

Original Article**AWARENESS, ATTITUDE & KNOWLEDGE REGARDING RESEARCH METHODOLOGY AMONG UNDERGRADUATE MEDICAL STUDENTS: A SINGLE INSTITUTE, DESCRIPTIVE CROSS-SECTIONAL STUDY**Saba Mahmood¹, Ahmed Saud², Muhammad Adnan Sahoo³**Abstract**

Background: In the medical field, research is essential; without the knowledge and abilities to do research, one cannot progress in their career. Increased postgraduate training enrolment, greater employability, and increased output in postgraduate research are all results of research exposure. The objective of the study was to evaluate their attitude, determine their level of awareness, and comprehend their understanding of research methods.

Material and Methods: Students from all five academic years of MBBS participated in this cross-sectional study, which was carried out at a medical college in Lahore. Convenience sampling was used to choose the 250 study participants, and a questionnaire-based survey was used to gather data. The awareness, attitude, and understanding of the study approach were evaluated using the various criteria. Frequency tables, bar graphs, pie charts, and line graphs were used to display data.

Results: The result showed due to Student's perception of their limited exposure to research, students in their first two years of study lacked awareness. Because just 34% of students are currently involved in any research projects and fewer than half have actual research experience, research skills grow with exposure to research. while over 80% of them wish to take part in research initiatives.

Conclusions: Medical students at the undergraduate level are aware of the advantages of research experience, but they also require a practical grasp of the research methodology. Undergraduate students may not have many opportunities to build their research talents, but they may hone their abilities with the support of their institute's staff and resources thanks to the research-oriented atmosphere.

Key Words: undergraduate; awareness; research methodology; attitude; knowledge.

doi: <https://doi.org/10.51127/JAMDCV0702OA04>

How to cite this:

Mahmood S, Saud A, Sahoo MA Awareness, Attitude & Knowledge Regarding Research Methodology Among Undergraduate Medical Students: A single Institute, Descriptive Cross-Sectional Study. JAMDC, 2025; 7(2);76-82

doi: <https://doi.org/10.51127/JAMDCV07I02OA04>

INTRODUCTION

Medical professionals have always been either scientists or do research to stay afloat in the rapidly expanding medical college landscape.¹

Healthcare policies have failed in the past

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Date of Submission: 07-04-25

Date of 1st Review: 18-04-25

Date of 2nd Review: 31-04-25

Date of Acceptance: 15-05-25

because of a lack of evidence-based and Practical policymaking, including research. Early research involvement in medical school might introduce students to research, spark their interest, and encourage more students to choose careers as physician-scientists.² Conducting high-quality research depends on a number of factors, including financing, training, and advice from mentors who are focused on research. Regretfully, medical students at even Karachi's top medical school report having just a rudimentary understanding of research and a moderate interest in this area of medicine, and they face obstacles due to a lack of good

mentoring.¹ Clinical professionals must use the best available information to support their decisions about the best treatment for their patients or populations in order to practice evidence-based medicine.³ Due to the fierce rivalry for training positions, research experience—especially if it is demonstrated through peer-reviewed publications—is a valuable asset for medical students in particular. It can be challenging to provide undergraduate medical education with chances for the development of varied and effective research abilities.³

Throughout their careers, healthcare professionals have a difficult time staying up to date on the latest developments in clinical practice. For every practicing physician, the concepts of scientific methodology, critical evaluation, and evidence-based medicine (EBM) are crucial in addressing these issues. These programs, which usually involve supervised study in a particular topic area, might be optional alternatives or mandatory as part of the syllabus.⁴ All pupils in the UK are exposed to research concepts through the student-selected components (SSC) curriculum.⁵

Tomorrows Doctors, the Scottish Deans Curriculum group, and the guide to Good Medical Practice USA have all strongly recommended that undergraduate medical students develop research-specific skills in addition to transferable skills like communication, teamwork, time management, and critical thinking.⁵ Numerous causes, including rising educational costs, greater earnings from clinical work, and shrinking research resources due to growing rivalry.

According to the curriculum of the University of Health Sciences, Lahore, student research projects are required in the fourth year of MBBS and fall within the purview of the department of community medicine. In the meanwhile, Continental Medical College is working hard to extend its research projects to all MBBS classes so that graduates can be prepared with research knowledge and adhere to evidence-based practice. Before formally introducing research

instruction, it only makes sense to first gauge their awareness level, attitude, and knowledge of research technique. The objective of this research is to assess medical students' understanding of research at the undergraduate level, to gauge how they feel about conducting research and to gauge their level of expertise in research methods.

MATERIAL AND METHODS

Institutional Review Board (IRB) of Continental Medical College, Pakistan approved the study with reference # 38/IRB/CMC, duration of study was 6 months. This cross-sectional, descriptive study was carried out at Lahore's Continental Medical College, undergraduate medical students were among the study participants. Following institutional review board and ethics committee permission, the sample size was determined using the literature using the formula:⁹ with a total of 250 medical students on the roll, with a 95% confidence level, a 50% chance of success, and 0.05 error margins, to ensure consistency in the data for comparison, a non-probability convenience sampling approach was used to raise the sample, with 50 students from each class.

Medical students in their first through last year of study were included. Those who declined to participate or did not show up on the day of the poll were not included. The questionnaire was a structured, self-administered tool designed to gather quantitative data using a series of close-ended questions. It was divided into key sections: Demographics: gender, age group, year of MBBS, and previous qualifications, Understanding & Attitude: Assesses the students' perception of research and its importance in medical education, awareness & Exposure: Evaluates knowledge about research

practices in their institution and habits around reading medical journals, Interest & Involvement: Gauges willingness to participate in research and the preferred role in a project, Motivation & Self-Assessment: Uses Likert-scale ratings to measure students' motivation and confidence in various research-related skills, the format is designed to facilitate easy analysis and interpretation, with the aim of assessing overall research awareness and preparedness among medical students.

A printed questionnaire created in light of the literature and authorized by the IRB was used to gather data after the individuals gave their consent. We evaluated their knowledge using a five-point Likert scale: 1 meant they had never heard of it, 2 meant they were not confident, 3 meant they were relatively confident, 4 meant they were highly confident, and 5 meant they were extremely confident.

The five questions were straightforward yes/no questions that asked about their prior or present exposure to research. For ease of comprehension, the data were then recoded into three groups: 1–25 = bad knowledge, 26–35 = fair knowledge, and 36–50 = high knowledge. The software SPSS version 25 was used for data analysis. Frequencies and percentages were used to display the data.

RESULTS

The study included a total of 250 participants, comprising 140 males (56%) and 110 females (44%). The age distribution was 17-20 years: 128 participants (51%), 21-23 years: 103 participants (41%) and 24-29 years: were 19 participants (8%). When students were asked about their understanding of the term research, 155 (62%) said it's gathering information and testing hypotheses. Overall, 195 (78%) students feel it's important for them to know about the research methodology. Only 80 (32%) students were of the opinion that their current exposure to research was adequate. (Figure 1).

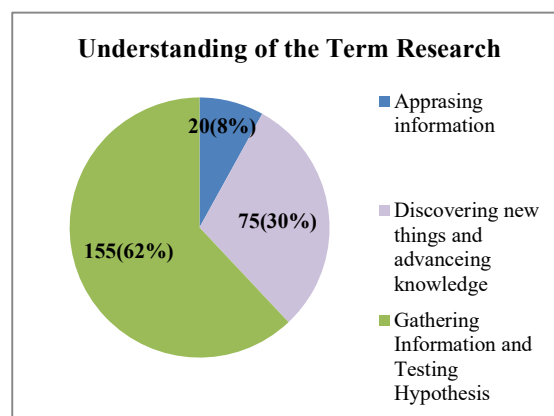


Figure 1: Understanding of the Term Research

When asked about the year of mandatory research where students must complete a research project either independently or in a group to pass the final professional exam of community medicine, 155 (62%) students knew the right answer that 4th-year MBBS is the mandatory research year. Meanwhile, only 105 (42%) students knew about ongoing college research projects. Most unaware students were from the first two years of MBBS. Only 99 (39.6%) students said that they have a habit of reading medical journals. Out of the total 99 students who read medical journals regularly, 73 (73.7%) students were from the last two years of MBBS. (Figure 2).

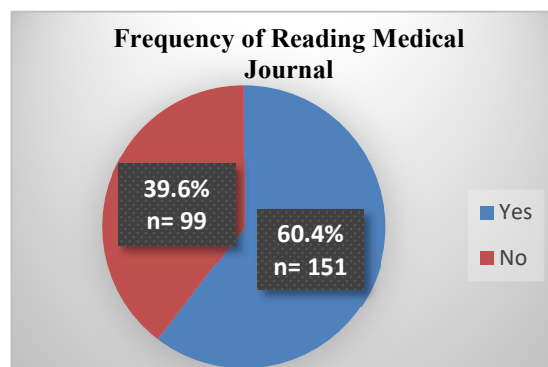


Figure 2: Frequency of Reading Medical Journal

However, only 75 (30%) of students had read their first medical journal before the research year i.e., 4th year. When asked about the frequency of reading medical journals, only 30 (12%) students read medical journals monthly while 30 (12%) students read only once a year. (Figure 3)

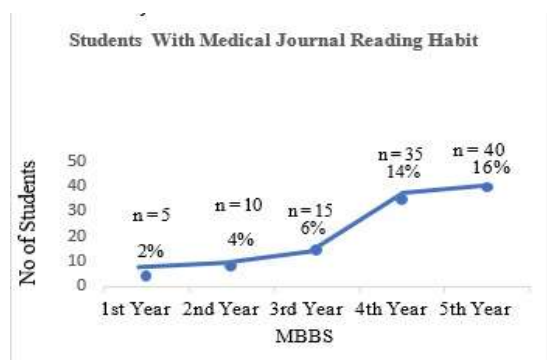


Figure 3: Student with medical journal reading habit

Total of 177 (81%) students showed a willingness to participate in research projects if provided with the opportunity, out of which 18 (45%) students wanted to work as investigator or co-investigator, 8 (20%) and 6 (15%) of students wanted to be data collector and paper writer, respectively. However, 8 (20%) of students showed no interest in doing research. Only 14 (35%) students said that they were part of any ongoing research projects with the maximum number of students from the 4th-year MBBS class. 75 (30%) students had previously participated in research projects in any capacity with the maximum number of students from the final year as they have passed through the research year while 175 (70%) students did not have any practical experience in research. (Figure 4)

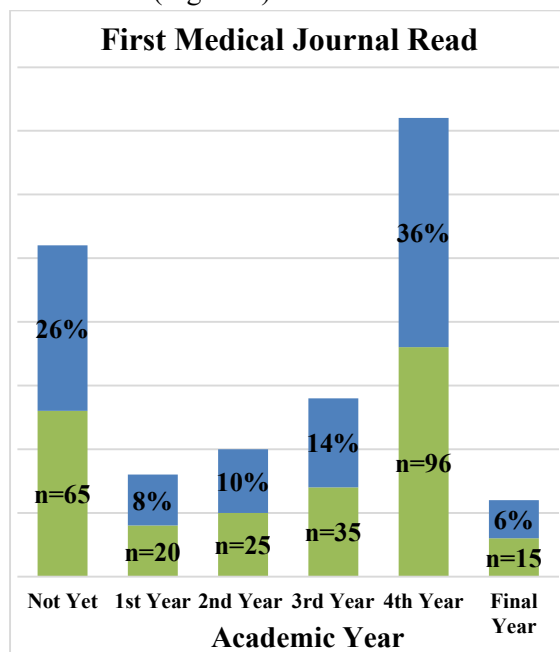


Figure 4: First Medical Journal Read

Ten variables were used to assess the knowledge of students regarding research methodology on 5-point Likert scale (Table 1).

Table 1: Assessment of Student Knowledge of Research Methodology

Variables	Never Heard. (1)	Not Confident (2)	Little Confident (3)	Somewhat Confident (4)	Very Confident (5)
Designing a study	32 (13)	97 (38)	44 (18)	62 (25)	15 (6)
Study Sampling	20 (8)	43 (17)	78 (31)	33 (13)	76 (31)
Participant recruitment	15 (6)	79 (31)	18 (7)	109 (44)	29 (12)
Paper Preparation	30 (12)	42 (17)	86 (34)	55 (22)	37 (15)
Paper Presentation	45 (18)	34 (14)	63 (25)	95 (38)	13 (5)
Communication Skills	55 (22)	99 (40)	36 (14)	29 (12)	31 (12)
Information gathering & evaluation Skills	14 (6)	15 (6)	11 (4)	21 (8)	189 (76)
Teamwork	55 (22)	48 (19)	12 (5)	113 (45)	22 (9)
Project Management Skills	56 (22)	33 (13)	29 (12)	81 (32)	51 (21)
Time management	43 (17)	28 (11)	132 (53)	14 (6)	33 (13)

The scoring system was developed to categorize the knowledge into three categories. The minimum score on the scale was 1 while the maximum score was 50.

Three categories were distributed as follows: Score 1 – 25 = poor knowledge, 26- 35 = fair knowledge, score 36 – 50 = good knowledge. Overall, 62 (25.6%) students had poor knowledge, 152 (60.8%) students had fair knowledge and only 34 (13.6%) students had good knowledge of research methodology in comparing the knowledge of research methodology among all five years of MBBS students, 120 (48%) of 1st year MBBS students had poor knowledge of research methodology while 125 (50%) has fair knowledge and only 5 (2%) had good knowledge. While in 2nd year

the poor knowledge percentage decreased to 80 (32%) while 140 (56%) had fair knowledge and 30 (12%) had good knowledge. However, only 60 (24%) of 3rd year students had poor knowledge while 165 (66%) and 25 (10%) of students had fair and good knowledge respectively. Meanwhile, in 4th year, which is a research year, 50 (20%) of students had poor knowledge, 140 (56%) had fair and 60 (24%) had good knowledge. 5th year, which is the final year of MBBS, 190 (76%) and 50 (20%) of students had fair & good knowledge of research methodology respectively, while only 10 (4%) had poor knowledge.

DISCUSSION

Any curriculum's creation, upkeep, and improvement depend heavily on research.⁹ In order to facilitate targeted learning by identifying the areas that require the greatest development, our primary goal was to evaluate students based on their awareness, attitude, and skills. In the US, the UK, and other countries, undergraduate research is also seen as a vital component of general higher education.¹⁰ 200 (80)% students expressed interest in participating in the research, and the majority of students understood the importance of understanding the research technique. These findings were in line with the study, which found that almost 225 (90%) of students were interested in participating.¹¹ Nearly two-thirds of students believe that their exposure to research is insufficient or irrelevant. 95 (38%) of students, most of whom were from the first two MBBS classes, were unaware of the proper required research year. Most students were unaware of active college research programs, as evidenced by the fact that less than half of them were aware of them. Because the medical sector requires constant learning and progress, reading medical journals on a daily basis helps one come up with creative ideas and stay updated on the most recent studies, research recommendations, and advancements in the area. Just 35 (14%) of students read journals monthly, which is quite concerning because it will be difficult for them to stay up to date with

the most recent findings and advancements. Additionally, 150 (60%) of students were falling behind in this practice. Nearly one-third of students had previously engaged in research of some type, and nearly the same proportion were involved in ongoing research initiatives. However, as we promote evidence-based practice, this figure ought to be far higher. The results were positive, though, since 200 (80%) of students expressed interest in participating in future studies. Given the chance, the majority of them wish to become investigators or co-investigators and gain expertise in conducting research. 186 (74.4%) of students possessed fair to good understanding of research technique, according to their overall knowledge score. With each academic year, medical students' overall scores improved: in their first year 130 (52%), second year 170 (68%), third year 190 (76%), fourth year 200 (80%), and fifth year 240 (96%). This result was in line with a study conducted on American and Saudi Arabian undergraduates that found that students' knowledge increased in accordance with their advanced academic year.¹² This study highlights a generally positive attitude toward research among undergraduate medical students, although notable gaps remain in awareness and practical engagement. These findings align with a study conducted in Karachi University, where students show enthusiasm for research but lack adequate training and opportunities to engage meaningfully in it.¹³ In this study, only 84 (33.6%) students were currently participating in research, and just 75 (30%) had any past experience. This is consistent with results from Egypt, where 110 (44%) medical students could identify the components of a scientific paper, but lack of time was the most addressed barrier for not doing research.¹⁴ A study conducted among medical students at Oujda Medical School Morocco revealed a high level of attitude towards research, but low level of knowledge score. This mirrors the knowledge score findings in this study, where only 13.6% of students had a "good" level of research knowledge.¹⁵ The fact that knowledge scores

got better from first to last year shows that exposure to research has an overall impact. However, the change happened rather slowly, which means that more structured and early approaches are needed.¹⁶ According to this study, 200 (80%) of students are willing to participate in future research projects if provided with guidance and opportunity. Similarly, a large-scale multicenter study in six Arab countries found that students with prior research experience were significantly more likely to have higher knowledge scores and greater willingness to engage in research.¹⁷ The necessity for thoughtful and long-term integration of research training in undergraduate medical education is generally highlighted by these findings. Students' interest and effective research participation can be bridged by early exposure, systematic mentorship, and practical participation in institutional research projects.¹⁸

CONCLUSION

Medical schools must concentrate on incorporating training in specific research skills into every facet of the undergraduate medical curriculum so that students believe these skills apply to the everyday work of all doctors, not just those who conduct full-time research. Every year that goes by, awareness increases, but the improvement is still gradual. Regularly interacting with pupils can help improve this. Although their attitude toward conducting research is generally positive, it is not as strong during the first two academic years, maybe as a result of their first lack of exposure to it.

LIMITATIONS

This is a single institute study so results cannot be generalized to the whole population.

ACKNOWLEDGMENTS

All authors acknowledge the worthy principal Prof. Dr. Ayesha Shaukat for the smooth rolling of this survey and Sana Naz Senior Biostatistician at SMDC, Lahore for the SPSS and results interpretation

CONFLICT OF INTEREST

The authors have no conflicts of interest.

SOURCE OF FUNDING

None

ETHICAL APPROVAL:

Institutional Review Board (IRB) of Continental Medical College, Pakistan approved the study with reference # 38/IRB/CMC.

STUDENTS CONSENT:

Informed verbal consent was obtained from participants before data collection.

AUTHORS' CONTRIBUTION:

SB: Study design, Methodology and Paper writing

AS: Data Collection and Literature review

MAS: Statistical Analysis

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