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Survey of the Medical Sciences Students' Attitude Towards Research

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Abstract

Background: Research is essential for societal development and medical sciences. Medical schools should train researchers and promote a research culture.

Objectives: This study assessed the attitude of medical students at Tabriz University of Medical Sciences (TUOMS) towards research.

Methods: This cross-sectional, comparative study was conducted at Tabriz University of Medical Sciences in 2024. A sample of 682 students was randomly selected, with 609 responding to the questionnaire (response rate: approximately 89.3%). The questionnaire, adapted from Sobczuk et al., explored students' research attitudes. Data analysis involved one-sample T-tests and MANOVA using SPSS 26."

Results: A survey conducted among medical students revealed a generally positive attitude toward research. The item 'We're living healthier and safer with science' received the highest ranking (Mean =3.93±0.955). However, the study also highlighted challenges in research engagement. The most significant barriers identified were a lack of information on scientific work opportunities (Mean = 3.77±1.34) and insufficient funding/grants for research (Mean = 3.74±1.33). Gender and academic semester did not significantly influence attitudes or perceived obstacles, but the field of study played a significant role. Paramedicine students exhibited lower attitudes toward research than Medicine, Dental, and Pharmacology. Additionally, Paramedicine reported more perceived obstacles, supported by statistically significant p-values ($p < 0.001$). Despite the overall positive view, this underscores the need for educational and financial support to encourage active student participation in research."

Conclusion: The findings suggest that the students are interested in research but need more support and guidance. The university should offer courses on research methods, increase awareness of research importance and benefits, provide facilities and resources, and enhance attention from officials and professors.

Keywords: Attitude; Medical Student; Research; Iran

Background

Research is crucial for advancing society and science, especially in medical sciences (1). It aims to generate and apply knowledge that can classify, describe, explain, evaluate, relate, compare, predict, and manipulate various situations, phenomena, and observations (2). Medical universities are responsible for educating future researchers and fostering a research culture in students (3). This allows them to acquire and use knowledge, skills, and attitudes in different areas of medicine (4). However, many students face difficulties and challenges in conducting and completing research projects, such as lack of time, resources, guidance, motivation, and interest (5). Therefore, examining and improving the students' research attitude is vital, as it can influence their research performance, quality, and outcomes (6). The research attitude in health sciences stems from the researchers' curiosity and interest in a topic or their motivation to solve a problem in a community (7). A positive research attitude can enhance the students' research skills (8), such as critical thinking (9), problem-solving (10), creativity (11), and communication (12), and boost their research quality (13), interest and motivation (14). A negative research attitude can hinder the students' research potential and performance

discouraging them from engaging in research activities and opportunities (15).

Students of medical sciences need a positive research attitude, as they will shape the future of the health sector with their discoveries and innovations (16). To achieve this, they need adequate and appropriate research methods teaching that cover both theory and practice of conducting high-quality and ethical studies in various fields of medicine (17). They also need guidance, support, and motivation from their mentors, peers, and institutions, who can offer them constructive feedback, recognition, and access to relevant resources and opportunities (17). Moreover, they must be part of a collaborative and conducive research culture and environment that fosters curiosity, creativity, and critical thinking and values diversity, integrity, and excellence (18). By creating such conditions, students of medical sciences can improve and utilize their research skills and knowledge, and positively impact the medical field and society (19).

Research on students' attitudes towards research (20-24) has highlighted educational gaps and limited participation as significant barriers, with no clear link to gender, knowledge level, or employment status. Asadollahi et al. (25) found that factors like research self-efficacy and academic experiences explain 28% of attitude variance without demographic or academic differences. Babamohammadi et al. (26) observed a positive research attitude among Semnan medical students, with active engagement in research activities but less in publishing or project execution. Razavinia et al. (27) reported that most Qom medical students had a moderate attitude toward research, unaffected by gender or research experience. Abun et al. (28) linked cognitive and emotional attitudes to research intentions. Camacho Torres et al. (29) noted a negative research attitude among higher education students. Sobczuk et al. (30) identified that a third of Warsaw medical students aim for research careers, facing challenges like time and resource constraints. El Achi et al. (31) found a positive attitude but low engagement in research among students at the American University of Beirut, suggesting mentorship improvements. Estrada et al. (32) and Rojas Solis (33) also found a generally negative or neutral research attitude with no gender-based differences. Moradabadi et al. (34) identified a lack of research skills and resources as significant barriers. Marmarpour et al. (35) reported positive attitudes but average knowledge, highlighting obstacles such as lack of support and distrust in domestic research outcomes. Izadi et al. (36) noted a correlation between educational level and research awareness and attitudes, with higher levels correlating with better attitudes and awareness. Cruz et al. (37) and Olivera (38) observed average attitudes toward research, with psychology students showing more positivity than management students. Kyaw et al. (39) identified the main barriers of time, knowledge, budget, facilities, and rewards. Overall, the research indicates that while students generally have positive or average attitudes toward research, they face significant challenges, including a lack of knowledge, resources, and support. These studies collectively underscore the need for better educational support and resources to foster a positive research attitude.

Tabriz University of Medical Sciences (TUMS) is one of Iran's oldest and largest medical universities, with more than 8,000 students in various fields of medicine, dentistry, pharmacy, nursing, midwifery, health, and paramedical sciences (40). TUMS fosters a strong research culture and infrastructure and provides various opportunities and incentives for students to engage in research activities. However, no extensive study has assessed the attitude of TUMS students towards research, and comprehensive and updated data on this issue is lacking.

Objectives

This study aims to fill this gap by exploring the factors that influence the students' attitude towards research and providing valuable insights for improving the quality and quantity of their research performance and development.

Methods

Research Design: This study adopted a cross-sectional descriptive survey to measure the attitude of medical students of TUOMS towards research.

Sampling: "From the total enrollment of 8,602 students during the academic year 2022-2023, we randomly selected 682 participants using Krejcie & Morgan's table (41) and employed a stratified sampling method. These participants provided information on their age, field of study, semester, and gender. Table 1 presents a summary of their demographics:

The mean age is 18.47 years, with a standard deviation of 2.591.

Data Collection: "The Sobczuk et al. questionnaire, customized for the Iranian educational system and culture, underwent a rigorous adaptation process.

Table 1. Demographic characteristics of the sample

Variable		Frequency	Percent
Gender	Male	269	39.44
	Female	413	60.56
Semester	4	149	21.84
	6	153	22.43
	8	165	24.19
	10	111	16.27
	12	63	9.23
	14	27	3.95
	16	9	1.31
	18	5	0.73
Field of Study	Medicine	180	26.39
	Dental	60	8.79
	Pharmacology	150	21.99
	Paramedicine	292	42.81

This involved translation-back-translation to validate its content. Initially, the questionnaire was translated from English to Farsi by a bilingual expert familiar with both languages and the cultural context. A separate bilingual expert, uninvolved in the initial translation, back-translated the Farsi version to English. Discrepancies were checked against the original questionnaire to ensure accuracy. To further validate the questionnaire, a panel of experts in the field assessed its content validity. Additionally, the questionnaire's reliability, assessed using Cronbach's alpha coefficient (0.71), indicated sufficient internal consistency, with the attitude towards the research variable (0.73) and the Obstacles to conducting the research variable (0.7). The 23-item questionnaire used a 5-point Likert scale with scores ranging from 1 (completely disagree) to 5 (completely agree). This allowed for a minimum possible score of 23 and a maximum of 115, quantitatively measuring the students' attitudes and perceived barriers. Demographic data (age, semester, gender, field of study) were collected for comprehensive analysis. The response rate was 89.3%, facilitated through email and social media."

Data Analysis: In the study, SPSS 26 was utilized for data analysis. Descriptive statistics summarized the data, including frequency, percentage, mean, and standard deviation measures. Additionally, inferential statistics were applied to test hypotheses and research questions. Specifically, a one-sample t-test compared students' attitudes toward research with the theoretical mean of 3. The value of 3 is commonly used as a neutral midpoint in Likert scale surveys, where responses typically range from 1 (strongly disagree) to 5 (strongly agree). This midpoint represents a neutral attitude, allowing respondents to express neither agreement nor disagreement with the statement. Furthermore, a MANOVA (Multivariate Analysis of Variance) examined the impact of gender, academic semester, and field of study on students' attitudes toward research and Obstacles to conducting research by students.

Results

The study assessed the attitudes and barriers to research among 682 students at TUOMS. The sample included 269 male (39.44%) and 413 female (60.56%) students. Among the fields of study, paramedical disciplines had the highest representation (42.81%), followed by medicine (26.39%), pharmacy (21.99%), and dentistry (8.79%). In terms of academic semesters, the largest group of students was in their 8th semester (24.19%), closely followed by those in their 6th semester (22.43%) and 4th semester (21.84%). Students aged 24 years old were most common (19.35%), with 23-year-olds (16.71%) and 22-year-olds (12.31%) following suit. Older students beyond age 27 were less prevalent in the sample.

To determine the attitude of TUOMS students towards research, a one-sample t-test was used to compare the mean score of the students with the theoretical mean of 3, which indicated a neutral attitude.

The results in Table 2 showed that the mean score of the students was significantly higher than the theoretical mean ($P < 0.001$). Means were used to rank the items related to the research attitude component. Results showed a significant difference in the mean of the 10 items about attitude toward research**.** The item with the highest mean rank was "We're living healthier and safer with science" ($M = 3.93$), and the item with the lowest mean rank was "Research is important because it develops logical thinking and the ability to deduce" ($M = 2.57$).

A one-sample t-test compared the mean ratings of each obstacle with the theoretical mean of 3. The results are in Table 3.

The students considered most of the obstacles (9 out of 13) as important barriers to research, as their mean ratings were higher than 3 ($p < 0.05$).

The results showed that the mean score of the students was significantly higher than the theoretical mean ($p < 0.001$). Means were used to rank the items related to the Obstacles to conducting the research component. The results are also shown in Table 3. There was a significant variation in the means of the obstacles, implying that the students had diverse preferences for the obstacles.

Table 2. Attitude to Research Items Ranked by Mean Scores Using One-Sample T-Test

Items	Mean (SD)	T	p-value	Rank
1- Science allows us to better understand the world	3.67(1.115)	15.656	< 0.001*	5
2- Every doctor, dentist, pharmacist should know the basis of scientific research	3.65(1.059)	16.023	< 0.001*	7
3- We're living healthier and safer with science	3.93(0.955)	25.431	< 0.001*	1
4- I trust the results of research presented by the public (TV, press)	3.54(1.104)	12.663	< 0.001*	8
5- I trust the research results presented in the scientific journal	3.83(0.949)	22.926	< 0.001*	2
6- Every student should take part in scientific research during their studies	3.30(1.326)	5.892	< 0.001*	9
7- A medical student should be able to plan and conduct a research project and write a scientific publication	3.66(1.250)	13.759	< 0.001*	6
8- Conducting research is important to be a good specialist (clinician) in a given medical field	3.80(1.259)	16.541	< 0.001*	3
9- The methodology of conducting scientific research should be taught at university.	3.78(1.281)	15.819	< 0.001*	4
10- Research is important because it develops logical thinking and the ability to deduce	2.57(1.390)	-8.019	< 0.001*	10
Attitude towards research	3.57(0.44)	33.461	< 0.001*	

*The mean obtained is significantly greater than the theoretical mean and the difference is significant

According to the students, the most important obstacle was lack of information on scientific work opportunities, followed by lack of funding/grants for research and lack of experience. The least important obstacle was the discouragement of assistants/teachers/colleagues.

Table 3. Obstacles to Conducting Research Items Ranked by Mean Scores Using One-sample T-Test

Items	Mean(SD)	T	p-value	Rank
11- Lack of time	3.28(1.368)	5.429	< 0.001*	9
12- Lack of funding/grants for research	3.74(1.332)	14.576	< 0.001*	2
13- Lack of knowledge of how to start	3.32(1.517)	5.504	< 0.001*	8
14- Lack of information on scientific work opportunities	3.77(1.346)	14.993	< 0.001*	1
15- Lack/ insufficient financial compensation	3.64(1.301)	12.829	< 0.001*	5
16- No idea/research team	3.63(1.375)	11.978	< 0.001*	6
17- More interest in clinical than scientific work	3.47(1.413)	8.618	< 0.001*	7
18- Lack of experience	3.67(1.389)	12.594	< 0.001*	3
19- Lack of knowledge on the subject	3.65(1.363)	12.416	< 0.001*	4
20- Discouragement of assistants/teachers/colleagues	2.22(1.448)	-14.044	< 0.001*	13
21- Lack of substantive preparation in terms of research during the studies	2.34(1.402)	-12.288	< 0.001*	12
22- Greater emphasis on education than science/research	2.51(1.343)	-9.494	< 0.001*	10
23- Fear of making mistakes	2.44(1.328)	-10.931	< 0.001*	11
Obstacles to conducting research	3.2071(0.554)	9.748	< 0.001*	

*The mean obtained is significantly greater than the theoretical mean and the difference is significant

Table 4 presents the results of a Multivariate Analysis of Variance (MANOVA), which also applied to compare the average attitudes toward research and examine the impact of gender, academic semester, and field of study on students' attitudes toward research. The analysis utilizes Wilks' Lambda to determine the significance of each factor.

Multivariate analysis revealed no significant effect of gender on attitudes toward research or perceived obstacles ($p = 0.848$). Similarly, the semester did not significantly affect these outcomes ($p = 0.731$). However, field of study had a significant multivariate effect ($p<0.05$).

MANOVA tests in Table 5 indicated that the field of study significantly predicted attitudes toward research ($F(3, 630) = 5.847$, $p = 0.001$) and perceived obstacles ($F(3, 630) = 25.553$, $p < 0.05$).

These results suggest that while gender and semester do not appear to influence students' attitudes toward research or their perception of obstacles, the field of study significantly predicts these outcomes.

Table 6 summarizes the Least Significant Difference (LSD) post-hoc test results for the dependent variables 'Attitude toward Research' and 'Obstacle' across different fields of study.

For attitudes toward research, significant mean differences were found between Field of Study Paramedicine and all other fields (Medicine, Dental, and Pharmacoloy), with Field of Study Paramedicine having lower attitudes toward research. No other significant differences were observed between the fields.

Table 4. Multivariate Analysis of Research Attitudes by Gender, Academic Semester, and Field of Study

Effect		Wilks' Lambda	F	p-value
Gender	Male	0.999	0.165	0.848
	Female			
Semester	4	0.984	0.744	0.731
	6			
	8			
	10			
	12			
	14			
	16			
	18			
Field of Study	Medicine	0.880	13.808	< 0.001
	Dental			
	Paramedicine			
	Pharmacology			

For perceived obstacles, significant mean differences were found between the Field of Study Medicine and Paramedicine, the Field of Study Dental and Paramedicine, and the Field of Study Pharmacology and Paramedicine. Paramedicine had more obstacles compared to Medicine, Dental, and Pharmacology.

Table 5. Tests of Between-Subjects Effects Research Attitudes by Gender, Academic Semester, and Field of Study

Source	Dependent Variable	F	p-value
Gender	Attitude toward Research	0.182	0.670
	Obstacle	0.103	0.748
Semester	Attitude toward Research	0.799	0.588
	Obstacle	0.794	0.592
Field of Study	Attitude toward Research	5.847	0.001
	Obstacle	25.553	<0.001

Discussion

The present study aimed to explore students' attitudes at Tabriz University of Medical Sciences (TUOMS) toward research and the barriers they encounter. The findings revealed a positive overall view of research among these students, yet their active participation remained limited. Notably, no significant statistical differences were observed in research attitudes or perceived barriers based on gender or stage of study. However, significant variations emerged in research interest and perceived obstacles across different academic disciplines.

Comparing our results with prior studies, a consistent theme emerges: students generally hold favorable or average attitudes toward research, but practical challenges hinder their active involvement. For instance, Asadollahi et al. (25) and Babamohammadi et al. (26) reported positive research attitudes, emphasizing active engagement in research activities. Similarly, Razavinia et al. (27) found that most Qom medical students exhibited a moderate research attitude unaffected by gender or research experience. Our study aligns with these findings, as gender and stage of study did not significantly impact research attitudes or barriers. In contrast, Camacho Torres et al. (29) and Estrada et al. (32) observed a negative or neutral attitude toward research, diverging from the generally positive outlook in our study. However, the lack of active research participation among TUOMS students mirrors the low engagement reported by El Achi et al. (31) at the American University of Beirut, despite a positive attitude.

The barriers identified in our study resonate with broader literature. Kyaw et al. (39) highlighted time constraints, knowledge gaps, budget limitations, inadequate facilities, and insufficient rewards as primary obstacles-consistent with the challenges faced by TUOMS students. Furthermore, Moradabadi et al. (34) and Memarpour et al. (35) emphasized the lack of research skills and resources and distrust in domestic research outcomes as significant hindrances, corroborating our findings.

Our research underscores the need for enhanced educational support and resources to foster a positive research attitude and promote active participation. Addressing these barriers could lead to more profound student involvement and potentially elevate the quality and quantity of research output.

Table 6. Multiple Comparisons of Attitude toward Research and Obstacles across Different Fields of Study

Dependent Variable	(I) Field of Study	(J) Field of Study	Mean Difference (I-J)	Std. Error	p-value
Attitude toward Research	Medicine	Dental	0.0183	0.06521	0.779
		Pharmacology	-0.0710	0.04836	0.143
		Paramedicine	-0.2250	0.04146	<0.001
	Dental	Pharmacology	-0.0893	0.06682	0.182
		Paramedicine	-0.2433	0.06201	<0.001
	Pharmacology	Paramedicine	-0.1540	0.04395	<0.001
Obstacle	Medicine	Dental	-0.0218	0.07619	0.775
		Pharmacology	-0.1244	0.05651	.028
		Paramedicine	-0.4782	0.04844	<0.001
	Dental	Pharmacology	-0.1026	0.07808	.189
		Paramedicine	-0.4564	0.07245	<0.001
	Pharmacology	Paramedicine	-0.3538	0.05135	<0.001

Conclusion

This study concludes that students at the Tabriz University of Medical Sciences (TUOMS) have a positive attitude toward research and recognize its importance in their education and future professions. However, they face numerous challenges and barriers that hinder their active participation in research. These barriers include a lack of information about scientific opportunities and insufficient funding. The study recommends strategies to improve research education and cultivate a research-oriented culture among students, based on their opinions and needs. It also identifies limitations and suggests directions for further research on this topic. This study contributes to the literature on the attitudes and behaviors of medical students towards research and provides insights for enhancing research capacity and quality in medicine.

This study's limitation include using a questionnaire, which may have caused bias and error. Future research can use other methods, such as interviews, focus groups, observations, and experiments, to better understand students' attitudes. Future research can also compare the attitudes of students from different disciplines, levels, and institutions. The findings have several implications for improving research education and culture among TUOMS students. They are 1) Encouraging and supporting the students' positive attitude by giving them more chances and support to do research; 2) Improving the students' research skills and knowledge by holding workshops, providing resources, assigning mentors, and giving feedback; 3) Overcoming the students' research challenges and barriers by securing funding, improving facilities, allocating time, offering guidance, and creating incentives; and 4) Satisfying the students' research interests and expectations by customizing the research topics, methods, and outcomes to their needs and preferences, and ensuring the research quality and trustworthiness.

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Conflict of interests: There is no conflict of interest.

Ethical approval: The University of Tabriz's ethical principles and guidelines were followed. The ethics committee approved the study with the code of IR.TABRIZU.REC.1402.123, and the participants consented before the data collection. The participants were informed about the study's purpose and significance, and their voluntary and anonymous participation. They could withdraw at any time without consequences. The data were secure and confidential, and only the researcher accessed them. The data were only for this study, and the findings were reported honestly and accurately.

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