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IS THERE A REQUIREMENT OF IMPROVED RESEARCH SKILLS INUNDERGRADUATE CURRICULUM? A CROSS SECTIONAL STUDY ON ATTITUDE AND BARRIERS TOWARDS RESEARCH

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ABSTRACT

Introduction*:** Research in today's time and age has been a very crucial part of medical science due to increase in the range of various diseases and increased demand for better treatment and care in the present age. Therefore, various studies have found that education of and conduction of researches at an undergraduate level has shown an increased inclination of these students towards research based studies in the future. ***Methods: A cross- sectional study was conducted on undergraduate studentsat Krishna Institute of Medical Sciences. A questionnaire was completed by 140 students; addressing 6 factors, consisting of 24 questions: assessing the attitude and barriers of research. ***Results:*** 67.1% said that research methodology should be the part of curriculum. 40.7% said that they would like to opt a career as a researcher. Biggest barriers identified were lack of interest in research, Lack of communication skills, lack of time to do research because of educational tasks and so on. ***Conclusion:*** A potential manner to minimize the issue at hand i.e, a decreased interest in research related project could be reversed by initially creating an awareness among students regarding the need of brilliant doctors in the area of research and increasing the provision of resources required for the same.

1. INTRODUCTION

The concern towards scientific research has increased in both developing and developed countries because biomedical research can improve medical care. Research training is a critical element of education in the medical field. Research in medicine has an impact on prevention, diagnosis, and newer treatment for the medical ailments.[1] Medical colleges are expected to train students in research to meet accreditation standards, to support students' career prospects and to generate a pool of researchers. A long-term strategy for promoting health research is to target medical students early in their careers so that, they are equipped with sufficient research training during their undergraduate studies. This will promote their critical thinking, will develop critical appraisal skills so they become research-oriented.[2] 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.

Medical research is conducted insufficiently and those research which are conducted, many times have a question of quality.[3] Adequate knowledge of the study subject and awareness of research principles are essential prerequisites for any study. Some previous studies of medical students showed that they had inadequate knowledge of the scientific inquiry process, but that they were nonetheless interested in pursuing research in the future.The final factor directly affecting the performance of research lies in the barriers against researchers. The main parameters reported in the literature as barriers to research among medical students included: inadequate knowledge of study design or interpretation of study results, time limitations. Other factors mentioned as barriers include: lack of research training uncertainty about the ability to successfully complete a study (lack of research self-efficacy), little support from mentorship, lack of interest in research and limited access to data sources (i.e. internet), materials and equipment.[4] Involvement of undergraduates in research was less, so this study was planned to determine the factors and their perception toward the same.[1]

2. AIM

To assess knowledge, attitude and the barriers towards research among medical undergraduates.

3. OBJECTIVES

a. To study the attitude of undergraduates towards research
b. To evaluate the opportunities and barriers in conducting research
c. To find the perception of medical students regarding research

4. MATERIALS AND METHOD

A cross sectional study was conducted in Krishna Institute of Medical Sciences, Karad, Maharashtra. Third year first term students were selected as they were exposed to research processes like ICMR short term Students research projects and institutional research projects.

Sample size was calculated by taking the prevalence of 18.6% (i.e. students who conducted research) in a study conducted in Terna Medical college, Nerul, Navi Mumbai[3]

a. Prevalence (p)=18.6%
b. q= 100-p
c. Allowable error (L)=7

According to the formula $4\times p\times q \div L2$, the required sample size for the study was 123 students but total 140 students of third year 1st term who were present and who were willing to participate in the study were included.

A questionnaire was developed to collect six factors of information from the students to assess the knowledge, attitude and barriers towards research which consisted of 24 questions.

Factor 1: Relevance of research to my everyday life Factor 2: Relevance of research to my personal interests
Factor 3: Relevance of research to my educational needs
Factor 4: Research usefulness to my work Factor 5: Research anxiety
Factor 6: Research difficulties.

All items in the questionnaire were constructed using Three-point Likert response scales of agree, neutral anddisagree. Each point on the Likert scale is assigned a value of (1=agree) (2=neutral)(3=disagree).[2]
Students were asked to fill the questionnaire.

Ethical clearance was obtained from Institutional Ethical Committee before conducting the study.

The data was entered in Microsoft excel spreadsheet.Data analysis was done using IBM Statistical Package for the Social Sciences (SPSS®) version 20 software. Mean and standard deviation (SD) of each parameter was calculated. Throughout the study $p < 0.05$ was considered statistically significant.

5. OBSERVATION AND RESULTS

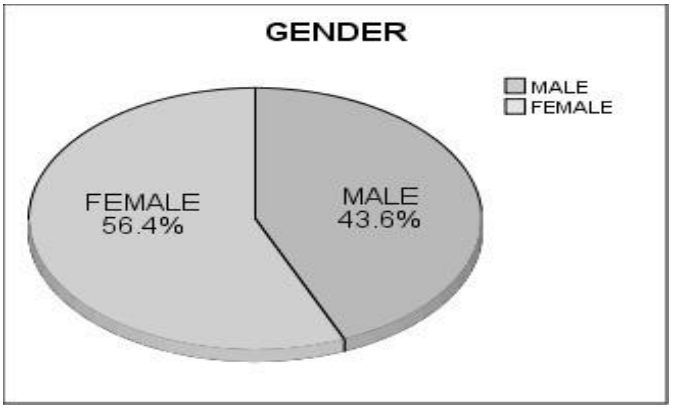

Figure 1: Gender distribution in the study population.

Total 140 students participated in the study.

Amongst them 61 students (43.6%) were males and 79 students (56.4%) were females. More number of females in the study group shows their interest in attending lectures sincerely.

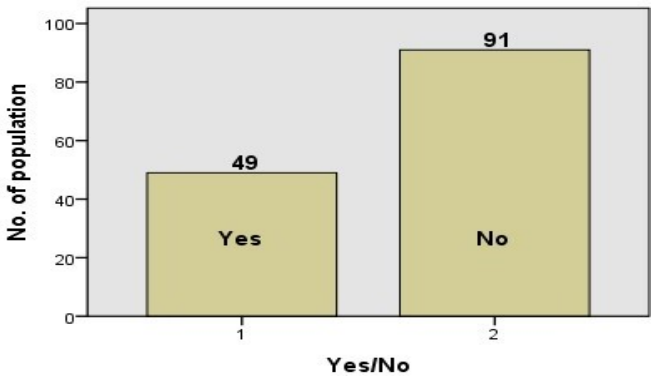

Figure 2: Research done by the study population.

49 students (35%) have conducted research. Remaining 91 students (61%) have not conducted a research, may be due to lack of adequate awareness and unavailability of necessary resources.

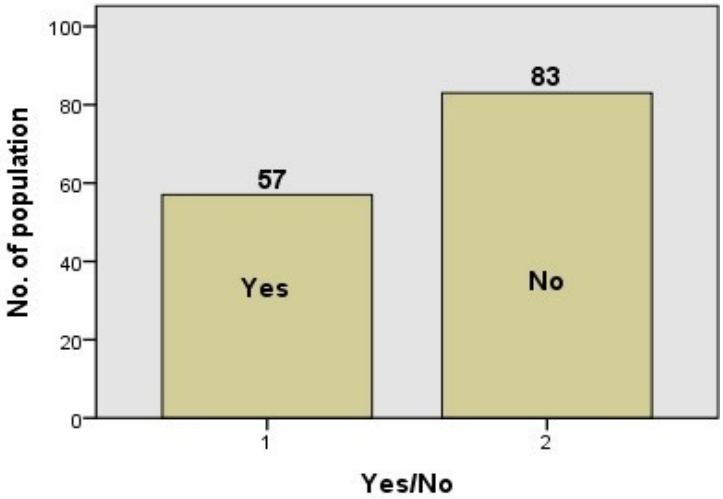

Figure 3: Students who would like to opt a career as a researcher.

Only 57 students (40.7%) said that they would like to opt a career as a researcher. Others are not ready, may be due to less opportunities in research, less payment and more workload etc.

Table 1: Mean and Standard deviation of the items included in factor (1) for evaluating attitude towards research (N=140).

Item	Mean	Standard Deviation
Science gives us a better understanding of the world	1.08	0.319
Every student should be familiar with the scientific research	1.21	0.461
Knowledge is necessary to achieve true results from scientific research	1.10	0.301
We have a healthier life with less discomfort with scientific research	1.42	0.601
I trust the research results are reported to the public	1.76	0.718
Direct thinking and reflection on research plays an important role in my life everyday	1.48	0.605
Thinking about scientific research is dull and boring	2.39	0.696

"Thinking about scientific research is dull and boring" gained the highest perception and "science gives us a better understanding of the world" gained the lowest perception. The above findings can be coherent to the fact that there is a lesser practical approach to scientific studies (Table 1).

Table 2: Mean and standard deviation of the items included in factor (2) for evaluating attitude towards research (N=140).

Item	Mean	Standard Deviation
Taking time to perform research is time wasted	2.56	0.692
Research is beneficial, because it improves my critical thinking	1.24	0.463
I would like to do research even if it is not in the training program	1.57	0.636

"Taking time to perform research is time wasted" gained the highest perception and "Research is beneficial, because it improves my critical thinking" gained the lowest perception. From this we can understand that students lack a clear understanding of how to incorporate research findings into their learning process.

Table 3: Mean and standard deviation of the items included in factor (3) for evaluating attitude towards research (N=140).

Item	Mean	Standard Deviation
I perform research as part of my educational course work	1.53	0.673
Skills that I gain during research are useful in my future	1.26	0.489
Research should be offered in training to all students in studies classes	1.28	0.524

"I perform research as part of my educational course work" gained the highest perception and "Skills that I gain during research are useful in my future" gained the lowest perception. Research work has been promoted only as a means to complete the course work.

Table 4: Mean and standard deviation of the items included in factor (4) for evaluating barriers towards research (N=140)

Item	Mean	Standard Deviation
Lack of interest in research	2.32	0.712
Lack of time to do research because of educational task	1.70	0.717
Prefer to use the free time to do other tasks	1.71	0.662

"Lack of interest in research" gained the highest perception and "Lack of time to do research because of educational task" gained the lowest perception. The above data findings, call for the need to incorporate the research work into the curriculum.

Table 5: Mean and standard deviation of the items included in factor (5) for evaluating barriers towardsresearch (N=140).

Item	Mean	Standard Deviation
Fear of making mistakes in research and being blamed by others	1.94	0.794
Performing research is a complex matter	1.51	0.662
Lack of confidence in my potential for completing research	1.97	0.813

"Lack of confidence in my potential for completing research" gained the highest perception and "Fear of making mistakes in research and being blamed by others" gained the lowest perception. This shows the importance of necessary guidance and supervision required for those taking part in research work.

Table 6: Mean and standard deviation of the items included in factor (6) for evaluating barriers towardsresearch (N=140).

Item	Mean	Standard Deviation
Lack of good research ideas	1.87	0.803
Lack of access to laboratory equipment for performing research project	1.70	0.746
Lack of professional supervisors (mentors)	1.81	0.776
Lack of communication skills	2.10	0.780
Lack of familiarity with statistical analysis	1.72	0.730

"Lack of communication skills" gained the highest perception and "Lack of access to laboratory equipment for performing research project" gained the lowest perception. From the given data and understanding can be drawn to the need for increased awareness and promotion for conducting researches. Teachers active participation is also important to make students to develop interest in research and to improve their communication skills.

Table 7: Mean and standard deviation of the factors for evaluating attitude towards research (N=140).

Factor	Number of items	Mean	Standard Deviation
Factor 1:Relevance of research to my everyday life	7	1.49	0.17103
Factor 2: Relevance of research to my personal interest	3	1.79	0.11964
Factor 3: Relevance of research to my educational needs	3	1.36	0.09757

Table 8: Mean and standard deviation of the factors for evaluating barriers towards research (N=140).

Factor	Number of items	Mean	Standard Deviation
Factor 4:Research usefulness to my work	3	1.91	0.03016
Factor 5: Research anxiety	3	1.81	0.08199
Factor 6: Research difficulties	5	1.84	0.02895

Overall, it revealed that the students' perception for Factor 4 (Research usefulness to my work) was the highest where Factor 3 (Relevance of research to my educational needs) gained the lowest perception (Table 7 & Table 8).

94 students (67.1%) said that research methodology should be the part of curriculum.

6. DISCUSSION

Research is an extremely crucial in advancement and improvement of health care services provided to the public. This study aimed to assess perceptions and barriers of undergraduates toward medical research.[5]

In our study of 140 students from third year (1st term), 61 students (43.6%) were males and 79 students (56.4%) were females. Whilst, similar studies conducted in other medical colleges around the country have shown a greater prevalence of males in comparison to females.[6,7,8,9]

Only 35% have conducted research at undergraduate level, this when compared to study conducted in a medical college in Mumbai where only 18.6% students took part in research studies, shows that there is an increased interest and participation from the students of our college.[3]Opinion given by the students for the importance of research were

a. To increase the knowledge and understanding regarding the prevalence of various diseases and health problems.
b. To increase facility and to better the approach in modern medicine.
c. Conducting research work as an undergraduate aids in getting a better understanding of doing the same during postgraduate studies in India, where doing a thesis on particular topic are mandatory. Another reason for performing these studies during undergraduate course is that, it works as an asset during application for higher studies in outside countries.

In the present study maximum students' opinion regarding factor 1 was that scientific research is dull and boring; with an average mean of 2.39, and less number of students said that "science gives us a better understanding of the world", with an average mean of 1.08. Whereas in a similar study conducted in Saudi Arabia[2] an average mean of 4.57 students found "Knowledge is necessary to achieve true results from scientific research" and an average mean of 3.8 students stated "We have a healthier life with less discomfort with scientific research".

On taking factor 2 into consideration, a maximum number of students were of the opinion that it was a wastage of time in conducting a research with an average mean of 2.56, and less number of students said that "Research is beneficial, because it improves their critical thinking", with an average mean of 1.24. Whereas in a similar study conducted in Saudi Arabia,[2] an average mean of 4.46 students found "Research is beneficial, because it improves their critical thinking" and an average mean of 2.9 students found "Taking time to perform research is time wasted". Results from the above study are controversial to the present study.

On taking factor 3 into consideration, a maximum number of students were of the opinion that performing research is a part of their educational course work; with an average mean of 1.53, and less number of students said that "Skills that they gain during research are useful in their future", with an average mean of 1.26. Whereas in a similar study conducted in Saudi Arabia,[2] an average mean of 4.38 students found "Skills that they gain during research are useful in their future" and an average mean of 4.08 students found "They perform research as part of their educational course work". Results from the above study are controversial to the present study.

On taking factor 4 into consideration, a maximum number of students were of the opinion of "Lack of interest in research"; with an average mean of 2.32, and less number of students said "Lack of time to do research because of educational task", with an average mean of 1.70. Whereas in a similar study conducted in Saudi Arabia,[2] an average mean of 4.35 students found "Lack of time to do research because of educational task" and an average mean of 3.67 students found "Lack of interest in research". Results from the above study are controversial to the present study.

On taking factor 5 into consideration, a maximum number of students were of the opinion of "Lack of confidence in their potential for completing research"; with an average mean of 1.97, and less number of students said that "Performing research is a complex matter", with an average mean of 1.51. Whereas in a similar study conducted in Saudi Arabia,[2]an average mean of 3.84 students found "fear of makng mistakes in research and being blamed by others" and an average mean of 3.66 students found "lack of confidence in my potential for completing research".

On taking factor 6 into consideration, a maximum number of students were of the opinion of "Lack of communication skills"; with an average mean of 2.10, and less number of students said "Lack of access to laboratory equipment for performing research project", with an average mean of 1.70. Whereas in a similar study conducted in Saudi Arabia,[2] an average mean of 3.99 students found "lack of familiarity with statistical analysis" and an average mean of 3.63 students found "lack of professional supervisors".

Only 40.7% students said that they would like opt a career as a researcher. According to recent findings, the drop in the number of researchers is due to various factors. Primarily, due to lack ofinterest and varied number of options with better opportunities are available to them, still there is a decrease in the number of job opportunities in this particular field. Also due to a constraint in the amount of resources in the form of money and kind (lab equipments, professional supervisors). Another reason being inadequate time and space allotted forresearch work in the medical curriculum. From the above reasons what can be deciphered is that research is a complex and detailed study of particular matters which require major supervision, necessary material and time to draw adequate conclusion for the same; due to a lack of availability of these factors there has been a significant dip in the number of students approaching research work.

7. CONCLUSION AND RECOMMENDATIONS

Based on the study that we have conducted, we draw the conclusion that research work has been carried out by less number of students (35%), and the number of students who are interested in research work is also at a lower gradient of 40.7%, suggesting the decreased interest amongst the students of 3rd year (1st term) in carrying out research work. A potential manner in which this issue at hand could be reversed is by initially creating an awareness among students regarding the need of brilliant doctors in the area of research considering the fast growing arena of modern medicine, where newer

diseases and pathologies are being discovered with an increase in the demand for methodologies to tackle them. Anothermanner is by incorporating research work into the syllabus or by creating a sufficient amount of time period during which the same can be carried out, this inference has been made based on the findings of our study which shows that 67.1% students said that research methodology should be the part of curriculum. Apart from this, a major obstacle that pupils face is that they fall short of resources such as money and other necessities like lab equipment which are essential in performing the task at hand. Medical universities should be advised to come up with a system to provide students interested in the research with formerly mentioned needs, such as scholarships. Last but not the least, students at the undergraduate level are not equipped with the acceptable amount of knowledge and understanding to perform research work as they are novice's to the field and hence should be assured to have substantial supervision and guidance with the assignment.

Hence we conclude that by the implementation of the above mentioned methodologies, there may be a significant improvement in the number of students approaching research work.

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