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Knowledge, Attitude, Practice and Barriers for Research amongst Medical Students of GMC, Nagpur

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ABSTRACT

Background & purpose: Medical research paves a way towards this evidence-based medicine. Experience of research in an early time in the medical profession is associated with continued professional academic work and may also help resident's career decisions. The present study was carried out to assess the knowledge, attitude and practice of medical research amongst medical students and also the potential barriers in carrying out the medical research.

Materials & methods: It was a cross sectional study conducted at Government Medical College, Nagpur, India from January 2020 to February 2020 amongst 156 medical students. A pretested, validated, self-administered questionnaire with 31 questions that assessed knowledge, attitude, and practice of conducting research was used for data collection. Statistical analysis was carried out by IBM SPSS software version 24.0.

Results: Out of 156 subjects, 61% and 69% had a positive attitude and a good level of knowledge about research respectively. Knowledge regarding the online databases where the research articles can be searched was poor (27.5%). Only 8.4% students have conducted a research project amongst which only 5.7% of the students have published their study. Lack of time (75%), lack of proper guidance (68%), and lack of funding (67%) were some important barriers limiting their research practice. Most of the students (39%) have suggested to include research in medical school curriculum 35% of them have thought of the necessity to improve awareness about research.

Conclusions: Various measures like conducting a hands-on training course on research methodology, organizing research workshops, frequent research presentations, and journal clubs to provide knowledge and skills needed to implement the scientific research should be undertaken to up bring the practice of research.

Key words: Research, Attitude, Barriers, Medical Students

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INTRODUCTION

In view of changing pattern of disease, evidence-based medicine is very crucial in modern medicine to prevent and treat the medical ailments. Medical research paves a way towards this evidence-based medicine [1,2]. Research enables a person to analyze the information critically and come out with a conclusion which is an important aspect in clinical decision-making and patient care. Hence, the medical students should be carrying out research actively as they will be future doctors who will have to practice this evidence based medicine in patient care [3]. Undergraduate research has a good impact on the academic career. It is essential to inculcate critical thinking and reasoning skills and to develop positive attitudes towards scientific research amongst medical students from the beginning of their career [4]. Experience of research in an early time in the medical profession is associated with continued professional academic work and may also help resident's career decisions [5,6]. Moreover, it provides necessary skills to the future research in their career and strengthens lifelong learning [4,5,7,8]. The medical education system in India concentrates mainly

on preparing more and more basic doctors who were trained in allopathic sciences, but seldom promotes research activities. Students in India have almost no formal pathway to become physician-scientists [3,5,9,10]. Although opportunities to participate in research, such as the short-term scholarships (STS) supported by Indian Council of Medical Research (ICMR) and Kishore Vaigyanik Protsahan Yojana (KVPY) have boosted the research projects undertaken by medical undergraduates, still there is lack in the research quantity and quality [9,11,12]. Review of literature suggests that Indian medical students have a keen research interest and are ready to be nurtured [13]. Although there has been a practice of medical research among undergraduate level, Students face a lot of difficulties that hinder their quest for participating in research endeavors[1,3-5,9-11]. Lack of research training and professional supervisors, less time due to vast curriculum, less exposure to research methodology and lack of motivational rewarding environment at the institution are some of the most important obstacles in conducting research [5,9,11]. Studies have reported that the practice of research was very low amongst medical students and their knowledge towards medical research was also moderate [1,14] Knowledge of undergraduate medical students about research has been little explored. Studies which assessed the practice have not explored attitude toward medical research and much of the barriers faced [4,15,16]. With this intent, the present study was planned to address the gap by assessing knowledge, attitude, practice, and barriers altogether. The objectives of the study were to assess the knowledge, attitude and practice of medical research amongst medical students and also the potential barriers in carrying out the medical research.

MATERIALS AND METHODS

The present cross sectional study was conducted at Government Medical College, Nagpur, India from January 2020 to February 2020. The study population was intern students of Bachelor of Medicine and Bachelor of Surgery (MBBS). Approval from institutional ethics committee was obtained prior to the study. Sample size was calculated based on the prevalence of research practice and moderate knowledge score obtained by previous studies [3, 4-7] and total 156 students were included in the study. A pretested, validated, self-administered questionnaire that assesses knowledge, attitude, and practice of conducting research was used for data collection. The study tool consists of 31 questions under five sections. Section I consisted of general information such as age, sex, academic year, education, and occupation of parents. Section II comprised questions, which assesses the knowledge about medical research such as, research hypothesis, research protocol, and sources of research. Section III assessed the attitude towards medical research using 5-point Likert scale. Section IV of the questionnaire was framed to find the practice of medical research among medical students by asking them whether they have conducted any medical research, accessed peer reviewed journals, attended/ presented in any conferences, and published their work in any journals. Section V assessed and explored the barriers faced by them in conducting medical research. Statistical analysis was carried out by IBM SPSS software version 24.0.

RESULTS

The age of the patient varied from 22-26 with average age being 23±1.5. Female students were 34%, 13.5% and 2.5% of the students had at least one parent's occupation as teacher, doctor, and scientist respectively. %. Most of the students (69%) did their schooling from urban area (Table-1). A five point Likert scale was used to assess the attitude towards research (Table-2).

Among the 156 study participants, 52% of the subjects strongly agreed that research enriches medical education and contributes to innovations in medical field (62%). Majority of the students, 80% and 72% of the students agreed that research helps in better understanding of the subject and one's clinical practice later respectively. Hence, more than half of the students (62%) stated that research should be a part of their MBBS curriculum. However, few students strongly agreed that it was an extra burden to do research (20.5%) and it was time consuming and disturbed their studies (14%). Only few students (11%) strongly agreed that medical research

can be pursued as an exclusive job career. The correct knowledge regarding the basic concepts of scientific research was very high, as 73.7% of the respondents could correctly define 'scientific hypothesis. Awareness of government sponsored fellowship or studentship for undergraduate students doing a biomedical research project such as Indian Council of Medical Research-Studentship (ICMR-STS) was very high(66.7%). Knowledge regarding the online databases where the research articles can be searched was poor (27.5%). PubMed Central was the most frequently stated database (14.7%). The other databases quoted by students were Medline (4.5%), MedScape (3.8%), Research Gate (3.2%) and Science Direct (1.2%). Most of the respondents also showed correct knowledge regarding various sections of a research article, such as introduction (72.5%) and acknowledgement (76.2%) (Table-3).

Only 8.4% students have conducted a research project amongst which only 5.7% of the students have published their study. 11% of the students have attended research methodology workshops or conferences, but only 6.4% of them have presented their paper in research conference. Adequate practice of medical research was found in 60 (17.4%) of students. Significant number of students (41%) has searched the medical journals online/library for articles, but only 9.6% had the habit of following them regularly (Table 4).

With regard to barriers, most of the students had stated lack of time (75%), lack of proper guidance (68%), and lack of funding (67%) as barriers limiting their research practice. Other barriers revealed were difficulty in choosing topic (55%), difficulty in data analysis(51%), inaccessibility to review of literature(49%), difficulty in writing in proposal(47%), lack of interest(46%), difficulty in writing report(42%), and getting approval from review boards(37%). All (100%) of the study participants have faced at least one barrier (Figure-1). Various suggestions given by students to improve research practice were tabulated (Figure 2).

Most of the students (39%) have suggested including research in medical school curriculum. Most of the students (35%) have thought that there is a necessity to improve awareness about research amongst students. The other important suggestions given by students were increase in encouragement by faculty (10%), improve in research funding (4.5%), and proper guidance from their mentors (11.5%).

Table 1: Demographic variables of study subjects.

Variables		n=156	%
Age M ± SD		**23 ± 1.5**	
Gender	Male	76	49%
	Female	80	51%
Parent's occupation(at least one as)	Doctor	21	13.50%
	Scientist	4	2.50%
	Teacher	53	34%
	Others	78	50%
Schooling	Urban area	108	69%
	Rural area	48	31%

Table 2: Distribution of study participants according to attitude towards medical research.

Attitude questions	Strongly disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (28.4%)	Strongly agree n (32.75%)
1. Research enriches medical education.	4(2.5%)	5(3.2%)	19(12.1%)	47(30%)	81(52%)
2. Research helps in the improving one's curriculum vitae.	3(1.9%)	4(2.5%)	20(12.8%)	62(40%)	67(43%)
3. Research contributes to innovations in medical field.	2(1.2%)	1(0.6%)	17(10.8%)	39(25%)	97(62%)
4. Scientific research should be a part of MBBS curriculum.	19(12.1%)	6(3.8%)	35(22.5%)	46(29.5%)	50(32%)
5. Research will help in better understanding of subject.	2(1.2%)	3(1.9%)	25(16%)	60(38.4%)	66(42.3%)
6. Research will help one's clinical practice later.	5(3.2%)	8(5.1%)	31(19.8%)	55(35.2%)	57(36.5%)
7. It is an extra burden to do research.	18(11.5%)	32(20.5%)	47(30.1%)	27(17.3%)	32(20.5%)
8. Research is time consuming and disturbs studies.	16(10.2%)	36(23%)	45(29%)	38(24.3%)	22(14.1%)
9. Financial prospects are good for research career.	17(11%)	26(16.7%)	53(34%)	38(24.3%)	22(14.1%)
10. Can consider medical research as an exclusive future job career option after medical school completion.	29(18.5%)	36(23%)	43(27.5%)	31(19.8%)	17(11%)

Table 3: Distribution of study participants according to knowledge about medical research.

Sr No.	Knowledge questions	Yes n(63%)	No n(3%)	Don't know n(34%)
1	A research hypothesis is a specific, testable prediction and is verifiable by statistical and analytical means.	115(73.7%)	2(1.3%)	39(25%)
2	ICMR-STS is a government-sponsored fellowship offered to medical students.	104(66.7%)	3(1.9%)	49(31.4%)
3	Can you name some online databases where you can search for research articles?	43(27.5%)	00(0%)	113(72.5%)
	PubMed	23(14.7%)		
	Research Gate	5(3.2%)		
	Medscape	6(3.8%)		
	Science direct	2(1.2%)		
	Medline	7(4.5%)		
4	Introduction should clearly state the hypothesis that you investigated.	113(72.5%)	9(5.7%)	34(21.7%)
5	Acknowledgment to persons who assisted you during the research is the part of a scientific paper.	119(76.2%)	11(7.1%)	26(16.6%)

Table 4: Distribution of study participants according to practice of medical research.

Sr No.	Practice Question	Yes n (%)	No n (%)
1	Did you Participate in any workshops on research methodology, lab research or any other similar workshops.	17(11%)	139(89%)
2	Have you ever searched for medical journals at library/online?	64(41%)	92(59%)
3	Have you ever conducted a medical research project?	13(8.4%)	143(91.6%)
4	Have you done a scientific paper presentation in a conference?	10(6.4%)	146(93.6%)
5	Have you published any of your research studies in a journal?	9(5.77%)	147(94.2%)
6	Do you read journals regularly?	15(9.6%)	141(90.3%)

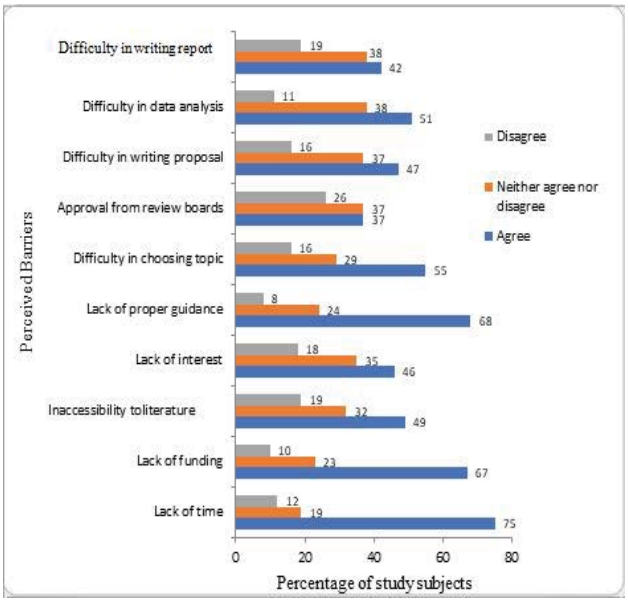

Figure 1: Participants' opinion on barriers of research.

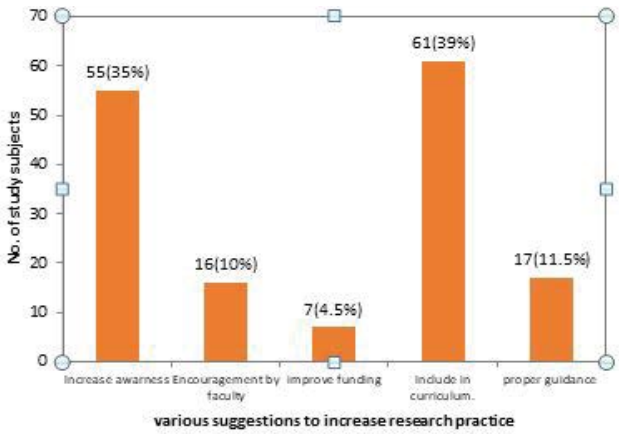

Figure 2: Various suggestions given by participants to increase research practice amongst medical students.

DISCUSSION

Research is an extremely important element in the advancement of better health care services provided to the public. An adequate level of knowledge, positive attitude, and reasoning skills play an important role in carrying out research [17]. The present cross-sectional study was conducted to assess the knowledge, attitudes, and barriers toward the practice of scientific research amongst undergraduate medical students of GMC, Nagpur. The knowledge questions asked about the basic principles of scientific research, medical online research databases, and the structure of a scientific article. We found that 69% of the students had correctly answered the knowledge questions and considered to have a good level of knowledge. 34% and 3% of them had no idea and incorrectly answered the questions of knowledge respectively; hence, a total of 37% had a poor level of knowledge. This finding was similar to previous studies conducted by Srivani et al. [3] in India and Noorelahi et al. [17] in Saudi Arabia which showed 70% and 69% prevalence of good level of knowledge amongst medical students. However, a study conducted by Hassan et al., [18] in Pakistan showed the prevalence of a good level of knowledge to be only 49%. Only 29.5% of the students knew about online medical research databases and PubMed was the single resource known to most of them (52%). This finding was supported by a study conducted in Chennai by Chellaiyan VG et al., [1] which showed that 20% of the students had the proper knowledge of various online medical research databases. Encouragingly, out of 156 medical students, a positive attitude towards medical research has been shown in about 61% in our study. Many of the cross-sectional studies conducted amongst medical students also demonstrated moderate and positive attitudes toward research. 16-18 The Majority of the students agreed that research enriches medical education (82%) and helps in one's clinical practice later (72%). Most of the students showed a positive view of researching to improve their curriculum vitae (83%). A recent study conducted by Noorlein MM et al. [17] stated that 86% of the students agreed that research is essential and patient outcome improves with continued medical research (76%). However, the percentage of students who would consider research as an exclusive future career option was significantly low (31%). This is in contrast to other studies, which showed that 82% conducted by Chellaiyan et al. [1] and 68% conducted by Noorelahi MM et al., [17] agreed to consider research as their exclusive career option respectively. This could be due to the widely prevalent notion in our society that financial prospects for research are considerably less compared to clinical practice [19-21]. This is also reflected in their attitude where only 38% of students agreed that financial prospects were good for a research career. Attraction towards clinical practice on one hand, together with poor awareness and motivation for research, in a set-up where there is poor institutional and monetary support; medical undergraduates are bound to neglect research [9]. Despite having good knowledge and a positive attitude towards research, the practice of research was found to be significantly low in the current study (8.4%) and only 6.4% of them had participated in scientific paper presentations at the conference. This is significantly less when compared to other studies conducted both within India and out of India. Chelliyan et al. [1] showed that more than half of the students have carried out at least one research project (59%) and 28% of them participated in scientific paper presentations. Similarly, the practice rate of research was 54% and 33% in studies conducted by Hassan et al. [18] and Alsuhaibani et al. [15] respectively. The reason behind the lower rate of practice in the current study could be attributed to their attitude towards few elements of research namely, a significant number of students thought that it was an extra burden to do research (38%) and it was time-consuming and disturbed their studies (39%). It could also be attributed to the fact that students face a lot of barriers that hinder their quest for participating in research endeavors [1,3-5,9-11]. This low practice of research could be averted by reinforcing the fact that perceiving research is also a way of learning. Although a special emphasis was given for the promotion of scientific research, the presence of barriers leads to the gap between theory and practice. There were many barriers that directly or indirectly discourage medical students from getting involved in the research. In our study, the majority of the students (75%) considered a lack of time as the main potential barrier in practicing research. A study done by Giri et al.

[22] in Central India showed that 59.5% found lack of time due to the curriculum as a barrier in conducting a study incomparable with our study (75%). Similarly, the study was done by Satav et al., [23] showed that 60% found a lack of time as a barrier in conducting the research. A study conducted by Osman TA et al. [19] also infers that insufficient time (68.3%) was the main principle barrier in conducting research. Inadequate financial grants to carry out the research were also opined as a strong barrier by 67% followed by a lack of proper guidance, and difficulty in choosing the topic. Moreover, the students (49%) mentioned that they had limited access to the relevant medical and electronic databases which made them difficult to pursue their research activities. Studies from India, Arabian countries, and Pakistan have reported similar findings regarding barriers to research. These barriers need to be addressed by providing encouragement by faculty, proper guidance, research funding, and awards and providing access to electronic databases to encourage undergraduate students to participate in research activities. Students, who feel the medical curriculum to be overburdened, should understand that research provides the opportunity to learn through inquiry rather than the simple transmission of knowledge. Those who think they lack the free time to involve in research should understand that research certainly widens their career opportunities. Most of the students (62%) suggested that research should be incorporated into the medical school curriculum in order to increase the practice of research amongst students. There were many studies which stated that students recommended to include research in their MBBS curriculum [1,3,5,15,17,18]. The other suggestions given by students have increased the awareness about research, proper guidance, encouragement by faculty, and improving funding.

CONCLUSIONS AND RECOMMENDATIONS

In the current study, the knowledge regarding research was high amongst medical students and their attitude towards involvement in research activity was highly encouraging. The practice was significantly low during their undergraduate studies as only a handful of students had journal publications and conference presentations. Lack of time, skills, funding, and facilities and were the major barriers. From the students' points of view, the main reasons for lack of research activities were lack of time, funding, limited access to relevant medical journals and databases, and insufficient supervisory support. Many of them recommended that research needs to be mandatory in the medical school curriculum, and preferred to establish research skills earlier in their career. The knowledge regarding research is important to understand the basic models in health-related literature that are being studied and to increase broad thinking and communication skills and also to combat the professional competency in their specialties in the future. To up bring the knowledge on research, conducting a hands-on training course on research methodology, organizing research workshops, frequent research presentations, and journal clubs to provide knowledge and skills needed to implement the scientific research would be useful. We hope that the findings of the study along with recommendations would foster the curriculum development at GMC, Nagpur and other medical schools that are working to improve and strengthen students' research activities and change the face of medical education in India in the long run.

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