

Comparison of Knowledge and Attitudes of Medical Students in Externship and Internship Phases toward Persian Medicine at Hamadan University of Medical Sciences

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Received: 2025 February 21

Revised: 2025 October 15

Accepted: 2026 February 07

Published online: 2026 February 07

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Citation:

Meyari A, Mohammadi AH, Biglarkhani M, Jiriae N, Biglarkhani A. Comparison of Knowledge and Attitudes of Medical Students in Externship and Internship Phases toward Persian Medicine at Hamadan University of Medical Sciences. Strides Dev Med Educ. 2026 February; 23(1):e1531.
doi:10.22062/sdme.2026.200944.1531

Abstract

Background: The growing use of complementary and traditional medicine in recent years entails a greater emphasis on this topic within medical education. Thus, it is essential to ascertain and enhance the knowledge and attitudes of medical students towards these therapeutic approaches throughout their education.

Objectives: This study aims to compare the knowledge and attitudes of medical students at Hamadan University of Medical Sciences in their externship and internship stages considering Persian Medicine.

Methods: This descriptive cross-sectional study was undertaken in 2023. The participants were 220 medical students (n=220) in their externship and internship years. The follow-up interval lasted 6-12 months. Data on their knowledge and attitudes were collected via a self-administered questionnaire, which was validated by professors and experts in Persian Medicine and Medical Education. Statistical analysis was performed using SPSS software, version 20, with all comparisons tested at a significance level of $p < 0.05$.

Results: Regarding knowledge, the mean score for the externship group was 5.83 ± 1.43 , while for the internship group, it was 7.06 ± 1.88 ($p = 0.004$). In terms of attitudes, the mean score for the externship group was 43.90 ± 7.690 , and for the internship group, it was 38.27 ± 10.466 . This difference was statistically significant ($p < 0.001$).

Conclusion: The findings suggest that an increase in students' knowledge does not necessarily lead to a corresponding rise in their positive attitudes. Suggesting factors such as clinical exposure, influence of senior physicians, or the mode of education may significantly affect attitudes.

Keywords: Persian Medicine; Knowledge; Attitude; Medical Students

Background

In recent years, the use of Complementary and Alternative Medicine (CAM) has increased for various reasons, with a reported prevalence of 9.8% to 76% of people across different societies (1). This may be attributed to high treatment costs, physicians' high reliance on technology, perceived ineffectiveness of conventional medicine for certain diseases, drug side effects, as well as the accessibility and cultural compatibility of Traditional Medicine. In order to mitigate the risks associated with unguided use, since 2002, the WHO has promoted and advocated for the usage of Traditional and Complementary Medicine

based on scientific evidence (2). Similar to trends observed in many countries, many in Iran choose Traditional Medicine, known as Persian Medicine, over conventional medicine at different stages of treatment (3, 4). Almost half of Iranian patients apply CAM methods as an initial part of their usual treatment (5, 6). Another study also revealed that slightly more than 50% of cancer patients used CAM therapies between 2009 and 2018 (7). Thus, given the societal need for this field, it is essential for physicians to be well-educated in it so that they can apply this knowledge to ameliorate health outcomes. For this reason, the integration of Persian Medicine into medical education

has been undertaken, and since 2017, Persian Medicine (PM) has been included in the curricula of some fields, including medicine, pharmacy, and nursing (8, 9). This education is delivered through both virtual and in-person methods. Given the relatively recent integration of this course unit, a limited number of studies have ascertained these educational initiatives. A study exploring the perspectives of students who had completed this virtual course at Smart University indicated student satisfaction with the educational method and a significant improvement in their attitude toward Persian Medicine (10). Another study at Shiraz University of Medical Sciences observed similar student satisfaction and improved attitudes, particularly among nursing students, following the virtual delivery of the course (11). Further, a 2020 study on the knowledge, attitudes, and practices (KAP) of pharmacy students at Guilan University of Medical Sciences considering traditional and complementary medicine found that students who had completed the Traditional Medicine and Pharmacy unit had significantly greater knowledge than other students (12). Studies undertaken to date have inspected the short-term impact of these trainings immediately after the completion of the course. Since the Persian medicine curriculum is currently offered along the externship period, this study was conducted to compare the perspectives of interns who had completed the virtual Iranian medicine course during their externship with those of externs who had not yet taken the course. This was performed to explore the long-term impact of the training.

Objectives

The purpose of this study is to appraise long-term retention of knowledge and evolution of attitudes following the PM course and compare with externship students.

Methods

Study design and participants: This descriptive-analytic cross-sectional study was conducted in 2023. The participants consisted of medical students at Hamadan University of Medical Sciences in the externship and internship stages. A total of 110 internship students and 110 externship students were selected through convenience sampling. Participation was voluntary. All internship students had completed the virtual Persian Medicine course, while none of the externship students had taken the course.

Data collection: Data were collected by the researcher during in-person visits at the hospitals from intern students and at the medical school following classes

from extern students using a self-developed questionnaire. All students who received the questionnaires completed them thoroughly and handed them in simultaneously. The study included interns who had completed the course and externs who had not, in case they consented to participate. Guest students and those who had previously failed the course were excluded from the study.

Ethical considerations: This study, under the code IR.UMSHA.REC.1401.091, was approved by the research ethics committee of Hamadan University of Medical Sciences. All participants signed an informed consent form to approve their participation.

Instruments

Data were collected using a knowledge and attitude questionnaire developed by the researchers. Ten Persian Medicine and Medical Education faculty members at Hamadan University of Medical Sciences confirmed the content validity of the checklist along with its scoring. The questions were based on the methodology of KAP studies about Persian Medicine performed in Iran. A self-developed questionnaire was employed owing to a scarcity of existing literature on the KAP of university students considering Persian medicine. The questionnaire's validity was confirmed by specialists and instructors of this curriculum. The reliability of the questionnaires was confirmed with a Cronbach's alpha coefficient of 75%. The attitude questionnaire was adapted from a study by Naghibi, originally utilized to appraise the attitudes of medical students and residents (13). Its validity and reliability were confirmed by experts and by applying Cronbach's alpha with a reliability rate of 89%. The questionnaire consisted of two sections: the first for ascertaining demographic information and the second for questions about the students' knowledge as well as attitudes. The knowledge assessment questionnaire contained 11 questions, each with three options: "I agree," "I have no opinion," and "I disagree". Correct answers were assigned 1 point, while incorrect answers received zero points. Thus, for questions 1, 2, 3, 10, and 11, selecting "agree" was assigned one point, while other options received no points. For questions 4, 5, 6, 7, 8, and 9, selecting "disagree" was assigned one point, with no points given for other options. Knowledge questions are outlined in [Appendix 1](#). The maximum possible knowledge score was 11, while the minimum was zero. The attitude questionnaire listed in [Appendix 2](#) consisted of 13 questions graded on a Likert scale from 1 (completely disagree) to 5 (completely agree). The total attitude score ranged between 13 and 65. Questions 1, 2, and 4 were reverse-scored for analysis.

Statistical Analysis: The collected data were recorded in SPSS version 20 statistical software for analysis. Descriptive statistics were employed for variables, and frequencies were presented as percentages, means, and standard deviations in tables. Data analysis was performed using inferential statistics, including the Chi-square test, t-test, Mann-Whitney U test, and Pearson test. The normality of data distribution was appraised using the Shapiro-Wilk test. Accordingly, the independent t-test was applied for parametric variables and the Mann-Whitney U test for non-parametric variables. The Chi-square test was used to determine subgroup differences. The Pearson test was utilized to determine the correlation between variables. All comparisons were conducted at a significance level of 0.05.

Results

The mean age of the participants was 24.52 ± 3.2 years. Of the participants, 45.9% were female and 54.1% were male. Demographic and basic information are reported in Table 1.

The average knowledge score of the internship group was significantly higher than that of the externship group ($p = 0.004$). Conversely, the average attitude score of the internship group was significantly lower ($p < 0.001$).

Table 1. Demographic information of participants

	Students		P value
	Internship stage	Externship stage	
Mean age	25.52 ± 2.4	23.25 ± 3.6	$<0.001^*$
Gender			
Female	46(41.8%)	55(50%)	0.086**
Male	64(58.2%)	55(50%)	

*by using t-test, **by using Chi-square test

No significant differences were found between genders within either group regarding the average knowledge score ($p = 0.703$) and the average attitude score ($p = 0.081$). Table 2 outlines the average scores for each group.

There was a significant but weak direct relationship between knowledge and attitude in both the externship and internship groups ($r=0.227$, $p=0.017$ and $r=0.281$, $p=0.003$, respectively) as determined by the Pearson's test.

Table 2. The average scores of students' knowledge and attitudes in different groups

Group	Externship stage group	Internship stage group	P value
Knowledge score (out of 11)	5.83 ± 1.43	7.06 ± 1.88	0.004
Attitude score (out of 65)	43.9 ± 7.69	38.27 ± 10.46	<0.001

Discussion

The results of this study indicated that the knowledge of the internship students was significantly more developed than that of the externship students. The greater knowledge among interns can be assigned to the Persian Medicine course they had completed. As studies by Banaiyan et al. in 2007 and Naghibi Harat et al. in 2008 have demonstrated, medical students and physicians previously had a low level of knowledge as they had not been educated in Persian Medicine (13, 14). Nevertheless, the studies by Parvinroo et al. in 2020 and Zohalinejad et al. in 2024 revealed that students who had enrolled in the Persian complementary medicine course had significantly greater knowledge than other students (11, 12). A study by Naghibi Harat et al. in 2017 at Tehran University indicated that the knowledge and attitudes of fifth-year medical students and first-year medical assistants toward Persian Medicine were low, and they would not use or recommend it to their patients (13). When compared to the assistants, the students had greater knowledge and were more likely to apply therapeutic methods of Iranian Medicine, which suggests that the further students get from the course in terms of years, the less likely they might apply it to patients (13). Also, our study revealed that the attitude of the internship students was considerably more negative than that of the externship students, despite completing the Persian Medicine course. In contrast to our study, the studies by Habibi et al. and Zohalinejad et al. in 2024 noted that students had favorable attitudes toward the virtual course on Persian & Complementary Medicine at Smart University of Medical Sciences (10, 11). This difference may arise from the fact that their studies were performed immediately after the completion of the course. Our study, however, was conducted between 6 and 12 months after the course was completed. Within this time frame, they may have encountered negative effects from the incorrect usage of Persian Medicine, which is often prescribed by non-physicians. Moreover, an unmeasured but potential influential factor could be the negative attitudes of some attending physicians and residents. Soleimani et al. concluded that residents' attitudes toward Persian Medicine were more negative than those of medical students (15). Knowing that one of the limitations of this study has been its convenience sampling, which could lead to selection bias, our results by revealing a decline in attitude after a virtual course, indirectly support the call for more interactive, in-person formats. As other studies suggest, attitudes would be better modified if the course were held in

person rather than virtually (16). Presumably, face-to-face education is more efficient and can bring about a significant reduction in educational challenges.

Conclusion

This study demonstrated that the two-unit virtual course had significant long-term efficacy in enhancing students' knowledge. Nevertheless, their attitude, when compared to the extern group who had not yet taken the course, not only failed to become more positive but actually became more negative. Hence, based on these findings, it is recommended that this course be continued in the internship period for a short duration. It should also be taught in person via active educational methods such as small group teaching and flipped classrooms. If the course continues to be offered virtually, it is suggested that the use of active, controlled educational methods should be a priority. A key strength of our study is that it was undertaken 6-12 months after the Persian Medicine course, allowing for the evaluation of the long-term effects of this education on students' knowledge, which were found to be admirable, while the long-term effects on students' attitudes were found to be insufficient. The cross-sectional design and convenience sampling were the main limitations of our study.

Acknowledgements: The authors appreciate all individuals who contributed to this work and provided valuable support during the study.

Conflict of interests: There is no conflict of interest.

Ethical approval: This study, under the code IR.UMSHA.REC.1401.091, was approved by the research ethics committee of Hamadan University of Medical Sciences.

Funding/Support: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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Appendix 1. The relative frequency of students' views about each of the knowledge questions in different groups

Knowledge questions	Externship stage group (%)		Internship stage group (%)		P value*
	Correct	Incorrect	Correct	Incorrect	
The main resolution of Persian Medicine is reinforcement of body's natural powers.	40	60	60	40	0.002
Lifestyle modification is the most struggle in Persian Medicine.	62	38	70	30	0.025
Soda (Melancholic) temperament equals for Cold and Dry.	22.7	77.3	42.7	57.3	0.001
The Four Elements is the substructure of Chinese and Persian Medicine.	70	30	61.8	38.2	0.128
The most important principle of Persian Medicine lifestyle is diet.	46.4	53.6	43.6	56.4	0.393
One of Persian Medicine instructions is dairy forbiddance in any conditions.	82.7	17.3	93.6	6.4	0.010
By Ehtebas in lifestyle principles, it means overcoming anger and wrath.	80	20	81.8	18.2	0.432
Estephraq equals for vomiting.	67.3	32.7	73.6	26.4	0.188
Phlebotomy, wet-cupping and leech therapy are the priorities of treatment in Persian Medicine.	80	20	87.3	12.7	0.101
Hijamat equals for wet-cupping.	24.5	75.5	49.1	50.9	<0.001
Acupuncture spots are located on Meridian canals.	12.7	87.3	42.7	57.3	<0.001

*by using Chi-square test

Appendix 2. The relative frequency of students' views about each of the attitude questions in different groups

Attitude questions	Externship stage group (%)			Internship stage group (%)		
	Agree	Neutral	Disagree	Agree	Neutral	Disagree
The effect of Persian Medicine is mostly a placebo effect.	20	66.4	13.6	41.9	23.6	34.5
Persian Medicine is pseudo-science, so it should not be discussed in scientific societies.	30	18.2	51.8	38.2	20	41.8
The use of Persian Medicine methods must be with official permission.	86.3	8.2	5.4	80	8.2	11.9
Academic Persian Medicine is a threat to society's health.	13.6	29.1	57.3	38.8	20.9	47.3
Persian Medicine should be treated scientifically and academically.	66.7	20	13.6	53.7	20.9	25.5
Persian Medicine has fewer complications for the patient.	31.9	25.5	42.8	10.9	24.5	64.6
The tendency of people towards Persian Medicine methods is due to its compatibility with the culture of Iranian people.	60.9	27.3	11.8	52.8	20.9	26.3
Patients prefer this treatment due to more access to Persian Medicine methods.	46.4	20	33.7	48.2	15.5	36.4
The reason for people's tendency towards Persian Medicine is the ineffectiveness of common medicine in the treatment of some diseases.	27.2	21.8	50.9	20.9	19.1	60
Persian Medicine is less expensive for the patient than conventional medicine.	57.2	20.9	21.9	33.7	25.5	40.9
Persian Medicine schools have ideas that mainstream medicine can benefit from	65.4	22.7	11.9	39.1	28.2	32.7
I would like to increase my studies and experiences in Persian Medicine field.	58.2	19.1	22.7	34.6	16.4	49.1
I will use the recommendations of Persian Medicine in my future work.	47.3	29.1	23.6	30.9	20.9	48.2