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Original Research Article

Do our medical undergraduates need to develop research skills? Assessing perceptions, attitudes and skills of medical undergraduates

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ABSTRACT

Background: The development of research capacity at undergraduate level is essential to produce good quality researchers in the long run. The core curriculum must ensure that relevant and appropriate research expertise is attained by all graduates who are then provided with a suitable foundation from which they can develop such specialized research skills as may be required in their careers.
Methods: A cross sectional study was conducted in Terna Medical College, Nerul, Navi Mumbai from May 2016-September 2016. All students of second and third year who willingly participated were included in the study. Preformed pretested and validated proforma was used. For checking attitudes a standard attitudes towards research scale was been used which contained 32 questions.
Results: 74.9% said that research methodology should be the part of curriculum. 37.7% said that they would like to opt a carrier as a researcher. 70.6% students either identified no opportunities, gave no response or didn't know about opportunities. Biggest barriers identified were lack of knowledge (36.5%), lack of time (34.7%), lack of infrastructure (25.1%). Correlation coefficients between ATR sub-scales were also calculated.
Conclusions: Students' want to conduct research at undergraduate level and want incorporation of research methodology in curriculum. Lack of knowledge, time and resources are common barriers while opportunities, majority are not aware about it. Though students find research difficult and are anxious about it, they have positive attitude towards conducting research.

Keywords: Research skills, ATR scale, Physician researcher

INTRODUCTION

There has been concern in recent years about a decline in the number of new physician-scientists worldwide. Many factors, such as increasing cost of education, higher financial returns from clinical careers, reduction of research budgets with increased competition for research funding, may have contributed to this decline.[1] Poor training of medical students in developing research skills as Indian medical curriculum does not include research related portion practically. Advances in bio-medical research during the last decade have highlighted the necessity of attracting greater numbers of physicians to careers that include a research component. Physician participation in research is essential to increase the number of clinical and research studies performed.[2] Medical research is conducted insufficiently and those research which are conducted, many times have a question of quality. Also in India, the medical researches are many times irrelevant to needs of the community or country. Medical students do not get sensitized towards conducting research as they are not aware about research opportunities. The development of research capacity at

undergraduate level is essential to produce good quality researchers in the long run.[2] The core curriculum must ensure that relevant and appropriate research expertise is attained by all graduates who are then provided with a suitable foundation from which they can develop such specialized research skills as may be required in their careers.[3] With this background in mind, current study has been conducted.

Objectives

- To find out perceptions of medical students regarding research & research skills
- To study opportunities and barriers in conducting research at undergraduate level
- To find out medical student's attitude towards research.

METHODS

A cross sectional study (for need assessment) was conducted in Terna Medical College, Nerul, Navi Mumbai from May 2016- September 2016. All students of second and third year who willingly participated were included in the study. Total 167 students were included in a study who gave consent. Preformed pretested and validated proforma was used to gather the information about perception, attitude and practice of research amongst medical undergraduates.

For checking attitudes towards research a standard attitudes towards research scale was been used which contained 32 questions which are broadly divided into 5 main domains called

- Research usefulness (9 questions).
- Research anxiety (8 questions).
- Positive attitudes towards research (8 questions).
- Relevance in life (4 questions).
- Research difficulty (3 questions).[4]

Students' response was recorded on a Likert scale from 'strongly disagree' 1 to 'strongly agree'. Domain wise scoring was done for analysis. Written consent was taken. Data analysis was done using Microsoft office excel and SPSS version 20, by applying Pearson's Co relation and Euclidean distance model (Table 1).

Table 1: Attitudes towards research (ATR) Scale.

Question	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. Research is useful for my career					
2. Research is connected to my field of study					
3. Research should be indispensable in my professional training					
4. Research should be taught to all students					
5. Research is useful to every professional					
6. Research is very valuable					
7. I will employ research approaches in my profession					
8. The skills I have acquired in research will be helpful to me in the future					
9. Knowledge from research is as useful as writing					
10. Research is stressful					
11. Research makes me anxious					
12. Research scares me					
13. Research is a complex subject					
14. Research is complicated					
15. Research is difficult					
16. I feel insecure concerning the analysis of research data					
17. Research makes me nervous.					
18. I enjoy research					
19.I like research					
20. I am interested in research 21. Research acquired knowledge is as useful as arithmetic					
22. Research is interesting.					
23. Most students benefit from research					
24.I am inclined to study the details of research					
25. I love research					
26. Research-orientated thinking plays an important role in everyday life					
27.Research thinking does not apply to my personal life-					

Continued.

Question	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
28. Research is irrelevant to my life					
29. I use research in my daily life					
30. I have trouble with arithmetic					
31. I find it difficult to understand the concepts of research-					
32.I make many mistakes in research					

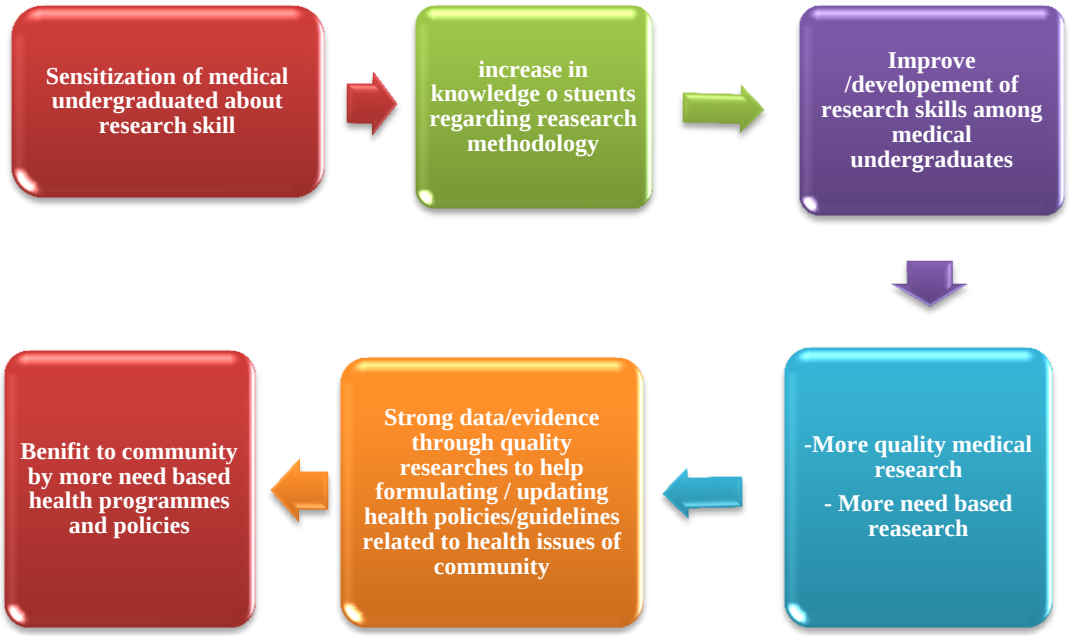

Figure 1: Concept map of why we need to develop research skills amongst medical undergraduates.

RESULTS

Total 167 students participated in the study. Amongst them 65 (38.9%) were males and 102 (61.1%) were females. The mean age of 167 students was 20.33 years (SD±1.48).

Only 18.6% students have conducted research at undergraduate level and 6.5% knows about funding agencies. Three fourth of students (74.9%) said that research methodology should be the part of curriculum. 63 (37.7%) said that they would like to opt a carrier as a researcher. 112 (67%) students showed interest in conducting research at undergraduate level.

By studying opportunities in conducting research, 70.6% students either identified no opportunities, gave no response or didn't know about opportunities. Only 8 students knew about funding agencies. Only 7 stated guidance by teacher as opportunity for conducting research (Figure 2).

Biggest barriers identified by students were lack of knowledge (36.5%), lack of time (34.7%), lack of infrastructure (25.1%). Other barriers were burden of current studies, lack of support/guidance by teacher and lack of communication skills. Only 4.7% student said lack of interest as a barrier (Figure 3).

Correlation coefficients between the attitudes toward research sub-scales were also calculated. The research usefulness factor was most highly correlated with the factor of positive attitudes toward research (r=0.59) and research anxiety (r=0.36). The anxiety subscale was most highly correlated with the research difficulty (r=0.41) factors and with the positive attitudes (r=0.37) (Table 3).

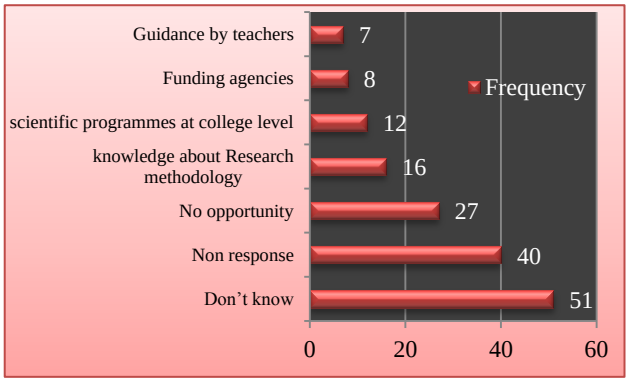

Figure 2: Opportunities in conducting research (multiple responses).

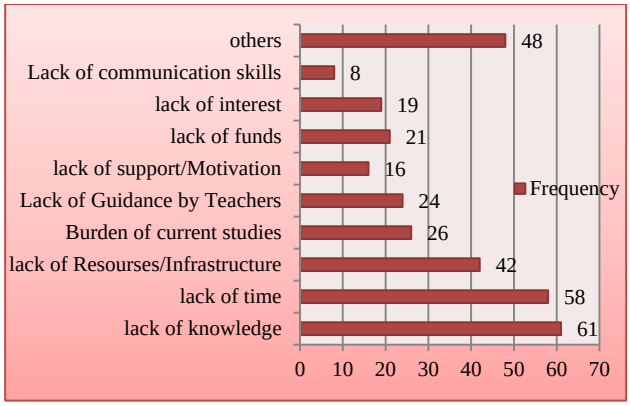

Figure 3: Barriers in conducting research (multiple responses).

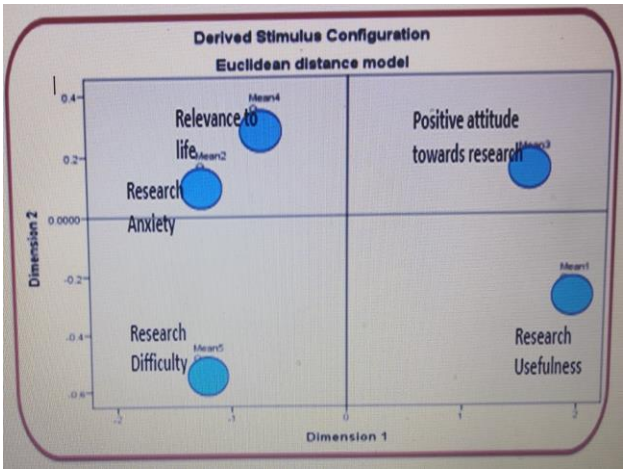

Figure 4: Euclidian distance model.

Euclidian distance multidimensional analysis was done. This is to show that research anxiety could possibly stem from other factors that have nothing to do with whether the students consider research to be useful in their lives or not (Figure 4).

Multidimensional scaling was used in order to be able to display multivariate data (the five factors in this case) on a lower two-dimensional space. This is done by mapping the distances between points in a high dimensional space into a lower dimensional space (Johnson, 1998).

Four clusters are resulted by the use of this model (Figure 4). Projecting the points of each of the factors on of the axis reveals two different groups of factors.

Table 2: Dimensions used in Euclidian distance model.

Dimension 1	Dimension 2
Group 1: Research difficulty with research anxiety and relevance to life.	Group 1 factors of research anxiety, relevance to life and positive attitudes
Group 2: Research usefulness and positive attitudes towards research	Group 2 factors of research usefulness and positive attitudes toward research.

This distinction again shows that on the one hand research anxiety and difficulty seem to interrelate, while the positive attitudes toward research appear to group together with the usefulness of research.

Overall however, by looking at the two dimensions it is clear that the usefulness of research factors are constantly grouped together, and are never grouped together with the research anxiety factor. This is to show that research anxiety could possibly stem from other factors that have nothing to do with whether the students consider research to be useful in their lives or not.

Table 3: Co relation matrix between five domains of ATR scale of the students.

Research domains	Research usefulness	Research anxiety	Positive attitude towards research	Relevance to life	Research difficulty
Research usefulness	r=1.000				
Research anxiety	r=-0.361 p=<0.000*	1.000			
Positive attitude towards research	r=0.595 p=<0.000*	r=-0.370 p=<0.000*	1.000		
Relevance to life	r=-0.042 p=0.591	r=0.146 p=0.060	r=-0.033 p=0.673	1.000	
Research difficulty	r=-0.085 p=0.273	r =0.419 p=<0.000*	r=-0.139 p=0.073	r=0.101 p=0.195	1.000

In addition, positive attitudes toward research are never grouped together with the factor of research difficulty. This again shows that there are different factors that can possibly influence the student's attitudes toward this subject, that have nothing to do with whether they consider a research methods course to be difficult or not.

DISCUSSION

Study by Alghamdi et al, of the participating students, 55.3% (88/159) participated in research during medical school.[5]

In a study conducted by Khalid Alghamdi et al.,the majority of the students agreed that research is important in the medical field (97.1%, 167/172). The majority also agreed that conducting research during medical school is important (87.7%, 151/172). Many students (67.4%, 116/172) believed that conducting research should be mandatory for all medical students, and 91.9% (158/172) believed that research methodology should be a part of the medical school curriculum.[5]

71.25% students had never participated or carried out any research work, whereas 19.37% students had been involved in research previously.[6]

In a study conducted by Kumar et al, Students cited many reason for their not being involved in research in addition to curriculum like 'shortage of time' (52.1%), lack of financial/academic benefit (56.3%), not interested to undertake research as a career (32.4%), 'want to be a clinician only (37.8%), 'doctor should work in hospital (24.3%),' no idea about research career (29.6%).[7]

Euclidian distance curve observations from a study by Meraj et al, the factor structure of attitudes towards research scale comprised five factors.[8]

Regarding usefulness of research, 72 (41.9%) students did not consider it a good career choice despite the fact that 113 (65.7%) agreed that research was very useful, 120 (69.8%) said it was helpful, 95 (55.3%) said it should be a part of undergraduate curriculum, and 96 (55.8%) said it should be incorporated in professional training.[8]

The second factor included three items related to stress and tension and, hence, was labelled as research anxiety. Majority agreed that research was stressful 120 (69.8%) and complex 107 (62.2%). Besides, 58 (33.7%) agreed that that they felt insecure in research analysis, 66 (38.4%) had a neutral response and 48 (27.9%) did not agree. There was no statistically significant gender difference in the item response, but second year students considered it more stressful (p=0.02) and felt more insecure in research activity (p=0.014).

The third factor, which included 2 items, was called positive attitudes towards research, and 71 (41.3%) enjoyed research, 55 (32%) were neutral, while 46 (26.7%) didn't agree. Besides, 46 (26.7) agreed that students benefit from research. Female students considered it more beneficial (p=0.007) than their male counterparts, while no difference in first and second year students was recorded.

The fourth factor referring to the use of research in daily life was labelled relevance to life. More than half 110 (64%) agreed that research was related to their daily life and 156 (90.7%) agreed that research was important to discover new things. No significant difference in response with regard to gender or class was observed.

The fifth factor research difficulty included two items. Almost half 79 (45.9%) disagreed that the concepts were difficult to understand, while 49 (28.5%) found it difficult. Most were of the opinion that they would make mistakes during the research 69 (40.1%). No gender difference in the response was observed, but second year students considered it more complex (p=0.01).[8]

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