

Medical Education

Perception, awareness and practice of research-oriented medical education among undergraduate students of a medical college in Kolkata, West Bengal

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ABSTRACT

Background. The addition of research-oriented medical education (ROME) to the existing curriculum could promote logical thinking, rapid literature search and a better understanding of research methodology. Creation of research temperament could lead to innovations in healthcare. We assessed the perception, awareness and practice of ROME among undergraduate students.

Methods. We conducted a cross-sectional survey among 234 students of R.G. Kar Medical College, Kolkata selected by the simple random sampling technique. Data were collected using a pre-designed, pre-tested, validated questionnaire by direct interviews.

Results. The mean (SD) perception score was 44.2 (5.03). Students from outside West Bengal ($p=0.05$), women ($p=0.03$) and students whose parents were doctors ($p=0.01$) had significantly higher scores. Students in the second and fourth semesters had a better perception than those in the sixth and eighth semesters. Awareness of research fellowships granted to undergraduate students such as the Indian Council of Medical Research–Short-term studentship (ICMR-STS) was low among the second semester students (13.9%), but more than half (59.3%) of the students in the eighth semester were aware (difference across semesters, $p<0.001$). Awareness about journals, conferences and ‘research bodies promoting student research’ was low. Students in the senior semesters spent more time on research (6th semester 72.2% and 8th semester 88.9%) than those in the junior semesters (2nd: 66.7% and 4th: 77.8%; difference across semesters, $p=0.03$). About 3% of students participated in extracurricular research and/or had presented work at a conference.

Conclusion. There is a good perception about the need for research but a lack of awareness of the why and how, as well as hardly any practice of ROME among medical students of this medical college.

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INTRODUCTION

The current status of medical research in India is far from satisfactory as evidenced by the low output of high-quality research.^{1–3} Studies have shown that research experience at the undergraduate level correlates with research involvement at the postgraduate level.^{4–6} Thus, the introduction of ‘research-oriented medical education’ (ROME) in the formative undergraduate years may be useful.^{7–9} The purpose of ROME is to orient a student to think independently, search literature quickly and understand research methodology. This will expose students to evidence-based medicine early in their medical careers. ROME can also act as a stress buster and foster self-directed learning and communication skills.¹⁰ Undergraduate medical research in India is practically non-existent. The short-term studentship (STS) programme sponsored by the Indian Council of Medical Research (ICMR-STS) is the only opportunity to pursue independent research work by an undergraduate student.^{11,12}

The Medical Council of India (MCI) has emphasized the importance of undergraduate medical research and advocated introduction of electives in various topics including research methodology in its Vision-2015.¹³ Therefore, it is useful to understand the present status of research at the undergraduate level in different parts of India. Although some studies have been done from the southern and northern parts of India,^{14–16} there is paucity of data from eastern India. We did a study to assess the perception, awareness and practice of ROME among undergraduate students in Kolkata, West Bengal.

METHODS

A cross-sectional survey was done between August and September 2013 among purposively selected MBBS students of R.G. Kar Medical College, Kolkata. During the study period the 2nd, 4th, 6th and 8th semesters had 200, 150, 150 and 150 students, respectively (i.e. a total of 650 students). The sample size was 360 considering a 99.99% CI, 7% prevalence of research among undergraduate students¹⁶ and an alpha error of 5%. After correction for a finite population, the sample size was calculated to be 234. Considering the semesters as strata, the students were selected by stratified random sampling using the sampling proportional to population size (PPS) principle. Thus, 31%, 23%, 23% and 23% of the entire sample, i.e. 72, 54, 54 and 54 students were chosen by simple random sampling from the 2nd, 4th, 6th and 8th semesters, respectively. The attendance register of each semester was used as the sampling frame.

An anonymous self-completed questionnaire containing 29 items divided in four sections was designed and 10 professors who were considered subject experts validated its content. After incorporating their feedback, the questionnaire was pre-tested on 20 students (5 from each semester chosen randomly) and the

questions were restructured. The subject experts were consulted again. The questionnaire had a mix of open- and close-ended, single- and multiple-response questions. The 5-point Likert scale was used to assess perception of students in 12 questions; these were scored with a maximum possible score of 60.

After obtaining approval of the ICMR and the institutional ethics committee of R.G. Kar Medical College, data were collected by a classroom survey. After obtaining informed consent of the students, the questionnaires were administered. For students who were absent another classroom attempt was made, and those who still remained were contacted after a telephonic appointment.

Mean, median, standard deviation, simple proportion, etc. were calculated for descriptive statistics. Statistical inference was drawn using chi-squared test, odds ratio (OR) with 95% confidence interval (CI), Kruskal–Wallis and Mann–Whitney test, etc. The data were analysed using SPSS version 16. A value of $p \leq 0.05$ was considered significant.

RESULTS

The students were predominantly men (66.7%) and residents of urban (73.4%) areas. The majority completed class XII from the state board with English as the medium of instruction. (Table I).

The maximum score obtained on the 12 perception questions was 59 (of a maximum of 60) with a median of 45 and mean (SD) of 44.2 (5.03). There was no significant difference among students

TABLE I. Demographic profile of the participants

Attribute	Category (%)		
Gender	Men 66.7	Women 33.3	
State of origin	West Bengal 87.6	Others 12.4	
Residence	Rural 26.7	Urban 73.4	
Parents' occupation	Doctor 13.7	Others 86.3	
Board from which passed 10+2	ISC 12.8	CBSE 27.8	State 59.4
Medium in which students studied till 10+2	English 56.8	Bengali 41.0	Hindi 2.1

ISC Indian School Certificate CBSE Central Board of Secondary Education

in different semesters ($p=0.1$). The overall score for the perception questions was higher in the two junior semesters (2nd and 4th) together compared with the senior two (6th and 8th) together ($p=0.028$; Table II).

Women, those from states other than West Bengal and students whose parents were doctors had a positive association with the perception score of ROME ($p=0.03, 0.05$ and 0.01 , respectively).

Responses to 'Research experience in undergraduate days improves one's curriculum vitae' and 'Research stimulates critical thinking and helps in improvement of clinical skills and thereby the healthcare system' varied significantly across semesters ($p=0.002$ and $p<0.001$). The differences in perception score were significant when comparing the lower two and the upper two semesters together ($p<0.0001$). Awareness of government-sponsored fellowship or studentship for undergraduate students doing a biomedical research project was low in the junior semesters and higher among the senior semesters (Table III $p<0.0001$) largely contributed by students of the 8th semester. Awareness about students' organizations such as Indian Medical Students' Association (IMSA) or Indian Forum for Medical Student Research (INFORMER) or similar organizations that hold conferences to enable presentation of undergraduate students' research as well as journals that promote scholarly writing by medical students was negligible (Table III).

The practice of ROME was non-existent. Three-fourth of students (75.2%) said 'No time was spared for research' (significant difference across semesters, $p=0.02$; Table IV).

Similarly, research-related achievements were found to be poor. Only 6 (2.6%) students had participated in extracurricular research work (1, 2, 1 and 2 each from the 2nd, 4th, 6th and 8th semesters, respectively), none was awarded the ICMR-STC or other fellowships, only 1 student from the 2nd semester had presented her work in a conference but none had attempted to publish.

DISCUSSION

Our study shows a positive perception, low level of awareness and negligible practice of research among undergraduate medical

TABLE II. Student's views regarding research-oriented medical education (ROME) (n=234)

Question/issue	Responses (%)		
	Favourable*	Neutral	Unfavourable*
Every clinician should undertake research in their daily pursuit	69.7	25.2	5.1
Doctors who spend some time in research earn greater respect from their peers than those who do not	55.1	22.2	22.7
Clinician–scientists enjoy greater respect in society than clinicians not involved in research	52.1	20.5	27.4
Financial prospects of a research career in medicine are good in India	20.9	31.2	47.9
Inclusion of short-term research project in the undergraduate curriculum will enrich medical education	79.5	11.1	9.4
Undergraduate students should not take part in extracurricular research projects as it will affect their mainstream courses	59.4	16.7	23.9
Research experience in undergraduate days improves one's curriculum vitae	82.1	13.7	4.3
Research stimulates critical thinking and helps in improvement of clinical skills and thereby the healthcare system	80.3	12.4	7.3
For an undergraduate student support and guidance from teachers and family are important to do a research project	88.5	8.1	3.4
Lack of time due to the large MBBS syllabus is a hindrance to do research	81.2	10.7	8.1
Lack of institutional and financial support for undergraduate research is a limiting factor for projects being done by medical students	77.4	17.9	4.7
Lack of conception and self-motivation among students are major drawbacks for an undergraduate student undertaking a research project	63.7	18.8	17.5

* Favourable includes responses strongly agree and agree; unfavourable includes responses disagree and strongly disagree

TABLE III. Students' awareness of facilities for undergraduate medical research in India

Question	Awareness of students in different semesters (%)				
	2nd (n=72)	4th (n=54)	6th (n=54)	8th (n=54)	Total (n=234)
Do you know of any government-sponsored fellowship such as ICMR-STC or others?	13.9	20.4	25.9	59.3	28.6
Do you know about organizations arranging student conferences?	0	5.6	1.9	5.6	3.0
Do you know about journals promoting scholarly writings by undergraduate students?	1.4	3.7	9.3	1.9	3.9

ICMR-STC Indian Council of Medical Research short-term studentship

TABLE IV. Students' research-related activities

Practice	Proportion of students in different semesters (%)				
	2nd (n=72)	4th (n=54)	6th (n=54)	8th (n=54)	Total (n=234)
No time spent for research	66.7	77.8	72.2	88.9	75.6
Access to peer-reviewed journals	0	3.7	3.7	5.6	3.0
Experience in writing a research protocol	3.7	11.1	13.0	11.1	9.0

students at a medical college in Kolkata, West Bengal. We found that girls had a better perception than boys, which is contrary to a study from Pakistan reporting a better attitude among boys.¹⁷ Although a cohort study found male preponderance in a research career,¹⁸ a study from Kasturba Medical College, Mangalore found no significant difference across genders in the preference for a research career.¹⁴ This could be because, at present, more girls are joining medicine and tend to prefer a pre- or paraclinical career. Students whose parents were doctors also had a better perception score. This might be because they had personalized guidance regarding research. A negative attitude with advancing semesters on various issues such as 'research provokes critical thinking', 'inclusion of short-term research project in undergraduate curriculum will enrich the status of medical education' were the odd findings of our study. These are in contrast to the observations made in a study from Aga Khan University, Pakistan, which found that knowledge and attitude towards health research increased as students advanced in the course.¹⁷ It might be attributable to the satisfactory contribution of medical curriculum in developing research skills through well-structured intensive training which was definitely deficient in our setting and resulted in a diminishing perception with increasing years of education at medical school. Awareness about opportunities for undergraduate medical research was low among our participants. In contrast, a study of 4th and 6th semester students at the University College of Medical Sciences, Delhi found that 47% of students were aware of the ICMR-STC programme.¹⁵ The reason behind the low level of awareness about opportunities and facilities for undergraduate medical research cannot be explained by the non-availability of internet to medical students as a study from another college of West Bengal shows that medical students used the internet extensively as a ready source of information.¹⁹ There was negligible involvement of students in research and it was significantly lower than that reported by other studies.²⁰ This could be because of the absence of any motivation for students to take up research—no mentor, no research forum and no discussion groups. A study from Manipal found that the introduction of a formal Mentored Student Project programme was successful in fostering research skills, critical thinking and positive attitude towards research.²¹

Our study has limited generalizability as it was done in one

medical college in West Bengal and hence may not represent the prevalent scenario in the State or in eastern India. It is likely that the scenario in medical colleges in smaller cities or in more remote locations could be worse. However, the study does inform us the dismal scenario of involvement of undergraduate students in research activities.

ROME means much more than doing original research studies in a community or laboratory. If blended with day-to-day learning, it may range from searching new evidence to updating one's knowledge or seeking answers on the web to a particular question which bothers a student while going through the textbooks or writing a simple article (e.g. a letter to editor requiring a search of the available literature), which improves critical thinking, reasoning and writing skills. The reason behind the minuscule or no time spared for research is not only the lack of facilities, proper mentors or formal pathway to choose research as carrier option but also the rigid memory-based unidirectional medical education system currently prevailing in India. Experts have said that our existing medical system is 'overburdened, perpetually short of resources and dictated by existing rigid curricula'.²² However, the good perception could be the fertile soil in which the seed of research can be planted and carefully nurtured.

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