DOI: 10.7860/JCDR/2017/29318.10972

Original Article

Education Section

Aptitude of Medical Research in Undergraduate Students of a Medical University - Miles to go Before we Sow

SIMRAN KAUR BAINS[1], PREETHA JOHN[2], DHANUSHREE NAIR[3], SOURYA ACHARYA[4], SAMARTH SHUKLA[5], NEEMA ACHARYA[6]

ABSTRACT

Introduction: In the era of modern medicine, research is a fundamental tool to study the natural behaviour of diseases and evidence based management of patients. Excluding a few developed countries, research is still a neglected field. India, being one of the most populated countries, is still behind when it comes to producing and publishing standard medical research publications.

Aim: To evaluate the aptitude of research in undergraduate students of a medical university.

Materials and Methods: A cross-sectional study was done with a validated questionnaire containing 12 objective questions to evaluate the current scenario of research amongst undergraduate students. The questionnaire was validated by the School for Health Professionals Education and Research (SHPER) of the university. It was distributed among 510 students from the dental and medical colleges of the Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra, India. The feedback data was collected and analysed using descriptive statistical analysis.

Results: From the medical and dental colleges of the university, 510 students were surveyed. Four hundred and twenty students (82.35%) were aware of clinical research, out of which only 99 students (19.41%), actually participated in research. Thirteen students (13.13%) participated in research to better their chances of career abroad. Hectic schedule was seen as the foremost hindrance amongst 227 students (55.23%). Around 398 students (78.03%) sense research to be an important part of the curriculum. Around 430 students (84.31%) think that research should be taught as a part of the curriculum and 253 students (49.60%) wanted to pursue research as a career.

Conclusion: Change can be brought about in the present scenario of contribution to research by undergraduate students from India on a global scale by making research a part of the curriculum and providing incentives to students.

Keywords: Academic, Barriers, Curriculum, Incentives, Opportunities

INTRODUCTION

Research is a systematic investigation which includes, research development, hypothesis testing and evaluation, that contributes to generalisable knowledge. Research can be categorized into different forms like biomedical research, epidemiological studies, and health services research. It also encompasses the behavioural, social, and economic factors that affect health [1]. Clinical research is essential as it applies itself directly into the human condition and thus, brings about rapid change in the practice of medicine. The bulk advancements in technology are enabling transformation in health research information that can be exchanged with much ease. With resources like these, it is expected that a health care professional be skilled enough to apply findings from clinical research so as to adopt the best available interventions to improve health and health care for individuals and populations.

According to a scientometric analysis, India contributes to 28% of the world's total years lost to respiratory infections, 25% of the years lost to tuberculosis, 24% of the years lost to diarrhoeal diseases, and 45% of the years lost to leprosy. In addition, 2.5 million people in India are living with Human Immunodeficiency Virus / Acquired Immune Deficiency Syndrome (HIV/AIDS) [2].

Being a country that shoulders a large amount of diseases in the world [3], India spends only 0.82% of its Gross Domestic Product (GDP) on research and development compared to a 2.69% by the United States of America, 2.87% by Germany and a total of 3.34% by Japan - a country with less GDP growth than India [4]. If a comparison is done between the number of papers published in internationally recognized journals, India has a total of 293,049 papers between 1999-2008 whereas, developed countries like USA has 3,049,662, Germany has 265,134 and Japan has 771,548 papers published [2]. Just as the economic indices indicate the financial status of a country, the statistics on scientific publications indicate the academic temper.

Amongst the medical institutions in India, All India Institute of Medical Science (AIIMS), New Delhi produces the maximum publications followed by Postgraduate Institute of Medical Education and Research, Chandigarh and Christian Medical College, Vellore. This is in contrast to the 332 of the total 572 medical colleges in India that have not produced any paper [5].

Aptitude for medical research will have more of an impact if developed at an earlier stage. Building skills in scientific reasoning and critical thinking among the medical students is an important part of this profession. Medical research at undergraduate level can help the students hone their skills and thereby, inculcate the habit of enquiry irrespective of whether the participants ultimately engage in community practice, become clinicians or full time researchers. The purpose is to enhance the medical knowledge and apply it to patient care. India will have to develop a strong base for clinical research. This can be done by inculcating medical research into the curriculum at the undergraduate level.

Fair number of undergraduate students have shown research interest and aptitude. The popularity of the Short Term Studentship (STS) program of the Indian Council of Medical Research (ICMR) has proven it time and again. Any undergraduate starting from the first semester of MBBS can apply for the research; they select a topic and a guide; make a synopsis of the project and submit it to ICMR. Then the ICMR, after scrutiny, selects the projects and the

results of accepted projects are declared. The selected students then undertake research for two months and receive a token amount and a certificate on submission of a project report. However, the students whose projects are not selected discontinue the research [6].

Kishore Vaigyanik Protsahan Yojana (KVPY) conducted by the Indian Institute of Science is a programme for promoting research at the undergraduate level. The KVPY program assists students to realise their potential and ensures that talented scholars with capability to do good quality research are honed and encouraged. Generous scholarship and contingency grant is provided to the selected students for completion of their projects. The program runs concurrent with the medical studies and does not prolong the duration of the medical course [6].

Another certificate program in research methodology held by the Public Health Foundation of India, 'The Khorana Program for Scholars' conducted by Department of Biotechnology under the Indo-US Science and Technology Forum, is not applicable for medical undergraduates [7]. Innovation in Science Pursuit for Inspired Research (INSPIRE) by the Department of Science and Technology and National Institute Of Health (NIH) sponsored training in health is another forum available for research [8]. Research by St. John's Research Institute is also an example of research program in the field of medicine. These programs, however, are only applicable to graduate students.

We conducted this study with the objective of assessing aptitude for research in undergraduate students, to find out the basic hurdles they face, and to suggest possible solutions that can improve the interest of research in undergraduate students.

MATERIALS AND METHODS

This cross-sectional study was conducted in the medical and dental college of Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra. A questionnaire based survey was conducted after obtaining permission from the Institutional Ethical Committee. The study was carried out from February 2017 to April 2017. A questionnaire containing 12 objective questions was formulated to evaluate the current scenario of research amongst undergraduate students (ANNEXURE 1). This was validated by experts in educational research from SHPER of the university. The questionnaire was then applied on a pilot group of 25 students, following which necessary modifications were made to it. The students of first to final year of both the colleges who were present on the day of distribution of the questionnaire were included in the study. They were given a total of 15 minutes to answer the questions. Postgraduates and those who did not consent were excluded. A descriptive statistical analysis was done on the data collected.

RESULTS

Out of 900 students enrolled over the academic years of 2013 to 2016 into the medical and dental colleges of the university, 510 students responded. The baseline data is represented in [Table/Fig-1]. Undergraduate medical and dental students of the university who consented were included in the study. The questionnaire given to students contained multiple choice questions where multiple answers were permitted for some questions.

The initial question was framed to know how mindful the participants of the study were of 'research in clinical medicine' and it was seen that 82.35% of participants were aware of it.

Details about the reasons for participating and not participating in research activity is summarised in the [Table/Fig-2,3]. Four hundred and one students (78.62%) were aware of bodies that promote research in undergraduate level. Eighty five participants (16.66%) attempted to do a STS research. Four hundred thirty seven (85.68%) knew about the grant provided by the university but only

	MBBS				BDS
Semester	Third	Fifth	Seventh	Nineth	Eighth
No. of Students	95	138	114	89	74
Age (years)	18-19	19-20	20-21	21-22	21-22
Sex(F:M)	53:42	75:63	56:58	48:41	50:24

[Table/Fig-1]: Baseline data of participants who responded on the day of distribution of questionnaire.

Reason for not participating in research activity	Number of subjects (out of 411)
Not interested in research.	78 (18.98%)
Lack of time due to hectic schedule.	227 (55.23%)
Necessary facilities are not available.	10 (2.43%)
Difficulty in finding a guide.	61 (14.84%)
Not a compulsory part of curriculum.	35 (8.51%)

[Table/Fig-2]: Distribution of subjects according to reason for not participating in research activity amongst the subjects who never participated in research activity.

Reason for Participation in research activity	Number of subjects (out of 99)
To contribute to the medical field.	44 (44.44%)
Interested in building a research based career.	28 (28.28%)
Interested in building a career abroad, where previous experience in the research field is mandatory.	13 (13.13%)
An added credit while applying for higher studies in prestigious institutions.	26 (26.26%)

[Table/Fig-3]: Distribution of subjects according to reason for participation in research activity (multiple answers were permitted).

259 (50.78%) knew how to avail it. Four hundred and eight (80%) students knew about the research lab in the university.

When the students were asked if they considered research to be an important part of their curriculum, 21.97% of them said 'no' and 78.03% of them perceived it to be an essential part of the medical curriculum.

The participants of this study were asked about their involvement with bodies like ICMR that provide a national platform for undergraduate students to involve in research activity— and it was found that only 16.66% made use of ICMR STS. Apart from the problems discussed earlier, the procedure being cumbersome (11.35%) was an added issue that prevented students from taking up STS under ICMR. When the abstract was not accepted, 66.83% did not proceed with their research as most of them were not aware that they could continue the research after being rejected (50%) and many others (40%) were not interested to complete it without acceptance by ICMR.

When they were asked if the knowledge to carry out research was being imparted via the curriculum, 59.80% responded positively. Four hundred and thirty out of the 510 subjects think that research should be taught as a part of the curriculum in the form of workshops. The questionnaire was concluded by asking the subjects if they were drawn towards taking up clinical research as their career to which 49.60% answered 'Yes'.

DISCUSSION

Data from Index Medicus indicates that, in 1998, globally 416,561 research articles were published of which India's contribution was only 0.714% (2974 articles) [9]. A large number of medical colleges do not even publish a single paper in a year. Possible reasons for this baffling statistics may be;

1. Lack of the minimum infrastructure in most of the medical colleges of our country. There is lack of the basic requirements like manpower and funding.
2. Lack of incorporating research methodology in the current undergraduate curriculum, leading to a persistent dissociation between the students and their interest towards research.
3. Lack of confident and trained faculty to guide the students [6,9].

Though, till date several committees have been appointed to advise the government on the formulation of a National Health Policy including manpower development, it's ironic that no committee/ commission has addressed the issues of the poor state of medical research in India [6,10]. Stalwarts who feel this gap as a major hindrance in cultivating research atmosphere are taking initiative privately to address these issues. One such initiative is the, Undergraduate Medical Students Research Conferences, under the banner of the Moving Academy of Medicine and Biomedicine which was held in October 2006 and February 2008 in Pune. The idea was to nurture exceptional students with research aptitude before it gets lost in the quagmire of commonality [6]. In this study, it was seen that despite having quite a positive attitude of students towards research (82.35%), the outputs i.e. percentage of research completed amongst participants, were low (17.64%). Our results coincide with a study conducted in Saudi Arabia, where 520 students from five medical colleges were included and the study concluded that only 43.9% of students had a positive attitude towards research [11]. On evaluation it was discovered that; this paucity of research aptitude was due to inadequate research resources, time constrains and lack of mentorship. These are the barriers that are seen most frequently, not just in this study but also in similar studies conducted by Osman T, Jeelani et al., and Mark A Dsouza et al., [12-14].

During the training period, the students were over burdened with the work load of exams, practicals, ward duties and tutorials. In such a situation, grades are seen to become the top priority and very few of them think about research. This argument is reinforced by Henzi D et al., [15]. This study showed that lack of interest (18.98%) and research not being a compulsory part of the curriculum (8.51%) are also reasons for reduced participation. A study conducted in Shiraz University, Iran shows that appreciation in terms of certificates, marks or scholarships can go a long way in encouraging students to pursue research [16]. Time constraints to perform research in medical colleges seem to be an universal issue, so this problem should be categorically tackled by incorporating research in the curriculum semester wise, so that each student can at least be oriented with the nuances of medical research without getting burdened, because once in curriculum, it becomes a felt need to learn about research. Then, definitely, interested students will come forward and grab opportunities to do research. There have been several studies indicating that including research in the curriculum, whether short-term or a standardised, makes the medical student more confident about a research carrier [17,18]. At Stanford and Duke, research is an integral part of their curriculum where students can either conduct research during a dedicated year or during longitudinal experience spanning several years [19]. Similar programs were conducted at University of Reading and University of Auckland [20,21]. These programs solve the issue of time constraints and adds credit. This study shows that 84.65% of the subjects consider that workshops or more hands-on methods must be implemented in place of the theoretic methods used to teach them about research methodologies. A Compulsory Practical Training Research Workshop (CPTRW) in every specialty could be implemented by the government [22]. A study in Albert Einstein Medical College revealed how medical research increases a student's ability to critically evaluate literature, work independently, improve their ability to evaluate their strengths and weaknesses and improve data skills [23]. A study conducted in Germany evaluated the contribution of medical students in research publications in medline indexed journals. It showed that, 28% of the papers were authored by medical students. For 66% of medical students their research resulted in a Medline indexed publication, suggesting that; medical student research activity can significantly influence the published output of a medical faculty [24]. Such positive benefits of research must be advertised, so that the desire to do research is ingrained into the young minds.

It is mandatory to organize more number of regional level conferences, where every student with research aptitude will get an opportunity to present and discuss his/her work at a common forum. Medical universities, colleges, health authorities of states should come forward to take up such initiatives. Best performers should be encouraged to present their work in larger platforms both nationally and internationally and all necessary funding should be provided to the student. By voluntarily joining such programs, these students will show a special aptitude for research replacing the age old negative idea that young medical undergraduates are not interested in research. Student's performance will get enriched considerably, if they undergo short-term training in basic research methodologies. In USA, NIH has two major training programs for medical students. Medical Scientist Training Program (MSTP), that offers the combined MD-PhD degree, was launched in a few medical schools in the mid sixties with the basic objective to train the medical graduates in both biomedical sciences and clinical research. The program is now successfully running in more than 100 medical schools. Some 600 MDs (4%) enrollees opt for MD-PhD program and this number has remained more or less steady for the last 20 years. Similar programmes should be initiated for undergraduates in our country [25]. To improve the performance of the STS researches, it is necessary to conduct short duration two to three days workshops on research methodology including biostatistics and ethics. Depending on the project undertaken the recipient should also be exposed to techniques that would be used in the investigation.

History of medical research boasts landmark contributions from medical students like the names of; 22 year old German medical student, Paul Langerhans, in 1869 for his work on Islets of Langerhans, Charles H. Best for his pivotal role in the discovery of insulin when he was a student which fetched the 1923 Nobel prize in Physiology and Medicine to his mentor Dr. Banting. To make the landmark discovery more dramatic, Banting shared, publicly, 50% of the prize money with his student [6].

Medical students are time and again, made to realize the importance they have in the society as 'life-savers'. This picture is usually restricted to responsible decisions made in bustling hospitals. The impact that researchers have on millions of lives spanning over generations is often disregarded as the effect is not immediate in nature. A substantial difference can only be brought about by altering the mindset at the grass-root level by giving paramount importance to clinical research. Obviously, given the proper environment [Table/Fig-4] students could contribute in a major way to scientific research.

The pillars of development of research culture in medical students						
Infiltration of research methodology in curriculum/ developing sense of 'felt need' for research. ADAPTING "SPICES"Model (Student centred, Problem based, Integrated, Community based, Electives and Systemic model [26].	Publishing student research journal [27].	Publicising existing STS. Programmes.	Funding credits and incentives for successful completion of projects.	Developing student research guid ance clinics.	Strong trained faculty for dynamic mentorship.	Near Peer Role Modeling (NPRM). Peer role models to come forward for active guidance [28].

[Table/Fig-4]: Showing a comprehensive approach that can improve the research interest and culture in medical undergraduates in India.

LIMITATION

The limitation of our study is that it includes students of one university only, the result might vary when applied to a larger sample size.

CONCLUSION

After conducting the study we come to the conclusion that though a large number of students were aware of research, only a few of them have been successful in actually conducting a research study. The lack of participation may be attributed to the hectic schedules of medical students, inadequate support from the faculty and an overall attitude of unimportance towards research. In a nutshell, if we want to reap authentic results, as far as research in medical science is concerned, it is high time we consciously 'sow' the seeds of discipline, interest, positive aptitude, good mentorship and ultimately awaken the research culture by changing the curricular system. These changes must be brought about effectively so that in the long run, India yields a rich harvest in the field of research for as we sow, so we reap!

ACKNOWLEDGEMENTS

We would like to extend our gratitude to Dr. A. Rawekar, HOD, Department of Physiology for her invaluable guidance, the statistician of the university, Dr. V. Babar, Department of Preventive and Social Medicine, SHPER for validating the questionnaire and finally to the students who participated in the study.

REFERENCES

[1] Nass SJ, Levit LA, Gostin LO. Institute of Medicine (US) Committee on Health Research and the Privacy of Health Information: the HIPAA privacy rule. Beyond the HIPAA privacy rule: enhancing privacy, improving health through research. Washington (DC): National Academies Press (US); 2009.
[2] Gupta BM, Bala A. A scientometric analysis of Indian research output in medicine during 1999-2008. J Nat Sci Biol Med. 2011;2(1):87-100.
[3] Murray CJL, Lopez AD. The Global Burden of Disease. Boston: Harvard University Press; 1996.
[4] Available from: https://tcdata360.worldbank.org/indicators/GB.XPD.RSDV.GD.ZS?country=IND&indicator=2013&viz=line_chart&years=1996,2014.
[5] Ray S, Shah I, Nundy S. The research output from Indian medical institutions between 2005 and 2014. Curr Med Res Pract. 2016;6(2):49-58.
[6] Deo MG. Undergraduate medical students' research in India. J Postgrad Med. 2008;54(3):176-79.
[7] Khorana Program; Promoting Scientific Cooperation between India and the United States. Available from: www.biochem.wisc.edu/faculty/ansari/khorana_program/
[8] Innovation in Science Pursuit for Inspired Research (INSPIRE). Ministry of Science and technology. Available from: www.inspire-dst.gov.in/. [Accessed on Feb 10, 2017].
[9] Satyanarayana K. National Mapping of Science. India: Biomedical Sciences, Indian Council of Medical Research. 2000;19(1):17-21.
[10] The National Institute of Health and Family Welfare. Available from: http://www.nihfw.org. [Accessed on Dec 18, 2017].
[11] Al-Hilali SM, Al-Kahtani E, Zaman B, Khandekar R, Al-Shahri A, Edward DP. Attitudes of saudi Arabian undergraduate medical students towards health research. Sultan Qaboos University Medical Journal. 2016;16(1):e68-e73.
[12] Osman T. Medical students' perceptions towards research at a Sudanese University. BMC Med Educ. 2016;16(1):253.
[13] Jeelani W, Aslam SM, Shah I, Ahmed U, Khokhar M, Bhatti MA. Medical and dental research at undergraduate level: evaluation of opportunities and barriers. Pak Armed Forces Med J (Category X). 2012;63(4):573-77.
[14] Dsouza MA, Balakrishnan T, Vora M, Pereira BM, Palkar D, Zaman B, et al. The attitude of undergraduate medical students towards research: a case study from two medical colleges in Maharashtra, India. Current Science. 2017;113(6):1129-33.
[15] Henzi D, Davis E, Jasinevicius R, Hendricson W. In the students' own words: what are the strengths and weaknesses of the dental school curriculum? J Dent Educ. 2007;71(5):632-45.
[16] Mowla A, Nabavizadeh SA, Bajestan MN, Tavakoli A, Seifi A, Tavakoli A. Payment as motivator in Iranian medical students' attitudes toward research. Southern Medical Journal. 2016;99(12):1403.
[17] Houlden RL, Raja JB, Collier CP, Clark AF, Waugh JM, Medical students' perceptions of an undergraduate research elective. Med Teach. 2004;26(7):659-61.
[18] Hren D, Lukić IK, Marusić A, Vodopivec I, Vujaklija A, Hrabak M, et al. Teaching research methodology in medical schools: students' attitudes towards and knowledge about science. Med Educ. 2004;38(1):81-86.
[19] Laskowitz DT, Drucker RP, Parsonnet J, Cross PC, Gesundheit N. Engaging students in dedicated research and scholarship during medical school: The long-term experiences at Duke and Stanford. Academic Medicine. 2010;85(3):419-28.
[20] Burgoyne LN, O'Flynn S, Boylan GB. Undergraduate medical research: the student perspective. Medical Education Online. 2010;10:15.
[21] Park SJ, McGhee CN, Sherwin T. Medical students' attitudes towards research and a career in research: An Auckland, New Zealand study. The New Zealand Medical Journal. 2010;123(1323):34-42.
[22] Kumar N, Singh S, Pal R, Kumar R. Lack of research aptitude in medical education. Int J Basic Clin Pharmacol. 2014;3(1):247-48.
[23] Frishman WH. Student research projects and theses: should they be a requirement for medical school graduation? Heart Dis. 2000;3(3):140-44.
[24] Cursiefen C, Altunbas A. Contribution of medical student research to the Medline-indexed publications of a German medical faculty. Med Educ. 1998;32(4):439-40.
[25] Ley TJ, Rosenberg LE. The physician-scientist career pipeline in 2005. Build it and they will come. JAMA. 2005;294(11):1343-51.
[26] Singh S. Near peer role modeling: The fledging scholars' education paradigm. Anat Sci Educ. 2010;3(1):50-51.
[27] Sibbald B. New student medical journal launched. CMAJ. 2009;181(8):E167.
[28] Harden RM, Snowden S, Dunn WR. Educational Strategies in curriculum development: the SPICES model. Med Educ. 1984;18(4):284-97.

PARTICULARS OF CONTRIBUTORS:
1. Student, Department of Medicine, Jawaharlal Nehru Medical College/Datta Meghe Institute of Medical Science, Wardha, Maharashtra, India.
2. Student, Department of Medicine, Jawaharlal Nehru Medical College/Datta Meghe Institute of Medical Science, Wardha, Maharashtra, India.
3. Student, Department of Medicine, Jawaharlal Nehru Medical College/Datta Meghe Institute of Medical Science, Wardha, Maharashtra, India.
4. Professor, Department of Medicine, Jawaharlal Nehru Medical College/Datta Meghe Institute of Medical Science, Wardha, Maharashtra, India.
5. Professor, Department of Pathology, Jawaharlal Nehru Medical College/Datta Meghe Institute of Medical Science, Wardha, Maharashtra, India.
6. Professor, Department of Obstetrics and Gynaecology, Jawaharlal Nehru Medical College/Datta Meghe Institute of Medical Science, Wardha, Maharashtra, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Sourya Acharya,
Professor, Department of Medicine, Acharya Vinoba Bhave Rural Hospital, Sawangi (M), Wardha, Maharashtra, India.
E-mail: souryaacharya74@yahoo.com

FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Apr 14, 2017**
Date of Peer Review: **May 29, 2017**
Date of Acceptance: **Nov 08, 2017**
Date of Publishing: **Dec 01, 2017**

ANNEXURE 1

Questionnaire

1. Are you aware of research in clinical medicine?
   - o Yes
   - o No
2. Have you ever participated in research activity?
   - o Yes
   - o No

   If yes, Why?
   - o To contribute to the medical field
   - o Interested in building a research based career
   - o Interested in building a career abroad, where previous experience in the research field is mandatory
   - o An added credit while applying for higher studies in prestigious institutions If no, Why?
   - o Not interested in research
   - o Lack of time due to hectic schedule
   - o Necessary facilities are not available
   - o Difficulty in finding a guide
   - o Not a compulsory part of curriculum
3. Are you aware of bodies that promote research in the undergraduate level (E.g: ICMR - STS)
   - o Yes
   - o No
4. Have you attempted to do a Short Term Studentship research?
   - o Yes
   - o No

   If no, Why?
   - o The procedure is too lengthy/complicated
   - o Lack confidence after rejection of prior application(s)
   - o Not interested in research
   - o Lack of time due to hectic schedule
   - o Necessary facilities are not available
   - o Difficulty in finding a guide
   - o Not a compulsory part of curriculum

   If yes, was your abstract accepted for the grant?
   - o Yes
   - o No
5. In case your abstract was not selected, did you proceed/ consider proceeding with your research anyway?
   - o Yes
   - o No

   If no, Why?
   - o Not interested to complete it without acceptance by ICMR
   - o Guide was not interested in completing the research
   - o Did not know that one could complete the research even if it was not selected.
6. Does your university provide any grant for undergraduate research projects?
   - o Yes
   - o No
7. Do you know who has to be contacted to avail the above mentioned grants?
   - o Yes
   - o No
8. Is there a research lab in your university?
   - o Yes
   - o No
9. As an undergraduate student, do you consider research to be an important part of your curriculum?
   - o Yes
   - o No
10. Do you think adequate knowledge to carry out research is imparted through the curriculum?
    - o Yes
    - o No
11. Do you think research methodologies should be taught as a part of the curriculum, in the form of workshops?
    - o Yes
    - o No
12. Would you consider taking up clinical research as your career?
    - o Yes
    - o No