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Obstacles Encountered by Medical Students in Conducting Academic Research - A Cross-Sectional Study

Ayesha Bashir[1*], Qasim Raza[2], Danish Hussain[3], Syeda Amna Iqbal[4], Akram Ali[5], Muhammad Azhar[6], Kaiynat Shafique[7] & Iqra Tahir[8]

[1]The Islamia University Bahawalpur [2]Indus Hospital and Health Network Karachi [3]Indus Hospital and Health Network Karachi [4]Indus College of Physical Therapy and Rehabilitation [5]Indus Hospital and Health Network Karachi [6]Ziauddin University Karachi [7]The University of Faisalabad [8]The University of Faisalabad

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Abstract

Purpose: Research is the most important aspect for the betterment and enhancement of medical services that are provided to the community. Health training research is regarded as a critical activity in current medical training at the undergraduate level. The aim of this investigation was to identify the key obstacles that medical students face when performing academic research and to see if these issues differ between female and male students.

Materials and Methods: A cross-sectional research was carried out, encompassing 164 participants, wherein a modified questionnaire was deployed for data acquisition. Employing a simple random sampling methodology, data was gathered exclusively from final year undergraduate medical students from government and private universities of Faisalabad. Exclusions were made for individuals exhibiting isolated personalities, lack of willingness to participate in research, and those presenting psychological concerns. Data was analyzed using SPSS version 22 and presented in form of tables and graphs.

Findings: Participants mean age was 20.73±1.7. Out of 164 students, 60.4% were females and 39.6% were males. Most prominent obstacles were found to be limited monetary support or lack of funding for research, family responsibilities, lack of guidance from university professors, demotivating university authorities, social responsibilities, and lack of knowledge about statistical methods, limited availability of information sources, limited time, insufficient understanding of research procedures, and insufficient research abilities. There were no statistical significant differences found between male and female students regarding these perceived obstacles.

Implications to Theory, Practice and Policy: Institutes need to organize a variety of research-related activities, and teachers must encourage students to participate in research activities. International and local seminars should be organized for students to emphasize the importance of medical research. Teachers should involve students in research projects so that they can expand their knowledge. Because the sample size in this study was small, it must be replicated with a larger sample size in future studies. It is recommended that additional research be conducted to investigate the perspectives of university professors, research mentors, and university authorities in order to gain a comprehensive understanding of the challenges and potential solutions. Collaborate with university administration to identify potential sources of financial support for student research projects.

Keywords: *Barriers, Hindrances, Obstacles, Physical Therapy, Research*

1.0 INTRODUCTION

Research is the most essential part for the betterment and enhancement of health related services that are given to the community (1). Health training research is regarded as an important endeavour in current undergraduate medical education. Participation of medical students in scientific research endeavours allows them to learn research procedures and abilities, which improves patient consideration (2). Thus satisfactory level of logical & analytical thinking, information and optimistic approach are important to carrying out the research. Research conducted at undergraduate level is the best way to increase the knowledge, basic skills and professionalism in students.

One of the most noteworthy features of every academic organization is research. The long term survival of an organization is determined by the way it grooms its future researchers. The ability of a student to communicate and describe the findings of his research is so important that now it is regarded the minimal proficiency for every institute's graduate student (3). There is a huge relevance of research in the field of physiotherapy, which includes verifying the effectiveness of therapy services, providing facts about the effectiveness of therapy, improving the quality of care for patients by making sensible, evidence-based clinical choices, and providing solutions to therapist queries (3).

The advancement in the medical field depends on the quality of researches. When policy makers, health administrators and health care providers integrate the knowledge from health and clinical research into health policies, management and procedures, patient's safety and disease outcomes are likely to be improved (4). The implementation of research results in the medical practice requires that the medical and health care practice decisions should be based on appropriate and applicable research processes. To achieve this result, it is expected that medical researchers should be well trained and educated about the research besides having the mindset that research is worthwhile. Education and practice for research skills and formal research experience in both medical education and early career phases is correlated with the advancements in the quality and efficacy of medical practice. As compared to developed countries, the trend of research and evidence based practice is very low in developing countries and the physicians are no aware of their roles in research projects. The educational programs and seminars should be arranged to create awareness about the significance of research, to provide research trainings and skills and to motivate the physicians to participate in research projects (5-7).

In the study by Basudan and colleagues on dentists at National Guard Health Affairs in Riyadh, the majority exhibited positive attitudes towards research, recognizing its role in knowledge enhancement and career opportunities. However, significant barriers such as inadequate funding, poor documentation, and lack of technical and administrative support were identified as impediments to conducting research (9). The study at Ain Shams University, Egypt, identified major obstacles in clinical research for medical students as insufficient time, lack of proper mentoring, and inadequate funding (7).

Statement of Problem

The study aimed to identify the key obstacles encountered by medical students in conducting academic research and assess whether these challenges vary between male and female students.

Its rationale lies in understanding these barriers to enhance the research culture in the field. The study addresses a significant literature gap by focusing on a student population that is often underrepresented in research discussions. The significance of this study is twofold; it will provide insights into specific hurdles encountered by medical students in Pakistan, potentially informing educational strategies and policy decisions to improve research engagement and output in this vital healthcare sector.

There are geographical variances in students' views of research hurdles. Scholars in impoverished nations confront additional challenges when it comes to research at the undergraduate level as compared to those students who are living in developed countries. Developing countries lack proper infrastructure that is necessary for research conductance. But lack of sufficient time for conducting research is a universal problem of all the undergraduate students. Examination overload causes a dearth of time. One of the primary challenges that undergraduate students face during research activities is an inadequate level of professional supervision. Limited motivation and rewarding is also a major barrier in research. Undergraduate medical students lack interest in research because they don't have sufficient knowledge as well as necessary skills to conduct research projects decisions (7, 8).

2.0 MATERIALS AND METHODS

Study Design and Population

It was a cross-sectional research. Simple random sampling technique was used to gather data from 164 undergraduate medical students from government and private universities of Faisalabad. The sample size was calculated through Open Epitool software. The study specifically focused on undergraduate students, excluding individuals with isolated personalities, unwillingness to participate in research, and psychological issues. Duration of the study was 6 months.

Data Collection Procedure

To gather information related to obstacles faced by medical students, a modified questionnaire was utilized, which underwent revision under the guidance of 2 to 3 experts from the department. The student's opinions were measured using a Likert scale. Before the data collection, all of the subjects were provided with comprehensive information about the study's goal and its importance. In accordance with the defined inclusion and exclusion criteria, study subjects were recruited using a simple random sampling technique. Consent forms were obtained from all participants to ensure their agreement to take part in the study. The data was collected through personal and direct administration of questionnaires, fostering a more engaging and interactive approach to data collection. This method involved in-person interactions with the undergraduate students, enabling a deeper level of engagement, enhanced comprehension, and the opportunity for immediate clarification and feedback.

Statistical Analysis

The collected data was thoroughly analyzed using SPSS version 22 software. Frequency distribution was employed to explore obstacles encountered by the physical therapy students, while the Chi-Square test was utilized to see the significant differences of these perceived obstacles between male and female students.

Ethical Consideration

Ethical issues were scrupulously followed throughout the study, guaranteeing respect for the privacy of all students. A permission letter signed by the Head of department was used to get permission of data collection from the universities. Clear communication regarding the study's procedure, significance, and purpose was provided to all participants. Confidentiality measures were diligently implemented to safeguard personal data, preserving the privacy and anonymity of the individuals involved in the research.

3.0 FINDINGS

Demographic Statistics

Participants mean age was 20.73±1.7 (Table 1). Out of 164 students, 60.4% were females and 39.6% were males (Figure 1). From the total participants of 164, 56.1% were physical therapist, 18.9% were nurses, 8.5% were nutritionist and 16.5% students were from the profession of orthotics and prosthetics (Figure 2).

Table 1: Age of the Participants

Age of the Participants					
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
Age of participants	164	18.00	26.00	20.7317	1.74826

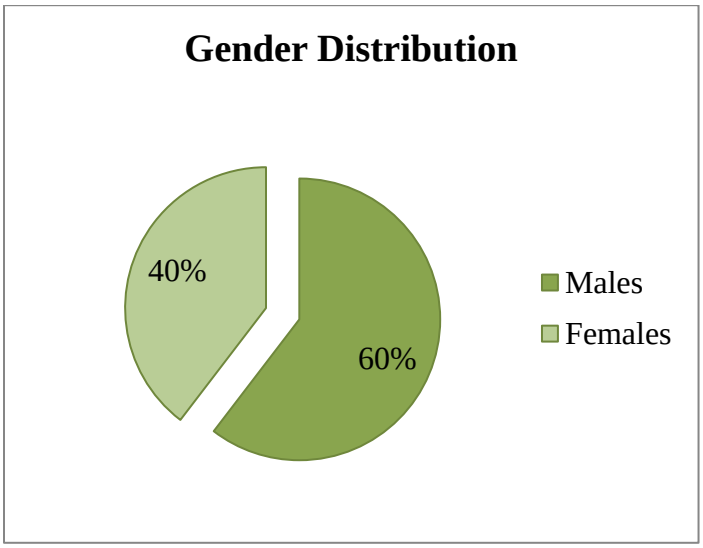

Figure 1: Gender of the Participants

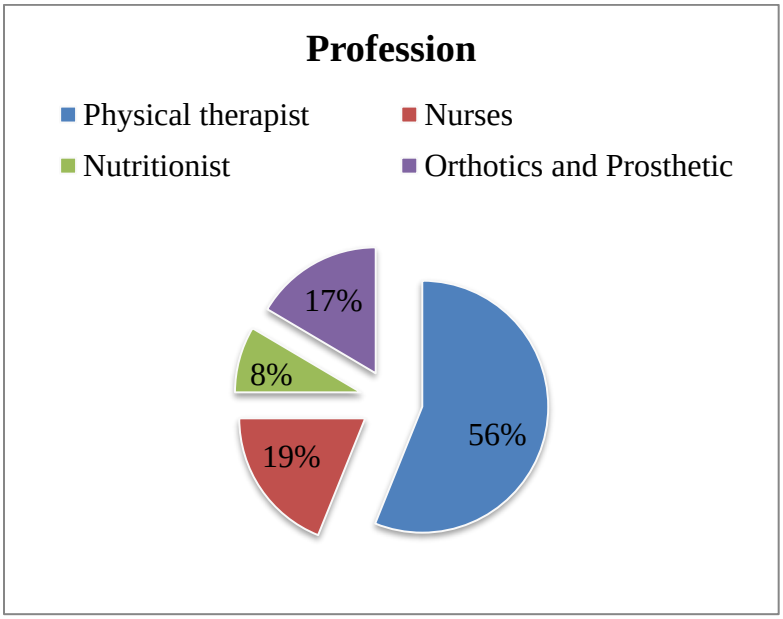

Figure 2: Profession of the Participants

The questions related to obstacles were categorized into two parts and each part has five questions. First five questions were related to personal obstacles and question six to ten was related to organizational barriers. Likert scale was used to measure the response of the participants'. Participants were asked to rate their opinion about each statement on a scale where 'Strongly Disagree' was coded as 1, 'Disagree' as 2, 'Neutral' as 3, 'Agree' as 4, and 'Strongly Agree' as 5. The Mean value represents the average score for each question, providing a summary measure of participants' overall response on each question related to the encountered barrier. Higher mean values indicate higher obstacles encountered, while lower mean values suggest lower perceived obstacles encountered in conducting academic research. The most prominent obstacles were found to be limited monetary support or lack of funding for research, family responsibilities, lack of guidance from university professors, demotivating university authorities, social responsibilities, and lack of knowledge about statistical methods, insufficient access to databases, limited time, insufficient understanding of research methodologies, and insufficient abilities to conduct research (Figure 3).

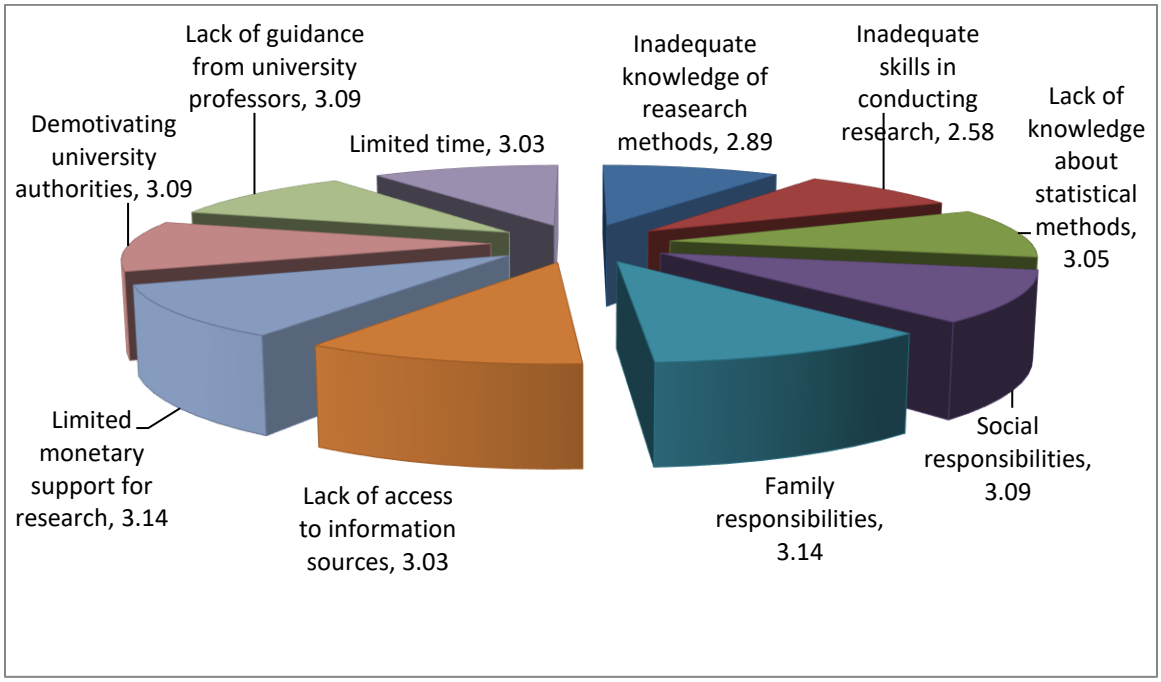

Figure 3: Mean Score of Obstacles Encountered in Conducting Research

The questionnaire related to obstacles encountered by students in conducting academic research had ten questions, each question of 5 scores. The total score was calculated out of 50 and divided into four categories: Low, medium, high and very high. 13.4% reported low barriers, 42.1% students reported to encountered moderate barriers, 36.6% reported to encountered high barriers and 7.9% students reported to encounter very high barriers in conducting academic research (Table 2).

Table 2: Total Score of Obstacles Encountered in Conducting Research

Total Score of Obstacles			
		Frequency	**Percent**
Low	0-15	22	13.4
Moderate	16-30	69	42.1
High	31-45	60	36.6
Very high	45-50	13	7.9
Total	**164**	**100.0**	**100.0**

Table 3 shows the Cross tabulation of gender of participants and total score of obstacles encountered by the medical students in conducting the academic research.

Table 3: Cross Tabulation of Gender of Participants and Total Score of Encountered Obstacles

Gender of Participants * Total score of Obstacles						
		Total score of obstacles				Total
		Low (0-15)	Moderate (16-30)	High (31-45)	Very high (above 45)	
Gender of participants	Males	8	32	21	4	65
	Females	14	37	39	9	99
Total		**22**	**69**	**60**	**13**	**164**

Table 4 shows the results of chi-square tests for gender differences in encountered obstacles in conducting the research. Results show a p value of greater than 0.05. There was no statistical significant difference in obstacles experienced by males and females.

Table 4: Chi-Square Tests for Gender Differences in Obstacles Encountered to Research

Chi-Square Tests			
	Value	Df	Asymptotic Significance (2-Sided)
Pearson Chi-Square	2.375[a]	3	.498
Likelihood Ratio	2.377	3	.498
Linear-by-Linear Association	.726	1	.394
N of Valid Cases	164		

a. 0 cells (0.0%) have expected count less than 5.
b. The minimum expected count is 5.15.

Discussion

Research is the most essential part for the betterment and enhancement of medical services that are given to the community. Health training research is regarded as a critical activity in current medical schooling at the undergraduate level. The current study sought to identify the main obstacles faced by medical students when undertaking academic research and to determine whether these challenges differed across female and male students.

In present research the most prominent obstacles were found to be limited monetary support or lack of funding for research, family responsibilities, lack of guidance from university professors, demotivating university authorities, social responsibilities, and lack of knowledge about statistical methods, insufficient access to databases, a lack of time, insufficient understanding of research procedures, and insufficient expertise in research. The overall barrier score showed that 13.4% participants reported low barriers, 42.1% students reported to encountered moderate barriers, 36.6% reported to encountered high barriers and 7.9% students reported to encounter very high barriers in conducting academic research. The results of chi-square tests for gender differences in encountered obstacles in conducting the research showed a p-value of greater than 0.05. There was no statistical significant difference in obstacles experienced by males and females.

According to Armijo-Olivo and colleagues clinical investigation in physical therapy is critical for producing new information and supporting our interventions. The appraisal of study results is necessary to help in making clinical choices and to adhere to the requirements of a practice based

on evidence (10). Memarpour and colleagues in 2015 reported that there are many factors that affects the performance of the researchers are insufficient knowledge, limited time for conducting research, limited funds for research, difficult access to data, poor interest of researcher and mentor (11). In present study lack of funding for research and family responsibilities are two most prominent obstacles reported by the participants. Other obstacles were insufficient access to databases, a lack of time, insufficient understanding of research procedures, and insufficient expertise in research.

AlGhamdi and colleagues revealed that some major obstacles that medical students' faces during research conductance include limited time, insufficient funding, insufficient supervision, inadequate courses in research training and poor databases accessibility. All of these barriers affect student's interest to pursue research at undergraduate level in the medical institutes. In order to enhance the participation of medical students in research at undergraduate level, students must be motivated and encouraged to take part in research by the faculty. Research methodology must be taught effectively and specific time must be allocated to all the students to participate in research to require a great experience in health care research (12). According to Amin et al. there are regional differences in students' perceptions of barriers towards research. Students in the developing countries have to face more problems towards research at undergraduate level as compared to those students who are living in developed countries. Developing countries lack proper infrastructure that is necessary for research conductance. But lack of sufficient time for conducting research is a universal problem of all the undergraduate students. Examination overload causes a shortage of time. One of the primary challenges that undergraduate students face during research activities is the absence of skilled mentorship. Lack of motivation and rewarding is also a major barrier in research. Undergraduate medical students lack interest in research because they don't have sufficient knowledge as well as necessary skills to conduct research projects (8). These findings were consistent with the findings of the current research.

4.0 CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

Conclusion

In conclusion, most prominent obstacles were found to be limited monetary support or lack of funding for research, family responsibilities, lack of guidance from university professors, demotivating university authorities, social responsibilities, and lack of knowledge about statistical methods, insufficient access to databases, limited time, insufficient understanding of research procedures, and insufficient expertise in research. There were no statistical significant differences found between male and female students regarding these perceived obstacles.

Limitations

- The study focused only on final year undergraduate medical students from Faisalabad, which may not be representative of the entire medical student population.
- The data obtained through a questionnaire relies on self-reporting, which may introduce response bias. Participants might underreport or over report certain challenges based on social desirability or perceived expectations.
- The study has small sample size due to short time duration for study.

Recommendations

- Institutes need to organize a variety of research-related activities, and teachers must encourage students to participate in research activities.
- International and local seminars should be organized for students to emphasize the importance of medical research.
- Teachers should involve students in research projects so that they can expand their knowledge.
- Because the sample size in this study was small, it must be replicated with a larger sample size in future studies.
- It is recommended that additional research be conducted to investigate the perspectives of university professors, research mentors, and university authorities in order to gain a comprehensive understanding of the challenges and potential solutions.
- Collaborate with university administration to identify potential sources of financial support for student research projects.

Conflict of Interest

The authors disclosed no competing interests.

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