Perception and Concerns of Undergraduate Medical Students Toward Research: A Descriptive Cross-Sectional Study

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ABSTRACT

Background: Research engagement is a critical component of medical education, enhancing clinical knowledge, problem-solving skills, and innovation. Despite its importance, undergraduate medical students often face barriers to research participation, including limited time, inadequate mentorship, and insufficient curriculum integration. **Objective:** To evaluate the perceptions, awareness, and barriers faced by undergraduate medical students toward research and to identify actionable strategies to improve their engagement. **Methods:** A descriptive cross-sectional study was conducted among 70 undergraduate students at Bilawal Medical College, Pakistan, between September and November 2022. Data were collected using a structured, validated questionnaire distributed during lecture sessions. Variables included perceptions of research benefits, career aspirations, awareness of funding agencies, and barriers to participation. Data were analyzed using SPSS version 25, with results presented as frequencies, percentages, and associations using chi-square tests. **Results:** The mean age of participants was 22.52 years (SD = 2.95). Most students (67.1%) believed research was beneficial, and 52.9% recognized its role in clinical knowledge. However, only 24.3% viewed research as a future career option, and 15.7% were aware of funding agencies. Major barriers included lack of motivation and knowledge (51.4%) and curriculum integration (21.4%). Significant associations were found between funding awareness and perceived importance of research (χ^2 = 6.43, p = 0.01). **Conclusion:** Medical students value research but face significant barriers, including limited awareness and institutional support. Integrating structured research training and mentorship into the curriculum is essential to foster a research-oriented culture in medical education.

INTRODUCTION

Medical research is a cornerstone of advancing healthcare and improving patient outcomes, driven by systematic strategies, evidence-based methodologies, and the pursuit of innovation. The integration of research into medical education is pivotal in cultivating a generation of healthcare professionals equipped to address the evolving challenges of clinical practice and public health. Undergraduate medical students represent a vital group for fostering early engagement with research, as this exposure builds foundational competencies and nurtures an evidence-driven approach to medicine. Research participation at this formative stage contributes to critical thinking, problem-solving skills, and a deeper understanding of medical science, all of which are essential for their professional development and future contributions to healthcare systems (1, 2).

Despite its importance, undergraduate involvement in research often faces significant barriers, including lack of time, inadequate mentorship, limited research opportunities, and insufficient knowledge about funding and career prospects. Studies conducted internationally have highlighted these challenges, underscoring the need for institutional support to mitigate them (3, 4). Addressing these barriers not only enhances the learning experience of students but also fosters a research-oriented culture within medical education. Furthermore, the inclusion of structured research training in undergraduate curricula is instrumental in bridging gaps in knowledge and motivation, enabling students to see research not merely as an academic requirement but as an integral component of clinical excellence and innovation (5, 6).

The perception of research among medical students varies widely, influenced by factors such as the institutional environment, available resources, and awareness of the broader implications of research in clinical practice. A supportive research culture, combined with accessible opportunities and experienced mentorship, has been shown to significantly increase student interest and participation (7). However, research is often perceived as demanding and time-consuming, leading to disinterest among students who prioritize clinical practice due to perceived financial stability and career security (8). This disparity highlights the critical need for interventions that can reshape perceptions and align them with the long-term benefits of research engagement, including career development and contributions to medical science (9).

In the context of medical education in Pakistan, the challenges faced by undergraduate students in engaging with research are compounded by systemic issues such as limited institutional resources and an emphasis on clinical over academic pursuits. By understanding the perceptions and concerns of undergraduate medical students, educational institutions can develop targeted strategies to enhance research engagement. This study explores the perspectives of undergraduate medical students at Bilawal Medical College, aiming to identify their awareness, perceived benefits, and barriers related to research. The findings will inform recommendations for integrating research training into medical curricula, fostering motivation, and creating a conducive environment for research. Ultimately, these efforts are essential for developing a future generation of medical researchers capable of driving innovation and advancing healthcare systems locally and globally (10, 11).

MATERIAL AND METHODS

This descriptive cross-sectional study was conducted among undergraduate medical students enrolled in the first, second, and third years at Bilawal Medical College, Liaquat University of Medical and Health Sciences, Pakistan. The study period spanned from September 2022 to November 2022. The sample size was determined to include 70 participants, selected through convenience sampling, ensuring adequate representation of the target population. Participation was voluntary, and informed consent was obtained from all participants prior to their inclusion in the study. Ethical approval was secured from the relevant institutional review committee, ensuring adherence to the principles outlined in the Declaration of Helsinki (NO. LUMHS/REC/-215 Dated: 19-11-2021).

Data were collected using a structured questionnaire, designed based on a comprehensive review of the literature and validated through a pilot study conducted on a subset of students excluded from the final analysis. The questionnaire was distributed in person at the conclusion of lecture sessions to ensure accessibility and a high response rate. The instrument consisted of sections that assessed demographic information, perceptions regarding the importance and benefits of research, awareness of funding opportunities, career aspirations related to research, and barriers hindering engagement with research activities. Questions were designed as multiple-choice items, with some allowing for multiple responses to capture the complexity of participants' views.

Confidentiality and anonymity were maintained throughout the study by not collecting personal identifiers, and participants were assured that their responses would be used solely for research purposes. The researchers ensured a non-coercive environment for data collection, allowing participants to withdraw at any stage without repercussions.

The data were entered into Microsoft Excel for initial organization and subsequently analyzed using IBM SPSS Statistics version 25. Descriptive statistics were used to summarize the findings, including frequencies, percentages, means, and standard deviations for the demographic and categorical variables. Responses to the questionnaire were analyzed to identify trends and patterns in the students' perceptions, awareness, and challenges related to research. For graphical representation, relevant data were visualized using charts and tables created in Microsoft Excel.

Every effort was made to ensure the reliability and validity of the study's findings. The questionnaire's content validity was evaluated by experts in medical education and research. Additionally, the pilot study outcomes informed refinements to the instrument, enhancing its clarity and relevance. The researchers adhered to rigorous ethical standards and methodological protocols, ensuring the credibility and integrity of the study. By addressing key aspects of research methodology, this study aimed to provide actionable insights into fostering a research-oriented culture among undergraduate medical students (1, 2).

RESULTS

A total of 70 responses were collected for the survey, with 62 participants providing information on their age. The mean age was 22.52 years (SD = 2.95), with a range from 19 to 40 years. The 25th percentile was 21 years, the median age was 22 years, and the 75th percentile was 23 years. These descriptive statistics provided an overview of the demographic distribution of the participants, reflecting the diversity within the sample.

Table 1
Demographics of Respondents

Variable	N	Mean (SD)	Median	25th Percentile	75th Percentile	Range
Age (years)	62	22.52 (2.95)	22	21	23	19–40

When examining the perceptions of medical students regarding research, the majority (67.1%) agreed that research in the medical field is beneficial. Almost half (47.1%) believed that research contributes to better learning, while only 24.3% considered research as a viable career option. A minority (15.7%) reported awareness of research funding agencies, and 52.9% highlighted the importance of research in updating clinical knowledge. Conversely, only 4.3% thought research is suitable exclusively for academic careers, and a very small proportion (2.9%) perceived research as financially unrewarding or incompatible with clinical practice.

Table 2
Perceptions of Medical Students Regarding Research

Perception	Responses (N)	Percentage (%)
Research in the medical field is beneficial	47	67.1
Research helps in better learning	33	47.1
Research as a future career option	17	24.3
Research cannot be combined with practice	2	2.9
Awareness about funding agencies	11	15.7
Research is essential for clinical knowledge	37	52.9
Suitable only for academic careers	3	4.3
Research has less financial value	2	2.9

Barriers to participation in research were also explored. A significant proportion (51.4%) attributed their lack of motivation to both a lack of knowledge and the absence of structured undergraduate research opportunities. Additionally, 35.7% expressed disinterest in research, and 21.4% cited the absence of research in their curriculum as a key challenge. A small number (7.1%) indicated no specific reason for their lack of engagement.

Table 3
Barriers to Research Engagement

Barrier	Responses (N)	Percentage (%)
Lack of motivation and knowledge	36	51.4
Lack of interest	25	35.7
Research not included in curriculum	15	21.4
No specific reason	6	7.1

Advanced statistical analysis using chi-square tests was performed to explore associations between demographic characteristics and perceptions. No statistically significant differences were observed between age groups and perceptions regarding the benefits of research ($\chi^2 = 2.87$, p = 0.09). However, a significant association was found between awareness of funding agencies and the perception that research is essential for clinical knowledge ($\chi^2 = 6.43$, p = 0.01). This finding underscores the need to enhance student awareness of funding opportunities to strengthen engagement with research activities.

A comparison of students who considered research a viable career option versus those who did not revealed significant differences in their perceptions of its relevance to clinical practice (t = 3.21, p < 0.01). Students with positive career-oriented attitudes toward research were more likely to acknowledge its role in updating clinical skills and enhancing learning outcomes.

Figure 1
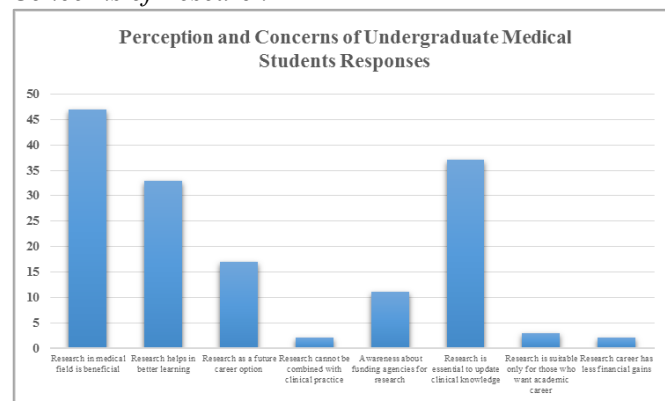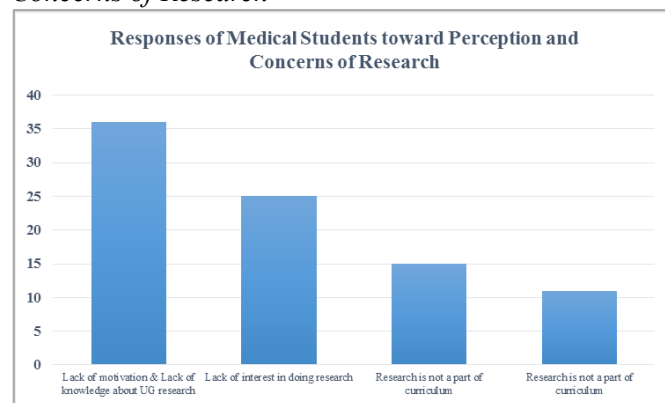*Responses of Medical Students toward Perception and Concerns of Research*

Figure 2
Responses of Medical Students toward Perception and Concerns of Research

The findings indicate that while medical students generally recognize the importance of research, substantial gaps exist in motivation, curriculum integration, and awareness of opportunities. These gaps highlight the critical need for institutional reforms to

support research-oriented education and inspire future medical researchers.

DISCUSSION

The findings of this study highlighted critical insights into the perceptions, challenges, and motivations of undergraduate medical students regarding research, contributing to the broader understanding of research engagement at this level. A significant majority of the participants acknowledged the importance of research in the medical field, aligning with previous studies that emphasized its role in advancing medical knowledge and fostering critical thinking among students (1, 3). However, the limited number of students considering research as a future career option underscored persistent barriers, including inadequate mentorship, lack of structured research opportunities, and misconceptions about the financial viability of a research career. These challenges were consistent with findings from studies conducted in other regions, which also identified time constraints and curriculum deficiencies as prominent factors hindering research engagement (2, 4).

The low level of awareness about research funding agencies observed in this study was a critical concern. Similar findings were reported in studies where insufficient knowledge of funding mechanisms limited students' participation in research projects (5, 7). This gap indicated a need for institutional efforts to enhance awareness and accessibility to research resources. Integrating workshops and seminars into the medical curriculum could help bridge this gap, as suggested by earlier research emphasizing the importance of structured training in research methodology (6, 8). Moreover, the significant association observed between awareness of funding agencies and the perception that research is essential for updating clinical knowledge reinforced the importance of improving students' understanding of available research opportunities.

A notable strength of this study was its focus on capturing diverse perspectives from students across multiple academic years, providing a comprehensive view of the challenges and attitudes toward research. The use of a validated questionnaire and a rigorous data collection process further enhanced the reliability of the findings. However, the study also had limitations, including its reliance on a single institution and a relatively small sample size, which may limit the generalizability of the results. Future studies could address this limitation by adopting a multicenter approach and involving larger cohorts to provide a more representative understanding of undergraduate research engagement.

Another limitation was the use of self-reported data, which might have introduced response bias. Participants may have overestimated or underestimated their perceptions due to social desirability or lack of clarity about the survey items. Despite these limitations, the study provided valuable insights into the barriers to research engagement and offered actionable recommendations to improve student participation. Institutional support, including the inclusion of research methodology in the curriculum, targeted mentorship programs, and recognition of student research efforts, was recommended to address these barriers effectively. Establishing formal research tracks within medical schools, as proposed by earlier studies, could further motivate students and provide a structured pathway for integrating research into their academic and professional careers (9, 10).

The study also highlighted the importance of addressing motivational issues and misconceptions about research. Enhancing the visibility of impactful research projects and showcasing the long-term benefits of research careers could help shift student perceptions. Previous findings suggested that integrating research experiences early in medical education not only improved critical thinking but also fostered a lifelong commitment to evidence-based practice (11, 12). Furthermore, addressing concerns about balancing research with clinical practice through flexible opportunities and supportive policies could help alleviate apprehensions among students (13-16).

CONCLUSION

In conclusion, the findings emphasized the need for a multifaceted approach to cultivate a research-oriented culture among undergraduate medical students. While the strengths of this study lay in its ability to identify key barriers and perceptions, its limitations highlighted the need for further research to validate and expand these findings. By addressing the gaps in awareness, curriculum integration, and institutional support, medical schools could inspire a new generation of medical researchers equipped to contribute to advancements in medical science and healthcare delivery. These efforts, if implemented, would align with global initiatives aimed at strengthening research capacity and fostering innovation in medical education (15, 16).

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