https://doi.org/10.29309/TPMJ/2026.33.02.9844 www.theprofesional.com

ORIGINAL ARTICLE

Obstacles and challenges encountered by undergraduate medical and dental students in pursuing research in a public sector university.

Hina Shah[1], Mohsin Rizvi[2], Marium Irshad[3], Dua Ayoub[4], Ifra Urooj[5], Karina Lakhani[6]

ABSTRACT… Objective: To identify the common challenges obstructing undergraduate medical and dental students in pursuing research at Jinnah Sindh Medical University (JSMU), Karachi. **Study Design:** Cross-sectional survey. **Setting:** Jinnah Sindh Medical University. **Period:** October to December 2024. **Methods:** Study was conducted among 322 undergraduate medical and dental students from Sindh Medical College (SMC) and Sindh Institute of Oral Health Sciences (SIOHS). Data were collected through a structured questionnaire after informed consent. Descriptive statistics and chi-square tests were performed using SPSS v26. **Results:** Of the 322 participants, 64.9% were females and 27% had a GPA of 4.0. While most students (83.5%) expressed interest in research and 95.3% acknowledged its importance, only 55.6% had ever participated in a project, and just 15.8% had published their work. The most frequently reported barriers were lack of research skills (65.2%) and difficulty in selecting a topic (52.8%). No significant associations were observed between demographic variables and reported barriers. **Conclusion:** Despite positive attitudes toward research, undergraduate medical and dental students at JSMU face substantial challenges, particularly inadequate research skills and difficulties in topic selection. Universities should strengthen structured mentorship programs, provide research training workshops, and allocate institutional funding to foster a sustainable research culture in undergraduate education.

Key words: Dental, Goals, Medical, Mentoring, Motivation, Research Design, Students.

Article Citation: Shah H, Rizvi M, Irshad M, Ayoub D, Urooj I, Lakhani K. Obstacles and challenges encountered by undergraduate medical and dental students in pursuing research in a public sector university. Professional Med J 2026; 33(02):280-286. https://doi.org/10.29309/TPMJ/2026.33.02.9844

INTRODUCTION

Scientific research is a systematic study characterized by its approach to problem-solving such as evaluating the issue and is the catalyst in a community for its development and gauge of its growth.[1,2] There is a growing focus on scientific research across both under developed and developed nations as research in biomedical field can improve the outcome of care provided.[2] The importance of research is highlighted by the fact that the world's top seven science-producing nations are also the leading countries in terms of research facilities, whereas underdeveloped nations lag behind due to limited research opportunities and infrastructure.[3] According to a survey of 2007, established high income countries had 3655.8 researchers per meg individuals while just 580.3 in under developing countries.[4]

Research plays a vital role in the health care services by contributing in terms of advancement of medical equipment and development of new medicines and diagnostic tests. Previously published data supports the importance of conducting research during undergraduate medical education in securing a position in highly competitive residency programs.[5,6] Furthermore, studies have also shown that exposure to research and related activities early in their academics encourages them to choose academics as career.[7]

The initial step toward organizing research activities is gaining an accurate understanding of the available capabilities and facilities, as well as assessing the strengths and weaknesses of research plans. Recognizing shortcomings and identification of awareness of the quality and degree of achievement of research goals are among essential tools for research decision-makers. A significant indicators of the growth and development of the societies is the technological prowess and scientific research capacity, both of which may encounter

1. MDS, BDS, Associate Professor Community Dentistry, Sindh Institute of Oral Health Sciences, Jinnah Sindh Medical University, Karachi.
2. BDS, Lecturer Oral Pathology, Sindh Institute of Oral Health Sciences, Jinnah Sindh Medical University, Karachi.
3. BDS, Sindh Institute of Oral Health Sciences, Jinnah Sindh Medical University, Karachi.
4. BDS, House Officer, Sindh Institute of Oral Health Sciences, Jinnah Sindh Medical University, Karachi.
5. BDS, House Officer, Sindh Institute of Oral Health Sciences, Jinnah Sindh Medical University, Karachi.
6. BDS, House Officer, Sindh Institute of Oral Health Sciences, Jinnah Sindh Medical University, Karachi.
Correspondence Address:
Dr. Hina Shah
Department of Community Dentistry, Sindh Institute of Oral Health Sciences, Jinnah Sindh Medical University, Karachi.
hina.shah@jsmu.edu.pk,

Article received on:
16/05/2025
Date of revision:
18/09/2025
Accepted for publication:
22/09/2025

obstacles originating from economic, social, and cultural factors, which could potentially impede the progress.[8] Largely, most of the obstacles in pursuing medical researches experienced by students are known, that creates a demand for further study.[9] To resolve this shortcoming, it is essential to foster some characteristics during their academic journey including learner driven learning, problem solving skills, critical thinking, adapting the teaching approach to prioritize treatment planning and integrating research into the curriculum is of particular importance.[10,11]

Most of the medical students judged research as nerve-racking and complicated, they have just a little bit knowledge about any kind of medical research and very low-priority of practice according to a lot of reported studies.[12,13] In medical colleges, undergraduate participation in research is hindered by the inadequate assistance and guidance from the medical and dental school, economic challenges, intense workload, technique problems, disinterest and lack of knowledge, vast curriculum, lack of time and limited exposure to research methodology.[2,14-16] These challenges appear to be more prominent in developing nations.[15] When these students get into their post-graduation, their proficiency in writing protocols or proposals may not meet expectations.[2] In addition, not all students are native English speakers, so they face many problems in the process writing article.[17]

As universities constitute the primary scientific backbone of societies, it is the duty of the universities to undertake a significant portion of research endeavors. The responsibility within universities falls on both students and faculty members. Unfortunately, research findings indicate that many faculty members in developing countries allocate most of their time to educational activities. Hence the dearth of time for research activities.[1]

The majority of students expressed positive perception regarding three items; medical research's promotion of critical thinking, its potential to enhance career prospects, and enhancing knowledge. Additionally, as students' GPA increased, their perception of medical research improved. Among the identified barriers to participation by students from health sciences, "lack of allotted time for research" emerged as the most predominant barrier (80.3%) followed by "limited exposure and opportunities" (79.9%), "a lack of training and support" (78.3%), and a "lack of mentoring and guidance" (76.6%) according to research conducted in American University of Beirut.[18]

As the students have an important part in the development of a nation through their research and by conducting the medical research so it is necessary for medical students to know everything about the medical research so they can achieve the goal in their field as they will be the future's star.[17,18] Medical and dental students play an essential role in the advancement of healthcare through research. Despite this importance, there exists a notable gap regarding the obstacles and challenges that prevent them from actively participating in medical research. This study will help identify the knowledge gap that exists in the local context in the literature about the potential obstacles and challenges in pursuing medical research.

METHODS

A Cross-sectional study was completed at Jinnah Sindh Medical University (JSMU), Sindh Medical College (SMC) and Sindh Institute of Oral Health Sciences (SIOHS) Karachi, Pakistan from October 2024 to December 2024 after the approval of IRB of Jinnah Sindh Medical University (JSMU/IRB/2024/893 approved on 4th September 2024) and was conducted in accordance with the Declaration of Helsinki. The sample size was calculated by taking total number of undergraduate medical and dental student at JSMU (SMC and SIOHS) 1950 and maintaining a margin of error of 5% and a confidence level of 95%, a sample size of 322 is calculated using the reputable online calculator Open Epi.[19] Inclusion criteria was all undergraduate medical (1st, 2nd, 3rd, 4th and 5th year) and dental students (1st, 2nd, 3rand 4th year) of JSMU (SMC and SIOHS), regardless of whether they have previous experience in pursuing research from both genders were included. The teaching and non-teaching medical and dental faculty, non-consenting participants and house officers, residents and interns were excluded. Non-probability convenience sampling technique was utilized for data collection.

Data was using a modified self-administered, structured questionnaire. The questionnaire consisted of closed-ended questions divided into three sections. The first section of the questionnaire comprised of demographic information like age, sex, academic year, discipline (medical or dental) and GPA etc. The second section of the questionnaire comprised of attitude of students towards pursuing research. The last part will consist of obstacles and challenges in pursuing medical research experienced by undergraduate students. Likert scale was used for the second and third sections of the questionnaire. Further, the questionnaire pilot tested on 10 participants yielding good face validity and 0.7 Crohn Bach`s Alpha was also good.

The questionnaire was distributed among the students of JSMU (SMC and SIOHS) after obtaining consent from them. Researchers distributed a hard copy of questionnaire among participants before a lecture in which they were informed about the aims and objectives of the study and how to fill the questionnaire after signing the consent. Data was entered and analyzed using SPSS v26.0 (IBM Corp, Armonk, NY, USA). and incomplete forms were removed as part of protocol. Personal information was coded, and raw data remained with the principal investigator.

RESULTS

The descriptive analysis of the participants (n = 322) provides insights into their demographic and academic characteristics. The age distribution shows that most participants were between 20 to 22 years old, with 22.7% (n = 73) being 21 years old, followed by 22.0% (n = 71) aged 20 years. The age range extended from 18 to 25 years, with only 0.9% (n = 3) of participants being 25 years old. In terms of gender, most participants were females, accounting for 64.9% (n = 209), while males made up 35.1% (n = 113). Regarding the academic institute, the majority (84.5%, n = 272) were from SMC, with only 15.5% (n = 50) from SIOHS.

The academic year distribution was relatively balanced, with the highest proportion of participants in the 4th year (21.4%, n = 69) and the lowest in the 5th year (16.8%, n = 54). For GPA/cGPA, a significant proportion of participants (27%, n = 87) had a GPA of 4.0. Other notable GPA ranges included 3.50, held by 7.5% (n = 24), and 3.70, reported by 6.5% (n = 21). The participants with GPAs between 2.0-2.9 were minimal, making up only 0.3% (n = 1). Overall, most of the sample exhibited strong academic performance. The final data was checked for normalcy before applying statistical tests, and it showed deviation from the "normal".

In Table-I summarizes students' attitudes toward research based on their responses. Chi-square test was used; $p<0.05$ was considered statistically significant. Data were analyzed using SPSS v26.0 (IBM Corp, Armonk, NY, USA).Overall, students showed strong interest in and recognition of research's importance, but participation and success in research activities are lower, indicating a need for more support and opportunities.

Table-II The data presents student experiences regarding research across two institutes (SIOHS and SMC) with a total of 322 responses. Chi-square test was used; $p<0.05$ was considered statistically significant. The responses Strongly agreed and agreed are summarized as "agree" and strongly disagree and disagree as "disagree" to simplify the data. The Pearson chi-square value was non-significant for all the items. Only 2 items showed more than 50% responses of the participants from both colleges having 2 similar problems that is lacking in research skill (SIOHS=38, SMC=171) and selecting topic for research (SIOHS=30, SMC=140).

DISCUSSION

The current study provides valuable insights into the demographic and academic characteristics of medical and dental students and their attitudes toward research. The descriptive analysis reveals that most of the participants were between 20 and 22 years old, with a significant proportion being female (64.9%). Additionally, the academic performance of the sample was generally strong, with a notable number of students achieving a GPA of 4.0. However, despite their academic success, the findings show that students face several barriers when it comes to research participation.

TABLE-I

Attitudes of students regarding Research

S No.	Item	Response	
		Yes	No
1	Do you have an interest in doing research?	269	53
2	Do you think undergraduate students should take part in research?	286	36
3	Do you believe in the importance of medical research?	307	15
4	Have you ever attended a research session?	188	134
5	Have you ever participated in any research?	179	143
6	Did you publish it?	51	271
7	Did you get awarded for your research?	11	311
8	Do you have a plan to continue research after graduation?	258	64

TABLE-II

Responses of Student's regarding their Experience from Both Institutes.

Item	Response N=322	SIOHS	SMC	Pearson-Chi Square
I lack interest in pursuing research	Agree Disagree	16(4.96%) 21(6.52%)	73(22.6%) 86(26.7%)	.613
I lack opportunities to conduct research	Agree Disagree	20(6.2%) 16(4.96%)	109(33.8%) 105(32.6%)	.263
I lack knowledge/skill in conducting research	Agree Disagree	38(11.8%) 0(0%)	171(53.1%) 0(0%)	0.627
I have lack of time due to overburden of studies	Agree Disagree	20(6.2%) 11(3.4%)	86(26.7%) 120(37.3%)	0.151
I am bit short of finance	Agree Disagree	20(6.2%) 13(4%)	154(47.8%) 47(14.6%)	.114
I have lack of mentoring	Agree Disagree	20(6.2%) 13(4%)	154(47.8%) 47(14.6%)	0.298
I find it difficult to choose topic	Agree Disagree	30(9.3%) 9(2.79%)	140(43.5%) 57(17.7%)	0.343
I find it difficult to write a proposal	Agree Disagree	23(7.14%) 11(3.4%)	107(%) 92(28.6%)	0.381
I find it difficult to get ethical permission	Agree Disagree	14(4.34%) 20(6.2%)	81(25.1%) 99(30.7%)	0.500
I find it difficult to collect data	Agree Disagree	17(5.3%) 18(5.6%)	116(36%) 94(29%)	0.685
I find it difficult to analyze data	Agree Disagree	23(7.1%) 10(3.1%)	101(31.4%) 87(27%)	0.424
There is inaccessibility to relevant medical & other electronic databases	Agree Disagree	20(6.2%) 18(5.59%)	115(35.7%) 85(26.4%)	0.779
There is inefficient faculty staff to deliver necessary knowledge & skills in the institute	Agree Disagree	19(5.9%) 20(6.2%)	187(58%) 59(18.3%)	0.065
I am awarded for my work	Agree Disagree	4(1.24%) 31(9.6%)	26(8.1%) 140(32.3%)	0.641

*Value significant up to the level of 0.05, "Value significant up to the level of 0.001.

One of the most prominent barriers identified in this study is a "lack of research skills", which was reported by a majority of participants (SIOHS=38, SMC=171). This finding aligns with previous studies, such as Chellaiyan et al. and Soe et al.(72.1% of Malaysian students) , where inadequate knowledge and skills were highlighted as significant obstacles.[4,5] Similarly, Dadipoor et al. in 2019 reported that students in Iran also struggled with insufficient research skills, suggesting this is a widespread issue that transcends regional boundaries.[1]

Another key issue identified in both studies is the "challenge of time management".[4,5] In our study, students cited academic responsibilities as a major obstacle to engaging in research, consistent with the findings of Dadipoor et al., Soe et al., and Ibrahim et al.[1,4,7] Time constraints are consistently reported as a significant barrier across multiple regions, from Egypt to Malaysia. This highlights the need for better time management training and institutional support to enable students to balance their academic workloads with research activities.

The "lack of mentorship" also emerged as a crucial barrier in this study. Students from both SIOHS and SMC indicated that insufficient guidance from experienced researchers hindered their ability to participate in research. This is consistent with findings from El Achi et al., who reported that the absence of proper mentoring significantly limited students' research engagement.[10] Similar findings were observed in studies conducted by Turk et al.and Alhabib et al., suggesting that mentorship is a critical factor in enabling students to succeed in research.[3,8]

In addition to skill-related and mentorship barriers, "organizational constraints" were reported by the participants. Students indicated that difficulties in accessing research resources, such as databases and institutional support, were major obstacles. This issue is not unique to this study, as Assar et al. and Safdari et al. also identified organizational barriers as significant challenges for students and faculty alike.[2,6] Addressing these infrastructural issues is essential for promoting student involvement in research across institutions.

While most students acknowledged the importance of research, the study revealed a "lack of enthusiasm" among some participants, with a portion expressing disinterest in pursuing research. This finding is in line with Alhabib et al., where 14.7% of students were not involved in research due to lack of interest.[8] However, the literature also suggests that fostering a positive attitude towards research, as seen in the studies by Turk et al. and El Achi et al., can significantly enhance student participation.[3,10]

Finally, "incentives and motivators" such as career prospects and academic benefits were identified as key drivers for research participation in both this and previous studies. Alhabib et al. found that career advancement, particularly residency admission, was a strong motivator for students to engage in research, which was also supported by the current study's findings. The findings illustrate the importance of trained faculty with designated time for conducting research and funds allocation by the institute to support the researchers. Adding them as weighted part of the curriculum is another strategy that was recently done by Pakistan Medical and Dental Council, research is added as longitudinal theme in both medical and dental curriculum which is assessed by theory paper and publication of the research.[20] Since, importance of research in recent years have remarkably increased in all fields of life sciences hence, more efforts should be made to support students to have the relevant knowledge and skills.

CONCLUSION

This study identified the common challenges that obstruct undergraduate medical and dental students at JSMU from pursuing research. While students recognize the importance of research and express strong interest in engaging with it, their participation is hindered by limited skills, inadequate mentorship, and difficulties in selecting suitable topics. These barriers are consistent with global trends, indicating that challenges in undergraduate research are not unique to Pakistan. Addressing these obstacles requires universities to integrate structured research training into the curriculum, establish dedicated mentorship systems, and ensure access to resources and funding. Such institutional support

is essential for fostering a research-oriented culture and preparing future healthcare professionals to actively contribute to evidence-based practice and academic scholarship.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

SOURCE OF FUNDING

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

REFERENCES

1. Dadipoor S, Ramezankhani A, Aghamolaei T, Safari-Moradabadi A. **Barriers to research activities as perceived by medical university students: A cross-sectional study.** Avicenna Journal of Medicine. 2019; 9(01):8-14.
2. Pallamparthy S, Basavareddy A. **Knowledge, attitude, practice, and barriers toward research among medical students: A cross-sectional questionnaire-based survey.** Perspectives in clinical research. 2019; 10(2):73-8.
3. Asl NS, Ghorbani R, li Rashidy-Pour A. **Viewpoints of faculty members of Semnan University of Medical Sciences about research barriers.** Koomesh. 2014; 16(1):1-7.
4. Soe HHK, Than NN, Lwin H, Htay MNNN, Phyu KL, Abas AL. **Knowledge, attitudes, and barriers toward research: The perspectives of undergraduate medical and dental students.** Journal of Education and Health Promotion. 2018; 7(1):23.
5. Alhabib RK, Alhusseini N, Aboalsamh AG, Adi G, Ismail A, Hajja A, et al. **Motivators and barriers to research participation among medical students in Saudi Arabia.** Plos one. 2023; 18(4):e0284990.
6. Noorelahi MM, Soubhanneyaz AA, Kasim KA. **Perceptions, barriers, and practices of medical research among students at Taibah College of Medicine, Madinah, Saudi Arabia.** Advances in Medical Education and Practice. 2015; 479-85.
7. Ibrahim Abushouk A, Nazmy Hatata A, Mahmoud Omran I, Mahmoud Youniss M, Fayez Elmansy K, Gad Meawad A. **Attitudes and perceived barriers among medical students towards clinical research: A cross-sectional study in an Egyptian Medical School.** Journal of Biomedical Education. 2016; 2016(1):5490575.
8. Safdari R, Ehtesham H, Robiaty M, Ziaee N. **Barriers to participation in medical research from the perspective of researchers.** Journal of Education and Health Promotion. 2018; 7(1):22.
9. Alsulami AF, Khaimi ZO, Hadi MA, Aljabri YH, Mayet TS, Althubaiti A. **"Publish or Perish": barriers to research publication in an undergraduate medical research program.** BMC Research Notes. 2023; 16(1):269.
10. Khan SQ, Farooqi FA, Moheet IA, Rejaie AS. **Attitude and experiences of undergraduate dental students and interns towards research.** Saudi Journal of Medicine & Medical Sciences. 2016; 4(2):108-11.
11. Sharma N, Pramila M, Krishnamurthy A, Umashankar G, Ahuja N. **Knowledge, attitude, and practices in research among postgraduate students in dental institutions in Bengaluru City, India.** Journal of Indian Association of Public Health Dentistry. 2014; 12(3):189-93.
12. Al-Shalawy FA-N, Haleem A. **Knowledge, attitudes and perceived barriers towards scientific research among undergraduate health sciences students in the Central Province of Saudi Arabia.** Education in Medicine Journal. 2015; 7(1):e16-e21.
13. Chellaiyan VG, Manoharan A, Jasmine M, Liaquathali F. **Medical research: Perception and barriers to its practice among medical school students of Chennai.** Journal of Education and Health Promotion. 2019; 8(1):134.
14. Abdulrahman S, Aboalshamat K, Muthana M, Sait G, Bantan N, Hafiz S, et al. **Knowledge, attitude, practice, motives and barriers towards scientific research among dentists and dental students in Saudi Arabia.** The Open Dentistry Journal. 2020; 14(1):615-22.
15. Hakami MS. **Barriers to conducting and publishing scientific research among nursing faculty members in Saudi Arabia.** Journal of Multidisciplinary Healthcare. 2023; 2733-43.
16. Turk T, Al Saadi T, Alkhatib M, Hanafi I, Alahdab F, Firwana B, et al. **Attitudes, barriers, and practices toward research and publication among medical students at the University of Damascus, Syria.** Avicenna Journal of Medicine. 2018; 8(01):24-33.
17. Cohen MD, Jennings SG. **Agreement and reproducibility of subjective methods of measuring faculty time distribution.** Academic Radiology. 2002; 9(10):1201-8.
18. Ommering BW, Wijnen-Meijer M, Dolmans DH, Dekker FW, van Blankenstein FM. **Promoting positive perceptions of and motivation for research among undergraduate medical students to stimulate future research involvement: A grounded theory study.** BMC Medical Education. 2020; 20(1):204.
19. Dean AG. **OpenEpi: open source epidemiologic statistics for public health, version 2.3. 1.** http://www openepi com. 2010.
20. Mehboob B, Mahboob U, Jamil B, Shaheen N. **Needs analysis for an undergraduate dental curriculum in KPK, Pakistan: Gap identification and general needs assessment.** Pakistan Journal of Medical Sciences. 2024; 40(5):967.

AUTHORSHIP AND CONTRIBUTION DECLARATION	
1	**Hina Shah:** Designing of study, data analysis, manuscript writing.
2	**Mohsin Rizvi:** Basic idea, writing.
3	**Marium Irshad:** Manuscript draft.
4	**Dua Ayoub:** Drafting of tables.
5	**Ifra Urooj:** Questionnair.
6	**Karina Lakhani:** Data collection.