

Research article

Knowledge, perception, and practice towards scientific research among undergraduate medical studentsRohith Motappa¹, Sanjay R.², Pratham Shetty², Sravesh K.², Cristy M.², Sumith M.², Grishma², Ramesh Holla¹¹Department of Community Medicine, ²Kasturba Medical College, Mangalore, Manipal Academy of Higher Education, Manipal, Karnataka, India

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Corresponding author: **Ramesh Holla**. Email: ramesh.holla@manipal.edu**ABSTRACT**

Introduction and Aim: Healthcare practitioners must stay updated with recent advancements and integrate scientific insights into clinical decision-making for evidence-based medicine. Scientific research faces growing challenges in industrialized and developing nations. Medical professionals in developing countries encounter more obstacles in conducting and disseminating research. This study aims to assess medical undergraduates' awareness, attitudes, and barriers to participating in scientific research.

Materials and Methods: The study took place at Kasturba Medical College (MAHE), Mangalore, involving cross-sectional analysis of medical undergraduates in the 2nd, 3rd, and 4th years of the MBBS program. Eligible participants received a questionnaire via Google Forms with explanatory instructions.

Results: Study participants averaged 21.08 years (standard deviation: 1.53), with ages ranging from 18 to 30. An overwhelming majority (80%) understood the research process well. Approximately 58% believed that scientific research should be mandatory in the medical curriculum. Nearly two-thirds agreed that engaging in scientific research enhances subject understanding. Most students (73.19%) saw the demanding course load as the primary deterrent to undergraduate research involvement, while 67.23% cited lack of time as the main obstacle.

Conclusion: Compared to early-stage students, those further along in their medical education displayed greater familiarity with research and a stronger inclination toward scientific research pursuits.

Keywords: Research; medicine; undergraduate students; knowledge; perception.

INTRODUCTION

The most reliable way to advance science and enhance healthcare service is through research. It is among the best measures of scientific progress in the nation (1). All doctors should be up to date on the most recent advancements and incorporate scientific knowledge (such as research) into clinical decision-making in order to practice evidence-based medicine (2). As a result, doing scientific research has become more problematic in most industrialized and developing nations (3). However, studies have shown that medical professionals in developing countries face more challenges than their counterparts in developed countries when conducting and publishing research studies. These challenges include a lack of a motivational environment and inadequate information, communication, and technological support for research work (4).

The curriculum for medical school in India is still the same, and there aren't many opportunities for long-term research. Undergraduates struggle to grasp research because of their extensive course load, limited exposure to different types of research, and lack of time. Exposing students when they are still undergraduates may help them get ready for upcoming postgraduate degrees and have a positive influence on their career decision (5). Therefore, the goal of this study is to evaluate undergraduate medical students'

knowledge, perceptions, and practices regarding scientific research in order to identify strategies to enhance research among medical science students and foster the development of young researchers. In this background, the study has been undertaken to assess the knowledge, perceptions, and use of scientific research amongst medical undergraduates and to assess the perceived obstacles to research participation.

MATERIALS AND METHODS**Study setting, design and population**

This cross-sectional study was conducted at Kasturba Medical College, MAHE, Mangalore. The study population included medical undergraduates studying in 2nd, 3rd, and 4th MBBS of Kasturba Medical College and the inclusion criteria involved only eligible students who have consented to participate in the study.

Sample size calculation

The sample size was calculated based on a study [5] where 54.5% of medical students were found to have a positive attitude towards mental illnesses and their treatment. Taking 7% absolute precision, the sample size was calculated using the formulae:

$N = (1.96)^2 pq / d^2$ where,

1.96 = standard normal value at a 5% level of significance

N= Sample size, p=proportion (81.7%), q=1-p (0.183),
d= absolute precision (5%)

On calculation, it comes out to be 233, rounded off to 235.

Sampling strategy: Convenience strategy (non-probability sampling)

A questionnaire with four sections was prepared as a Google Form as the data gathering tool. Section A offers general information about the study participants. The questions in Section B concern the participants' knowledge of research. The participant's perception of the research it's the subject of the questions in Section C. Questions on the participant's participation in research programs are found in Section D.

Data collecting methodology

Institutional Ethics Committee (IEC) approval was sought before the commencement of the study. After receiving IEC approval, the dean of Kasturba Medical College in Mangalore granted authorization for students to participate in the study. All of the eligible study participants were emailed a link to the questionnaire developed in a Google Form along with instructions explaining the aim of the study. This link was sent via social media platforms like WhatsApp, Telegram, and others during the months of May and June 2022. Only individuals who had granted consent electronically were permitted to access the self-administered survey, which was requested on the form's first page.

Data analysis

Data entry and analysis was done using IBM SPSS Statistics for Windows, version 25.0, which is a statistical tool for social sciences. Descriptive and inferential statistics were employed to express the results.

RESULTS

Table 1 shows the distribution of the Microsoft soft form to 247 individuals, the sample size for the necessary number of participants was reached. Eight individuals declined to participate, and as a result, they were not included in the study. The study's participants were 21.08 years old on average (SD: 1.53). The age range of the study participants was 18 to 30. The majority (66.8%) of them were between the ages of 20 and 22. Males outnumbered girls by a margin of 53.6% to 43.8%. 59.4% of the population were hostellers. The majority of participants in our study (47.7%) came from the second year of the MBBS program.

The majority (97.4%) of the 235 participants had heard about scientific research, and 82.1% of them had participated in various research orientation programs. The majority of them (80%) had a solid understanding of the steps involved in doing scientific research. The majority of survey participants (59.6%) were aware of search engines where they may find research publications. The most popular one was PubMed, and of those who understood statistical analysis software, 57.4% preferred SPSS as depicted in Table 2.

Table 1: Baseline characteristics of study participants (n= 235)

Parameters		Number (n)	Percentage (%)
Age Group Mean=21.08 ± 1.53	18-19	35	14.9
	20-22	157	66.8
	23-25	42	17.9
	≥ 26	1	0.4
Gender	Male	126	53.6
	Female	103	43.8
	Others	6	2.6
Year of study	2 nd year MBBS	112	47.7
	3 rd year MBBS	63	26.8
	4 th year MBBS	60	25.5
Nationality	Indian	213	90.6
	Foreigner	6	2.6
	NRI	16	6.8
Place of Residence	Hostel	140	59.6
	Private Residence	95	40.4

Table 2: Knowledge of scientific research amongst study participants

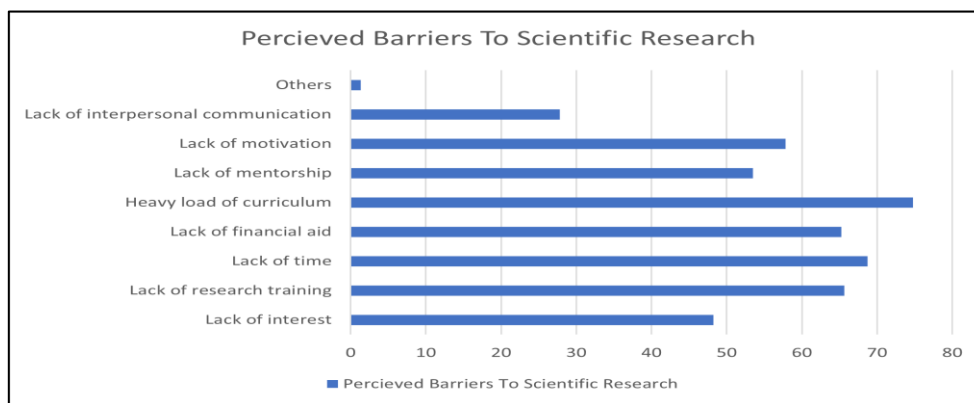
SL No.	Question	Yes (%)	No (%)
1	Have you heard about scientific research?	229(97.4)	6(2.6)
2	Have you attended any research orientation programs?	193(82.1)	42(17.9)
3	Do you have an idea of the procedures to be followed to undertake scientific research?	188(80)	47(20)
4	Have you heard of ICMR short term studentship?	199(84.7)	36(15.3)
5	Do you know of any software used for statistical analysis of data, if yes specify.	135(57.4)	100(42.6)
6	Is it necessary to get the approval of the Institutional Ethics Committee before the commencement of data collection?	217(92.3)	18(7.7)
7	Do you know of search engines that are used to access research papers?	140(59.6)	95(40.4)
8	Have you heard of the Student Research Forum?	211(89.8)	24(10.2)

Table 3: Perception of students towards scientific research

Sl. No.	Question	Strongly agree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	Strongly disagree N (%)
1	It is important to conduct scientific research at the undergraduate level	80(34)	108(46)	39(16.6)	5(2.1)	3(1.3)
2	Scientific research must be made a compulsory part of the medical curriculum	64(27.1)	96(40.9)	53(22.6)	14(6)	8(3.4)
3	Scientific research will help one to enhance their communication skills:	62(26.4)	102(43.4)	56(23.8)	9(3.8)	6(2.6)
4	Scientific research helps build the scientific temperament of a student	68(28.9)	116(49.4)	41(17.4)	7(3)	3(1.3)
5	Scientific research of a subject will enhance one's understanding of the subject:	69(29.4)	112(47.7)	40(17)	8(3.4)	6(2.6)
6	Separate funding and incentives will incline more students toward research	76(32.3)	102(43.4)	46(19.6)	6(2.6)	5(2.1)
7	Scientific research will help students during their clinical practice	56(23.8)	120(51.1)	46(19.6)	7(3)	6(2.6)
8	Background of scientific research will help the student while applying for PG seats	68(28.9)	99(42.1)	53(22.6)	8(3.4)	7(3)
9	Undertaking scientific research is an added burden on undergraduate students	30(12.8)	75(31.9)	71(30.2)	41(17.4)	18(7.7)
10	Lack of proper guidance by professors hinders students from taking research projects	59(25.1)	117(49.8)	42(17.9)	14(6)	3(1.3)
11	The lack of necessary infrastructure to carry out research deters the student from undertaking scientific research	61(26)	120(51.1)	42(17.9)	9(3.8)	3(1.3)
12	Insufficient research skills of students pose a barrier to begin any research	55(23.4)	107(45.5)	61(26)	8(3.4)	4(1.7)

Table 4: Practice of scientific research among students

No.	Question	Yes (%)	No (%)
1	Have you participated (even as a subject) in any research study?	207 (88.1)	28 (11.9)
2	Have you ever undertaken scientific research?	189 (80.4)	46 (19.6)
3	Have you obtained any funding/incentives for your research?	60 (25.5)	175 (74.5)
4	Have you ever presented a research paper?	113 (48.1)	122 (51.9)
5	Have you ever published a research paper in a journal?	71 (30.2)	164 (69.8)



*All numerical values expressed as percentages

Fig. 1: Perceived barriers to scientific research

It is evident from Table 3 that 58% of the students agreed to the fact that scientific research must be made a compulsory part of the medical curriculum. Around 2/3rd of the students concurred that scientific research on a subject will enhance one's understanding of the subject. Almost 3/4th of the study participants opined that scientific research will help students during their clinical practice. However, nearly 60 % of the students declared that undertaking scientific research is an added burden on undergraduate students.

As shown in Table 4, the majority of study participants (88.1%) had taken part in a scientific study, and many (80.4%) had done their own research. Only 25.5% of them had received financial support or other incentives for their work, and only 30.2% had gotten it published. Of these, over half (43.8%) had delivered a research paper

Fig.1 illustrates that the majority of students (73.19%) thought that the demanding course load was the biggest deterrent to undergraduates engaging in scientific research. This is related to the lack of time that (67.23%) of people identified as their main obstacle. A majority also claim that undergrads don't undertake scientific research because of a lack of financial aid (63.8%) and research training (64.26%). The remaining individuals reported a lack of interest in conducting scientific research (47.23%), mentorship (52.34%), and motivation (56.59%).

DISCUSSION

The majority of the participants had some knowledge of performing scientific research and had also gone to workshops for such orientation. The knowledge of search engines and statistical tools used for data analysis was rather common among the participants—about half of the total. These findings are consistent with the study done by Singh *et al.*, (6). The majority of participants engaged in scientific research, but only one-third of them were successful in publishing their findings in a journal. The majority of the students identified a demanding curriculum and a lack of free time as obstacles to taking part in the research. A study done by Pallamparthy *et al.*, (7) had similar findings. In congruence with the study done by Dorji

et al., (8), stakeholders, research guides, and mentors supporting the undergraduates in their research should urge the students not only to undertake great research but also to get it published in journals. In order to ensure a research-oriented environment within institutions, research programs should also be continuously assessed. Undergraduate medical education needs to undergo reforms to lighten the load of the curriculum and provide research opportunities.

The study's findings indicate that while the majority of participants had a good attitude toward research, only a small number of them had excellent knowledge and experience in the field. In comparison to freshly admitted students in the professional course, study participants with higher professional years had better knowledge of the research, and as a result, they were more drawn toward scientific research. To increase the student's awareness of and involvement in scientific research, a competency-based research curriculum should be created in conjunction with the integration of particular research skills training.

CONCLUSION

Engaging in scientific research holds several compelling reasons for students. Firstly, it enhances learning by promoting a deeper understanding of academic subjects and encourages the exploration of complex concepts, which, in turn, nurtures critical thinking, problem-solving skills, and analytical abilities. Secondly, research experience is highly sought after in many career fields, particularly in science, technology, engineering, and mathematics (STEM). It offers students a competitive advantage when they seek employment or pursue advanced degrees. To sum up, scientific research endows students with knowledge, skills, and experiences that not only enrich their academic journeys but also hold substantial value for their future careers and personal growth. Furthermore, it cultivates critical thinking and problem-solving prowess, fostering a lifelong appreciation for the pursuit of knowledge.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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