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Assessment of attitude towards research among the undergraduate medical students from Hyderabad, India: a cross-sectional study

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Abstract

Background: Incorporating research in evidence-based medicine is important for the medical fraternity to understand new diseases, apply new treatment modalities and reform health policies. Including research training in the medical curriculum can help undergraduates to build reasoning skills and critical thinking. Prior studies have shown that despite a positive attitude towards research among undergraduate students, there is a shortcoming in implementing research training. This study was planned to assess the attitude of undergraduate medical students toward research in a publicly funded medical college in South India.

Methods: A cross-sectional observational study was carried out among 63 students by using Attitude Towards Research (ATR) scale, which is a pretested, validated, Likert-type, 32-item questionnaire.

Results: In the present study, 75% of participants were from urban population. 85.7% of students were interested in understanding research methodology and 87.3% were interested in attending advanced sessions. Mean ATR scores revealed that the majority of students have an understanding of the usefulness of research (6.03±0.75), showed a positive attitude towards research (5.51±0.95), and understood the relevance of research (4.57±0.63). At the same time, some found difficulty in carrying out research (4.24±1.23) and reported being anxious of research procedure (4.24±1.01).

Conclusion: Most students are interested in research and wanted to attend training sessions. Students who attended these sessions earlier displayed a positive attitude towards research, showed interest in advanced research methodology sessions, and found research less challenging compared to their peers. If research methodology is incorporated into the medical undergraduate curriculum, it will have a positive impact on the improvement of research orientation of the students. Thus, targeted modules should be formulated for medical students during the undergraduate phase.

Keywords: *medical student attitudes, research interest, research training, research barriers, educational interventions, , cross-sectional study, Hyderabad, India*

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Evidence in Context

• Strong student interest in research methodology and advanced training. • Positive attitudes towards research usefulness reflected by the ATR scale. • Noted challenges in research execution and related anxiety. • Recommendation for research methodology integration into the curriculum. • Need for educational modules to overcome research barriers and foster a research culture.

To view Article

Introduction

Research can be elucidated as investigating and studying materials and sources to establish facts and arrive at new conclusions. With the change in disease trends and the recent pandemic, research is crucial in developing a more thorough understanding of the diseases and various facets of prevention and treatment. The research-oriented approach strongly supports the practice of evidence-based medicine [1,2] which must be incorporated as an important asset for the medical fraternity to combat newer diseases, reform health policies, and apply newer treatment modalities [3]. These will become a crucial component of the medical profession and catalyze a more holistic medical education, creating more physician-scientists connecting the dots between clinical practice and research [1,4]. Medical research helps deliver better and higher-quality medical services. Irrespective of future career, the research experience in the undergraduate phase will help them develop the ability to identify quality articles and critically appraise the medical literature [5].

Research training should be a part of the medical undergraduate curriculum to help them build reasoning skills and critical thinking [6]. Research and academics are complementary to each other. It helps to strengthen written and oral communication skills and information literacy. It also gives an idea about how to select study designs, calculate sample size and the process of data collection [6]. Health research education is an integral component of the medical curriculum as it aids doctors in becomingmore proficient researchers [4]. It is necessary to imbibe these practices in the formative years of the budding physicians. With the recent CBME inclusion, medical undergraduates have been exposed to research methodology and scientific writing. This exposure cannot be completely successful unless the students not only develop a positive attitude toward research but also apply these practices. The attitudes of medical undergraduate students toward research have been the focus of several studies. Despite understanding the usefulness of research, students have diverse opinions about the mandatory research project work during the post-graduate curriculum, which indicates anxiety and difficulty in conducting research [7].

A study done in Saudi Arabia found that students who had the experience of publishing articles at the UG level were three times more likely to pursue the same career path than their counterparts who had no prior exposure. It also showed that lack of proper mentoring and interest were the significant barriers to students being involved and the top three motivators were "joining postgraduate residency programs"(44.8%), "interest in research" (28.7%), and "financial advantages" (10.8%) [8]. Other similar studies deduced barriers as ''insufficient time'' (77.4%), ''absence of organized research courses in the curriculum'' (76%) and ''inadequate mentorship in research'' (70.1%) [9]. A study conducted in Lahore revealed a considerable decline in the number of students doing research in the junior years compared to senior years probably owing to the lack of proper training in how to do research in the junior years [10]. Similarly, studies in Karnataka showed a 60% positive attitude of participants towards research favouring its inclusion in their curriculum; however, they emphasised a lack of awareness (53%), interest (54%) and funding (62%) to be the major shortcomings in the implementation of such training [3]. There was also about 45.9% of the study population having a conflict of allocating time for research amidst the various academic activities [2]. These results should not be viewed only in terms of barriers and motivators but extended to framing a more targeted approach and its further improvement that would help in building a research conducive environment. An interventional study conducted in Mumbai concluded that interventions comprising lectures, group discussions, and field visits showed post-test results as an enhancement in most students' understanding of doing research and comprehending ethics [11].

The factors associated with the attitude of undergraduate students about research are not yet studies broadly. There is a necessity of assessment of the attitude of medical undergraduates towards research. With a myriad of factors cited as barriers and motivators, understanding the attitude of the students will not only help the students to introspect on the same but also direct us towards the appropriate intervention which may be needed to establish research as an important tool in undergraduate training. Hence, the present study was undertaken to assess the attitude of the undergraduate medical students towards the research in a public funded medical college from South India.

Methods

An observational cross-sectional study was undertaken among second-year medical undergraduate students from a publicly funded medical college in Hyderabad, India, during September-November 2022. Complete enumeration of all second-year students who attended the practical postings in the department of community medicine and consented to participate in the study were enrolled. This came to be 63, which was taken as the sample size.

The Attitude Towards Research (ATR) Scale was used among the students. It is a 32-item Likert-type scale with 5 domains looking into the factors of usefulness of research, anxiety towards research, affect showing positive feelings about research, relevancy of research to the student's daily lives, and difficulty of research [12]. The 7-point Likert Scale is scored as 1 for strongly disagree while 7 as strongly agree. ATR is scored domain-wise by taking the mean of the items within that domain for each participant. The higher the score better the attitude. The items on the ATR scale were pre-tested among 10 eligible participants by means of cognitive interviews under the aspects of comprehension and relevancy. The Comprehension of the scale was assessed in a score of 1-3 ranging from 1 as highly clear, 2 as somewhat clear and 3 as not clear while the relevance of the items was assessed in a scale of 1-3, with 1 as relevant, 2 as somewhat relevant, 3 as irrelevant during the cognitive interview. Following this, the participants were re-evaluated for their understanding about the items on the scale. Participants having any discrepancy in understanding the item on the scale or having a score of 1 or 2 were explained the intended meaning as well as asked to suggest an alternative phrase or word for the item that can be understood by their peers from the community. With the participants' verbal consent, the qualitative comments were written down and captured on audio. Following the cognitive interview, the item(s) that over 20% of participants had flagged as unclear (not clear/somewhat clear andirrelevant (irrelevant/somewhat relevant) were rephrased based on the analysis of their qualitative inputs, and reevaluated among ten additional study participants.

We conducted further sessions of these cognitive interviews by modifyingthe items based on feedback from the prior rounds' participants. This continued until we attained an adequateproportion (≥80%) of the participantshaving comprehension and relevancy for each item. The second-year undergraduate students who were posted in the community medicine department were asked to participate in the study. After obtaining consent the final questionnaire was self-administered under the supervision of a trained interviewer to the students. The procedure was explained and the research was carried out in the College building. The students were asked to complete the scale in a fixed duration of time, ensuring all questions had been answered.

Data was collected in printed forms and entered in MS Excel. Analysis was undertaken in SPSS 26.0 (Trial version). Descriptive statistics in the form of percentages for categorical variables and mean (SD) and median (IQR) for the continuous variables were calculated. The domain scores of the ATR scale were found to be skewed through Kolmogorov Smirnov test. Hence, Mann-Whitney test and Kruskal Wallis test was used to test significance in difference in the ATR scores and the categorical variables. A p value of <0.05 was considered statistically significant.

The data was collected from the participants only after obtaining written informed consent. The Institutional Ethics Committee approval was obtained before carrying out the research, after providing adequate details about the study.

Results

A total of 63 students participated in the study. The mean age of 20.37 and the majority of the study population were females (58.7%). The maximum number of students belonged to the urban areas (75.4%), and amongst all the participants, the majority had place of origin as Telangana (60.3%). Detailed socio-demographic features are listed in Table 1.

Most of the students were interested in knowing more about research methodology (85.7%) and were interested in attending advanced sessions (87.3%). Among those appealing to attend advanced sessions, the topics most chosen were Literature search (69.8%), Literature review (68.3%), referencing software (63.5%), Sample Size calculation (58.7%), Ethics in medical research (58.7%), Sample Size techniques (54.0%) and Statistical analysis (46.0%). [Table 1]

Table 1: Socio-demographic profile of the study participants (N=63)

	Frequency	Percentage
Mean Age = 20.37	63	
Gender		
Male	26	41.3
Female	37	58.7
Type of student		
Hosteler	41	65.1
Days Scholar	21	33.3
Medium of School Education		
English	62	98.4
Mother-tongue	1	1.6
Place of Origin		
Rural	8	12.7
Urban	45	71.4
Semi-urban	10	15.9
State of Origin		
Telangana	38	60.3
Others	25	39.7
Future Department of Specialisation		
Clinical Medical	15	23.8
Clinical Surgical	23	36.5
Not yet decided	25	39.7
Are you interested in knowing more about research methodology?	54	85.7
Are you interested in attending advanced sessions on research methodology?	55	87.3
If yes, please select the topics you want to attend:		
A) Literature search	44	69.8
B) Literature review	43	68.3
C) Sample Size Calculations	37	58.7
D) Sample Size Techniques	34	54
E) Ethics in Medical Research	37	58.7
F) Statistical Analysis	29	46.0
G) Referencing Software	40	63.5

Amongst the domains of the ATR Scale, the majority of students favoured the usefulness of research (6.03±0.75) followed by the attitude (5.51±0.95), relevance (4.57±0.63),

Difficulty (4.24±1.23) and anxiety (4.24±1.01) domains. [Table 2]. Thus, students with different levels of research experience understand the use of research and show a positive attitude towards research even though they show some level of anxiety towards the research and find the research methods somewhat difficult.

Table 2: Attitude toward research among the study participants (N=63)

ATR Domains	Mean (SD)	Median (IQR)
Usefulness	6.03 (0.75)	6.11 (5.56, 6.56)
Anxiety	4.24 (1.01)	4.25 (3.50, 5.00)
Attitude	5.51 (0.95)	5.62 (4.75, 6.12)
Relevance	4.57 (0.63)	4.50 (4.25, 5.00)
Difficulty	4.24 (1.23)	4.33 (3.33, 5)

We couldn't find any significant association between the socio-demographic factors and the usefulness domain of the ATR scale. [Table 3]

Table 3: Association between the usefulness domain of ATR and socio-demographic characteristics of the students

	Mean Rank	P-value
Gender		0.115
Male	27.67	
Female	35.04	
Type of student		0.216
Hosteler	29.48	
Days Scholar	35.45	
Place of Origin		0.123
Rural	33.44	
Urban	34.16	
Semi-Urban	21.15	
Medium of School Education		0.270
English	31.68	
Mother tongue	52.00	
Future Department of Specialisation		0.370
Clinical Medical	33.53	
Clinical Surgical	35.26	
Not yet Decided	28.08	
State of Origin		0.240
Telangana	34.20	

Others	28.66	
Have you ever attended any research methodology course/training?		0.12
Yes	46.17	
No	29.64	
Have you ever conducted (including ongoing research) any research so far?		0.969
Yes	32.50	
No	31.98	
Have you ever presented any research findings at conferences or symposiums?		0.820
Yes	27.75	
No	30.59	
Are you interested in knowing more about research methodology?		0.096
Yes	28.14	
No	44.50	
Are you interested in attending advanced sessions on Research Methodology?		0.489
Yes	30.48	
No	35.75	

Attending research methodology courses/training in the past had a significant association with low anxiety towards research (p=0.002) [Table 4].

Table 4: Association between anxiety domain of ATR and socio-demographic characters of the students

	Mean Rank	P-value
Gender		0.834
Male	32.58	
Female	31.51	
Type of student		0.426
Hosteler	32.80	
Days Scholar	28.95	
Place of Origin		0.959
Rural	30.25	
Urban	32.26	
Semi-Urban	32.25	
Medium of School Education		0.093
English	31.51	

Mother tongue	62.50	
Future Department of Specialisation		0.931
Clinical Medical	32.43	
Clinical Surgical	32.87	
Not yet Decided	30.94	
State of Origin		0.232
Telangana	29.76	
Others	35.40	
Have you ever attended any research methodology course/training?		**0.002**
Yes	49.50	
No	29.58	
Have you ever conducted (including ongoing research) any research so far?		0.224
Yes	47.50	
No	31.49	
Have you ever presented any research findings at conferences or symposiums (Oral/Poster Presentations)?		0.067
Yes	52.75	
No	29.73	
Are you interested in knowing more about research methodology?		0.453
Yes	28.61	
No	36.00	
Are you interested in attending advanced sessions on Research Methodology?		0.240
Yes	30.12	
No	39.08	

The students who had attended research methodology courses/training in the past had a significant association with a positive attitude towards research ($p<0.001$). They also showed significant interest in attending the advanced research methodology sessions. ($p=0.017$) [Table 5].

Table 5: Association between attitude domain of ATR and socio-demographic characters of the students

	Mean Rank	P-value
Gender		0.224
Male	28.65	
Female	34.35	
Type of student		0.812

Hosteler	31.89	
Days Scholar	30.74	
Place of Origin		0.105
Rural	27.00	
Urban	35.00	
Semi-Urban	22.50	
Medium of School Education		0.093
English	31.51	
Mother tongue	62.50	
Future Department of Specialisation		0.112
Clinical Medical	29.97	
Clinical Surgical	38.24	
Not yet Decided	27.48	
State of Origin		0.504
Telangana	33.25	
Others	30.10	
Have you ever attended any research methodology course/training?		**<0.001**
Yes	53.22	
No	28.46	
Have you ever conducted (including ongoing research) any research so far?		0.937
Yes	33.00	
No	31.97	
Have you ever presented any research findings at conferences or symposiums (Oral/Poster Presentations)?		0.180
Yes	46.75	
No	29.94	
Are you interested in knowing more about research methodology?		0.543
Yes	29.31	
No	23.33	
Are you interested in attending advanced sessions on Research Methodology?		**0.017**
Yes	32.78	
No	14.67	

There was no significant association between the sociodemographic factors

And the relevance domain of the ATR scale [Table 6]. Students had a similar understanding of the relevance of the research.

Table 6: Association between the relevance domain of ATR and socio-demographic characters of the students

	Mean Rank	P-value
Gender		0.202
Male	28.52	
Female	34.45	
Type of student		0.812
Hosteler	30.91	
Days Scholar	32.64	
Place of Origin		0.308
Rural	38.81	
Urban	32.20	
Semi-Urban	25.65	
Medium of School Education		0.374
English	31.74	
Mother tongue	48.00	
Future Department of Specialisation		0.103
Clinical Medical	37.57	
Clinical Surgical	34.74	
Not yet Decided	26.14	
State of Origin		0.505
Telangana	33.24	
Others	30.12	
Have you ever attended any research methodology course/training?		0.090
Yes	41.50	
No	30.42	
Have you ever conducted (including ongoing research) any research so far?		0.373
Yes	20.75	
No	32.37	
Have you ever presented any research findings at conferences or symposiums (Oral/Poster Presentations)?		0.406
Yes	40.50	
No	30.16	

Are you interested in knowing more about research methodology?		0.052
Yes	27.82	
No	50.17	
Are you interested in attending advanced sessions on Research Methodology?		0.412
Yes	30.39	
No	36.58	

There was a significant association between prior exposure to research methodology courses and the difficulty domain of the ATR scale. Thus, students who had attended a research methodology class found research to be of less difficult than their peers. (p=0.022) [Table 7].

Table 7: Association between difficulty domain of ATR and socio-demographic characters of the students

	Mean Rank	P-value
Gender		0.377
Male	34.42	
Female	30.30	
Type of student		0.681
Hosteler	30.83	
Days Scholar	32.81	
Place of Origin		0.297
Rural	23.25	
Urban	32.61	
Semi-Urban	36.25	
Medium of School Education		
English	31.51	
Mother tongue	62.50	
Future Department of Specialisation		0.918
Clinical Medical	30.47	
Clinical Surgical	32.98	
Not yet Decided	32.02	
State of Origin		0.390
Telangana	30.39	
Others	34.44	
Have you ever attended any research methodology course/training?		**0.022**
Yes	44.89	
No	29.85	

Discussion

The present study found most of the undergraduate students to be interested in knowing more about research methodology (85.7%) and wanted to attend advanced research training (87.3%), with the topic most desirable to be literature search (69.8%) and literature review (68.3%). In our study, the majority of students favoured usefulness followed by attitude and relevance. Studies were corroborating the interest of students in research coming up to 90% [3] which has been supported by similar studies in Saudi Arabia stating a moderate attitude amongst 53.8% [13] as well as a positive attitude, reported by studies conducted using ATR scale [14]. A similar study using the ATR Scale conducted in the UK highlighted a positive attitude towards research [15].

A study conducted on 31 undergraduate students in Saudi using the identical ATR Scale similarly found the usefulness domain to be the most favoured among them followed by attitude and anxiety. These findings are similar to ours wherein usefulness had the highest mean of 6.03, followed by the attitude domain having a mean of 5.51[14]. Similarly, in the study done by Bin-Ghouth A et al [16] 65.7% of individuals have agreed to the usefulness and relevance of research. Combining the above results, we can infer that the positive attitude of the students may be because they found the research methodology courses to be useful and relevant. This can be extended to planning appropriate teaching modules that will incorporate usefulness and relevance of research. For example, building knowledge of research will help in creating a positive attitude towards research among undergraduates in general.

Our study also showed that those who had previously attended research methodology courses had lesser anxiety as well as better attitude. There have been previous literature displaying high anxiety of students towards research [17]. Our finding provides a reasoning such that prior exposure to research methodology will be helpful in alleviating the anxiety amongst students, which may be helpful in promoting a more positive attitude to research. This emphasizes the importance of introducing research methodology courses early on during undergraduate training. This will help to improve the research orientation of the students now at the undergraduate level, as well as at the post-graduate level.

There was also a significant finding about the difficulty amongst the undergraduates towards research training. The difficulty in research as found in our study may be attributed to the barriers that have been identified in a multitude of studies with lack of time being the most significant barrier to overcome[8] Also, potential barriers that may constitute the reasons might be a lack of mentoring or lack of proper training for igniting interest in the minds of the undergraduates. Attending a research methodology course previously had shown a significant reduction in the difficulty of conducting research among the students, reiterating the utility of such a session in improving the overall attitude of the studies. These barriers serve as opportunities to plan programmes and courses tailored to address the same and help the undergraduates to overcome them and pursue research.

The association between relevance and interest of students in knowing more about research methodology leads to the fact that prior exposure to research training not only improves the attitude of students, and alleviates anxiety but also makes them realise the relevance of the same. This can be utilised to plan educational policies and programmes wherein courses focussing on research will foster a better student outlook on research.

The major strength of our study is that it addresses an important aspect of educational development in the medical undergraduate curriculum. This study gives a practical insight to the need to add research methodology sessions to the same. The major limitation of our study was that it was restricted to a study population of second-year students attending the community medicine posting and not the entire undergraduate population at large. As the data is self-reported there can be biases. Also, the various possible perceived barriers and motivators for research need to be addressed to comprehend this study's results further. ATR scale is a relatively simple and useful tool for assessing attitudes towards research. This can be used in any similar settings. This study can be extended further by conducting an intervention of research methodology training and incorporating a post-test measurement of the students' attitude which would help to evaluate the efficacy of the intervention applied.

Supporting information

None

Ethical Considerations

The data was collected from the participants only after obtaining written informed consent. The Institutional Ethics Committee approval was obtained before carrying out the research, after providing adequate details about the study.

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All authors attest they meet the ICMJE criteria for authorship and gave final approvalforsubmission.

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Data included in article/supp. material/referenced in article.

Additional information

No additional information is available for this paper.

Declaration of competing interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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