessing professionalism capability among students

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Abstract

Objective Situational Judgment tests are recognized as a valid predictor of job performance. In the present study, the students' professionalism capabilities were investigated using the situational judgment test. This cross-sectional study was conducted in 2023–2024. The situational judgment test includes four scenarios in the faculty situation (classroom) and six scenarios in the workplace situation in the field (hospital and urban pharmacy) with the format of "selected-response format" examined. 160 pharmacy students in different academic years participated. The cut-off scorer of situational judgment test was determined using the Cohen method and the norm–reference method of standard-setting.

Results The results showed that the scores of students in the situational judgment test were reported as 14.13 ± 6.07. According to Cohen's method, the score of 60 pharmacy students (50%) is lower than the cut-off score. The cut-off score based on the norm–reference method of standard-setting showed that 33 students (20.6%) scored below the cut-off score. The results showed that the students who participated in the professionalism course scored an average of 2.62 higher than the students who did not participate in these training courses. (p-value = 0.015). The development of professional education as a longitudinal program in the pharmacy curriculum is suggested.

Keywords Pharmacy, Situational judgment test, Professionalism, Ethics

Introduction

The expanding roles of pharmacists in society, hospitals, and the pharmaceutical industry have amplified concerns regarding the ethical and professional dimensions of pharmaceutical service delivery [1, 2]. Two conceptual frameworks, termed the "umbrella model" and the "bicycle wheel model," were proposed to delineate the characteristics of professionalism in pharmacy. The American College of Clinical Pharmacy (ACCP), through the "Bicycle Wheel Model," identifies respect for others, honesty and integrity, responsibility, excellence, care, and patience as core components of professionalism in pharmacy [3]. Wilson et al. highlight the importance of delivering patient-centered services within the professional practice framework [4].

Ethical dilemmas, such as ensuring patient rights and satisfaction, balancing business interests with pharmaceutical services, dispensing non-prescription drugs, maintaining scientific integrity in decision-making, and addressing gaps in pharmacists' ability to provide patient advice, have added complexity to the profession [2, 5].

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Kruijtbosch and colleagues have classified the ethical dilemmas in pharmacy into three categories: [1] the pharmacist-patient relationship (e.g., drug abuse or addiction, misuse of medications, deviations from treatment preferences, aggressive patient behavior, and patient privacy concerns); [2] the pharmacist-colleague relationship (e.g., disruptive behavior by physicians or colleagues, strained relationships with physicians, deviating from prescriptions in the absence of a physician, missing patient data, loyalty conflicts, and physician self-prescribing); and [3] relationships with external parties (e.g., reimbursement for pharmaceutical products or care, dispensing without a prescription, and quality defects) [1].

The Royal Pharmaceutical Society of Great Britain has emphasized a growing need for effective training and robust assessment methods to evaluate professional competencies in pharmacy education [4]. Dubbai et al. [3] in a review study identified a limited number of instruments, with only two tools designed to evaluate professional behavior and two others focused on assessing professional attitudes. This scarcity of tailored assessment tools underscores the need for the development of instruments that address the students' decision-making and judgment skills in the pharmaceutical environment. Recent studies recommend the development of tools to assess judgment and decision-making within the domain of professionalism [6, 7].

Situational judgment test (SJT) for professionalism assessment This test measures procedural awareness by examining how individuals identify effective behaviors in specific scenarios. Furthermore, it evaluates how examinees respond to situations they are likely to encounter in their future professional careers [8–10]. SJTs as a practical method for addressing challenges related to professionalism evaluate individuals' responses to realistic, context-specific scenarios that mirror workplace dilemmas. Empirical evidence supports the utility of SJTs in assessing professionalism. Sahota et al., [11]. found that lower SJT scores were significantly associated with a higher risk of professionalism concerns among students. The design of SJTs is based on a detailed analysis of real-world job responsibilities, ensuring they accurately reflect the duties, tasks, and abilities required for specific roles. This alignment makes SJTs a relevant and effective tool for assessing professional competencies, as they evaluate how individuals apply their knowledge and skills in realistic, context-specific scenarios [8, 10].

SJTs are becoming increasingly popular in the medical field [12]. However, the application of SJTs in pharmacy remains limited and requires expansion. The use of the SJT to evaluate the decision-making skills of pharmacy students offers important insights into their current judgment capabilities. This approach not only enhances the understanding of their judgment capabilities but also supports the development of targeted strategies to strengthen these skills. In light of the limited research on situational judgment ability within the field of pharmacy, this study was undertaken to address this gap and contribute to the existing body of knowledge. The present study aimed to evaluate pharmacy students' capabilities in professionalism using the SJT.

Method

The cross-sectional study was conducted at Shahid Sadoughi University of Medical Sciences (SSU) in 2023–2024.

Study setting and participants

Study setting The pharmacy curriculum in SSU is defined as a 6-year program. Students as sophomores mainly take basic science courses. The junior students in the 3rd and 4th academic years launched their clerkship courses and the senior students (in the 5th and 6th academic years) participated in the internship courses in the workplace-based training. The junior and senior students acquire the skills necessary to play the role of a pharmacist in various fields such as hospital pharmacies, urban pharmacies, pharmaceutical industries, and pharmaceutical laboratories.

Students participated in a mandatory professional course within the curriculum, which focused on the principles of professionalism and ethics in pharmacy in their 6th academic year. The course covered key concepts such as respect for others, honesty and integrity, responsibility, excellence, care, patient rights, and the legal aspects of pharmacy [3, 4].

Participants The inclusion criteria were defined by the students who passed at least one academic semester. The students who were unwilling to participate in the study and were incomplete on the SJT were excluded. The sample size for this study was determined based on a pilot study, utilizing the parameters $Z = 1.96$, $\sigma = 6$, and $d^2 = 1$. A total of 138 pharmacy students were estimated as the required sample size. To account for a potential 15% attrition rate, 160 students were recruited to participate in the study through stratified random sampling. This method was implemented to ensure adequate representation across all pharmacy courses, as students from various academic levels were included in the sample.

Study measure

The SJT consists of 10 scenarios, four of which are designed in the faculty situation (classroom), and six scenarios are designed in the workplace situation in the field of hospital and urban pharmacy. Each question explains a situation related to professional dilemmas, and

the students have been asked to choose the best solution among the options when facing this situation. (Appendix 1). The response format of the situational judgment questions is a knowledge-based approach. Based on this approach, students are required to choose the best activities for each question. Each question has six options, students are required to choose three options. (the range of each question is 0–3). The range of scores of SJT is 0–30.

The SJT was developed by Alkhuzaee et al., in 2022 in Saudi Arabia. The SJT was designed with a constructed-response format [13]. In the previous study by the author, the psychometric assessment of the SJT was confirmed among the students in the clinical education field in the Iranian context. Furthermore, the format of the questions was modified to a selected-response format based on a knowledge-based approach [14]. In this study, the face and content validity of the test in the pharmacy field were investigated to ensure of internal validity of the study. The face and content validity of the questions were qualitatively reviewed by 12 experts in the field of professionalism, ethics, and pharmacy including 8 faculty members in the School of Pharmacy and 4 experts in the professionalism field participated. The quantitative content validity of the SJT was assessed by two indicators "Content Validity Ratio (CVR)" and "Content Validity Index (CVI)". To determine the CVR, the experts ($n = 12$) were asked to examine each question based on a three-level spectrum (necessary, useful but not necessary, and not necessary). The minimum value of the CVR was determined based on the Lawsche Table [15]. For the CVI, the criterion of "relevance" of each question was evaluated using a four-point Likert scale [16]. The results of the validity assessment were discussed in the expert panel. At this stage, the validity of the selected response format for the SJT was confirmed by experts. The face and content validity of the SJT in this format was supported by the experts' agreement. The CVR showed that according to the Lawsche table, all the questions in this index scored higher than 0.56. The results showed the CVI of all questions obtained values higher than 0.79 and were retained in the SJT. The S-CVI/Ave reported 0.87. Finally, the validity of the tool was confirmed. The reliability of the SJT was evaluated during this phase, with participation from 20 pharmacy students including 10 women (50%) and 10 men (50%) and their average age was 22 ± 2. The internal consistency of the SJT was approved. (Cronbach's alpha = 0.86).

Table 1 Demographic characteristics of the participants

		Frequency	Percentage
Gender	Male	68	42.5
	Female	92	57.5
Academic level	Sophomore	38	23.8
	Junior (Midyear)	53	33.1
	Senior	69	43.1
Participating in the professionalism course	Yes	90	56.3
	No	70	43.8
		Mean	SD
Age		22.80	2.80

SJT examination

A total of 160 students participated in the examination, which was conducted under invigilated conditions. The exam took about 45 min.

After data collection, the minimum pass level was determined through two methods introduced by Cohen et al., and the norm–reference method of standard–setting [17, 18]. The cut-off score based on the norm-referenced method was calculated using minus 1SD and 2SD from the mean [17]. In this study, the use of Cohen's method was suggested. Cohen's method is an integrated norm-referenced and criterion-referenced approach, where 60% of the 95th percentile score is considered the cutoff score [18]. In this study, both methods were used and the results were compared.

Data analysis

The data were analyzed descriptive (percentage, mean, and standard deviation) and inferential statistics (one sample student t-test, independent student t-test, and ANOVA). Regression analysis was also used to examine the association between students' situation judgment scores as a dependent variable and independent variables. The internal consistency of the SJT was evaluated using Cronbach's alpha.

Results

Demographic information of students was reported in Table 1.

The results showed that the student's scores in the situational judgment test were reported as 14.13 ± 6.07. The cut-off score based on the Cohen's method was 14.4. (the 95th percentile of scores = 24 and 60% of the 95% percentile = 14.4). In the norm–reference method of the standard-setting method, the cut-off score was determined as -1SD = 8.05 and −2SD = 1.99. Table 2 reports the students' scores compared with the cut-off scores of the Cohen method and the norm–reference method of standard–setting.

According to Cohen's method, the score of 60 pharmacy students (50%) is lower than the cut-off score and the score of 60 students (50%) is above the cut-off score. In the norm–reference method of standard-setting, by determining the cut-off point by -1 SD, the results showed that 33 students (20.6%) scored below the cut-off score and 127 students (79.4%) scored above the cut-off score. 159 students (99.4%) scored above the cutoff score

Table 2 Comparison of students' scores with the cut-off scores in Cohen methods and the norm–reference method of standard-setting

	Mean	SD*	95% Confidence Interval for Mean		Minimum	Maximum	Cohen method [a]		The norm–reference method of standard-setting		
			Lower Bound	Upper Bound					-1 SD[b]		-2 SD[c]
							P-Value[§]		*P*-Value[§]		*P*-Value[§]
Pharmacy students	14.13	6.07	13.18	15.08	1	29	0.57		**0.0001***		**0.0001***

a: compare the cut-off score by Cohen method 60%*quartile 95%=14.4

b: compare the cut-off score by Using a cut-point of 1 SD below the mean SJT score = 8.05

c: Compare the cut-off score by Using a cut-point of 2 SD below the mean SJT score = 1.99

* SD: Standard Deviation

**is significant

§ One-Sample Student T-Test

and 1 student scored below the cutoff score (0.6%) by the cut-off score of -2 SD. (Table 2).

The results showed that the scores of students in different academic years were significantly different. (p-value = 0.04). The results of Benferroni's post hoc test showed that senior students (5th and 6th of academic years) obtained significantly higher scores than junior students (3rd and 4th academic years). This difference was not significant compared to the scores of sophomore students. (p-value > 0.05). (Table 3).

The results of the regression analysis showed that participation in professional courses had a significant effect on the situational judgment scores of students. The results showed that the students who participated in the professional course scored an average of 2.62 higher than the students who did not participate in these training courses. (p-value = 0.015). The results showed that by controlling the years of study as a covariate, the variable of participating in professional programs had a significant effect on the situational judgment scores of the participants. ($F = 6.04$, $df = 1.15$, p-value = 0.015). The relationship between SJT scores of students with their academic year (p-value = 0.84) and their gender (p-value = 0.87) was not significant. (Table 4).

Discussion

The findings revealed that students' situational judgment scores were below average, and participation in professional training positively influenced their situational judgment performance. Situational judgment tests (SJTs) have increasingly been utilized in entrance examinations [6–8, 19].

The results indicated that half of the pharmacy students scored below Cohen's cut-off score, with overall scores falling below the average. Likewise, Cooper et al. [20] found that nearly 60% of community pharmacists have encountered at least one ethical dilemma; however, 30% of these individuals were unable to accurately identify such situations or determine appropriate responses. Similarly, Rajiah [21] reported that the majority of community pharmacists faced ethical dilemmas at least once a week. Empirical evidence from multiple studies suggests that pharmacists do not consistently make optimal decisions when confronted with ethical challenges. These findings underscore the imperative to integrate training and evaluation of ethical judgment and professionalism into pharmacy education curricula [1, 21, 22].

The findings also revealed that participation in professional training courses significantly influenced students' performance on the SJT. These outcomes underscore the necessity of incorporating comprehensive educational programs on professionalism within the pharmacy curriculum. Potential reasons for the lower scores may include gaps in students' understanding of key

Table 3 Comparison of situational judgment scores of students in different academic years

Academic level	Mean	Std. Deviation	95% Confidence Interval for Mean		Minimum	Maximum	*P*-value*
			Lower Bound	Upper Bound			
Sophomore year	14.02	6.93	11.74	16.30	3.00	29.00	0.04
Junior year (Midyear)	12.62	6.16	10.92	14.32	4.00	25.00	
Senior year	15.34	5.26	14.08	16.61	1.00	25.00	

*ANOVA test

Table 4 The relationship between the scores of the situational judgment test and the variables

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Model 1*					
Academic level	.134	.667	.018	.201	.841
Gender	−.149	.957	−.012	−.156	.877
Participating in a professionalism course	2.623	1.069	.215	2.454	.015
Model 2*					
Participating in a professionalism course	2.713	.947	.222	2.864	.005

* Regression test, R = 0.223, R Square = 0.050, Adjusted R Square = 0.031

**R = 0.222, R Square = 0.049, Adjusted R Square = 0.043

professional competencies, particularly in ethical decision-making, insufficient preparation or training in applying theoretical knowledge to practical, and context-specific scenarios. To address these challenges, targeted strategies suggest including integrating scenario-based training into the curriculum, offering students opportunities to practice and reflect on their responses to professional dilemmas, and fostering a deeper understanding of professionalism through workshops, mentorship programs, and structured assessment and feedback mechanisms. The use of SJT as a formative assessment would help bridge the gap between theoretical knowledge and practical application, ultimately enhancing students' performance on SJTs and their readiness for professional practice. DeLellis et al. highlighted the utility of the SJT as a tool for assessing students' abilities and tracking their progress during pharmacy training. They noted that SJT results can provide valuable insights for reforming educational curricula, as well as extracurricular and informal training programs [6].

The present findings revealed a significant difference in situational judgment scores among students in different years of study, with junior students scoring lower than their senior counterparts. This disparity may be attributed to the fact that junior students, who have recently begun their clerkship courses in hospitals, pharmacies, and industries, have less practical experience compared to senior students. Moreover, factors such as the normalization of unprofessional behaviors, insufficient attention to the developmental aspects of professional behavior in workplace-based learning, weaknesses in evaluation systems, and a lack of constructive feedback within the current educational framework may contribute to the lower scores observed among junior students [23–25]. To address these deficiencies in judgmental competencies, the development and implementation of a longitudinal, theme-based program for professionalism education is recommended. The programs enhance students' analytical and reasoning skills through real-life scenarios, providing a structured learning framework that allows for gradual skill development over time. Incorporating scenario-based learning, reflective exercises, and root cause analysis techniques in small-group settings can help students critically evaluate ethical and analytical dilemmas commonly encountered in pharmacy practice. Root cause analysis, in particular, offers a systematic approach to identifying underlying factors in complex situations, fostering a deeper understanding and more effective problem-solving strategies. Furthermore, creating informal learning opportunities—such as peer discussions, mentorship programs, and real-world case studies—can enrich the learning environment, reinforcing ethical principles and enhancing decision-making capabilities. Similarly, Allinson et al. highlighted the need for pharmacy students and early-career pharmacists to receive support and positive role models to develop professional capabilities and ethical decision-making skills. They identified a lack of confidence in performing professional activities, anxiety about decision-making, and the perceived moral distress of junior pharmacy students as significant challenges [19]. Quinn further emphasized that students in their 3rd to 5th academic years need to take on greater responsibilities in workplace settings and have more opportunities to engage in reflective processes, which help develop their professional competencies [26]. These insights underscore the importance of targeted educational interventions and supportive environments to bridge the gap between theoretical knowledge and

practical application, ensuring the holistic development of future pharmacy professionals.

The scores of junior students were lower than those of sophomore students, although the difference was not statistically significant. This trend raises concerns about a potential decline in sensitivity toward ethical and professional issues as students progress through their academic years in the faculty of pharmacy. Likewise, Cullen et al. [27] demonstrated that overall SJT scores were positively correlated with professionalism ratings of midyear and year-end students. Furthermore, these scores were associated with the likelihood of trainees exhibiting concerning behaviors or requiring active remediation at the midyear point. A decline in students' awareness of ethical issues and an increase in unprofessional behaviors within educational settings are recognized as major challenges in health professions education systems [28, 29]. Peters et al. similarly noted a decline in professional attitudes among young doctors compared to medical students, as well as a deterioration in the attitudes of learners during their academic and clinical training [30]. To address these issues, it is recommended to implement effective training programs focused on professionalism, monitor learners' capabilities using validated assessment tools, and establish counseling and feedback mechanisms to support the development of professional competencies within the faculty of pharmacy [22, 31].

Limitation

The study only included pharmacy students admitted to Shahid Sadoughi University, thus the results can only be generalized to similar pharmacy schools but not students studying other professions. The selected-response format SJT was validated in our context. While the use of the SJT is feasible in similar cultures and regions, its validity requires assessment in different contexts.

Conclusion

The results showed that the scores of the situational judgment test were lower than the average score. Half of the students scored below the cut-off score using Cohen's method. The present results showed that participation in professional training courses had a significant effect on students' situational judgment scores. The Cohen method was suggested as a preferable method to determine the cut-off score in the SJT. It is advisable to plan for the development of professionalism education as a continuous program in the pharmacy curriculum and to establish support mechanisms for junior students who have started their clerkship courses in workplace-based education.

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Author contributions
F.K. conceptualized and designed the study. N.F. collected the data F.K. analyzed and interpreted the data. F.K. and N.F. wrote the main manuscript text. All authors have met the criteria for authorship and had a role in preparing the manuscript. Also, all authors approved the final manuscript.

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Data availability
The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
This study was reviewed by the ethics committee of Shahid Sadoughi University of Medical Sciences and approved. (ID: IR.SSU.REC.1402.085). The informed written consent forms were obtained from all participants. The work was conducted following the Declaration of Helsinki. All participants were provided with information on the study and gave consent.

Consent for publication
'Not applicable'.

Competing interests
There is no conflict of interest in this research to be declared.

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