



# The Outlook and Assessment of Biomedical Research among the Medical and Dental Students – A Cross Sectional Study in Odisha, Eastern India

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## ABSTRACT

**Objective:** This study was conducted to overview the determination of medical and dental students towards the academic curriculum, research interest and career outlook. From the previous studies the survey questions are collected basing on the medical and dental student's attitudes toward research and their interest towards course curriculum.

**Methodology:** In a Google Form version, the questions were developed and modified to complete the study. For statistical analysis Social Science (SPSS) program, Statistical Package version 16 was used for data analysis. Mean± standard deviation was used to report numerical variables.

**Result:** It was found that 37.9 percent would do research to improve their clinical knowledge, 25.5 percent were really interested to carry out research, 20.6 percent would do research with a motive to provide better health care facilities, 7.6 percent to improve their resume, 4.1 percent to get recognition, 4.1 percent to learn new things where as four individuals were not at all interested to do the research.

**Conclusion:** Medical and Dental colleges should include subjects like research methodology in their course curriculum and should provide research infrastructures as well as skilled supervisors in order to motivate and encourage the students for active participation in research.

**Key words:** Health Science, Research Interest, Medical Students, Academic Curriculum

## INTRODUCTION

Research is the practice of human interpretation, investigation and revision based on different aspect of human knowledge around the world.<sup>1</sup> Health Science and Research training has been recognized as one of the important component of medical education due to the rapid expansion and progress in the field of biomedical research which is expected to transform medical care system.<sup>2</sup> The physicians and investiga-

tors play a major role by translating the progress of basic science into clinical practice which defines physiological and pathological implications at the molecular level by designing, directing and evaluating new therapies based on basic scientific discoveries.<sup>3,4,5</sup> The recent advances in the field of medicine and science, gives new translations to the existing realities to the medical students. However, in developing countries, it's observed that research activates are in a high trend.<sup>1,6</sup>

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Short term student-ship program has been initiated in the year 1979 by ICMR (Council of Medical Research) to encourage the undergraduate medical students as well as to aware them about research methodology and techniques. During this short-term student-ship research programs the students undertake an independent project which enhances their research aptitude and interest.<sup>7</sup> Studies have shown that research experience during medical school is strongly associated with postgraduate research initiatives and future career achievements in academic medicine.<sup>8,9,10</sup> The health care system has led to deterioration in research activities by depriving the medical students from understanding and utilization of latest medical advances.<sup>11</sup>

Health care system in India consists of public and private healthcare facilities and services – both contribute towards medical education, either under directives of the State/Union governments or through private institutional affiliation. Indian medical and dental education has advanced gradually to where it stands today- being the most competitive fields of education, Indian students compete through tough competition in order to secure their future career.<sup>12</sup> Along with different clinical subjects, medical students are required to finish necessary clinical courses within a given number of hours in each clinical subject and are administered to regular clinical and paper-based assessment/evaluations that needs to satisfy clerkships, elective courses - all while managing the anxiety and stress that accompanies with course load completion before the final exams.<sup>13</sup> In this study, we aimed to provide an overview of medical and dental student's determination towards the academic curriculum, research interest and career outlook.

## MATERIALS AND METHODS

A cross-sectional survey conducted on both male and female of first, second, third and fourth year along with internship medical students at the IDS, IMS and SUM Hospital, Odisha, India, from 9<sup>th</sup> to 25<sup>th</sup> September 2020. The Study was approved by Intuitional Ethical Committee of IMS & SUM Hospital with reference number (DMR/IMS/SH/SOA/1592). During the data collection time, India was partial unlocked but all institutions, schools and universities were closed for students. So, our only option was to use student's official records and contacted them over telephone and collected their mail id for enrolling potential participants. By employing a convenience sampling method, we identified all the batches of medical and dental students in the Institutes. The soft copy of the questionnaire link was in Google Form format, which was sent to the enrolled participants via their mail id and identified with approximately 530 students.

**Data collection:** From the previous studies the survey questions are collected basing on the medical and dental student's attitudes toward research and their interest towards course curriculum. In a Google

Form version, the questions were developed and modified to complete the study. 50 number of students were surveyed for a pilot test before forwarding the questionnaire through mail, in order to determine the required time to complete the questionnaire and to estimate the comprehension of the questions by the participants so that it could be refined accordingly. Pilot questionnaires were excluded from the final analysis. The final self-administered questionnaire consisted of 16 questions, which required approximately 5 min to answer.

**Questionnaire Preparation:** An information mail was forwarded along with attached to a Google Form formatted link questionnaire, with a short description of the aim of the study and instructions on how to complete the questionnaire. The questionnaire was subdivided into categories in which the first part included the perceptions of medical and dental students of the importance of research and its impact on their career. The second part highlighted the important obstacles to conducting research. The following section contained questions about practicing research and experiences in this domain. Finally, socio-demographic information of the participating students including age, gender, medical and dental year and residency program of interest was collected.

**Statistical analysis:** For statistical analysis Social Science (SPSS) program, Statical Package version 16 was used for data analysis. Mean± standard deviation was used to report numerical variables. The association among the different categorical variables were assessed by Chi-square test where p-value <0.05 and considered as the statistical significance.

**Inclusion and Exclusion Criteria:** The individual student were 18 years or older and were included in the study after an informed consent was obtained. The unwilling students were excluded in the survey.

## RESULTS

A total of 491 students participated out of 800 in this study. All the students were from IDS, IMS & SUM Hospital. The background characteristics were found that, out of the total participants 55.6% (272) was females and 44.6% (219) were males. Among the participants those included in the study 22.2% (102) were from 1<sup>st</sup> year, 27.5% (135) were from 2<sup>nd</sup> year, 25.9% (127) were from 3<sup>rd</sup> year, 24% (118) from 1<sup>st</sup> year and 0.4% (2) were under internship. It was observed that only six students were of 18 years of age and all of them were ≤ 25 years or less (Table 1).

An observation was made to understand the different perspective of the students for perusing the course and it was observed that 25.5 percent of the students were interested for research (Table 2). The data was collected whether the participants have any doctors as their relatives and if they have any research publication, in order to verify if the participants with doctor as their relatives has any impact on their research interest.

**Table 1: Back ground characteristics**

Variable	Students (%)
<b>Gender</b>	
Male	219 (44.6)
Female	272 (55.6)
<b>Year of MBBS and DS</b>	
1 <sup>st</sup> year	102 (22.2)
2 <sup>nd</sup> year	135 (27.5)
3 <sup>rd</sup> year	127 (25.9)
4 <sup>th</sup> year	118 (24)
Internship	2 (0.4)
<b>Have Doctor relatives</b>	
Yes	276 (56.2)
No	215 (43.8)
<b>Have published papers</b>	
Yes	25 (5.1)
No	466 (94.9)
<b>Age of participants</b>	
18 years	6 (1.2)
19 years	32 (6.5)
20 years	87 (17.8)
21 Years	125 (25.5)
22 Years	105 (21.4)
23 Years	80 (16.3)
24 years	40 (8.2)
25 Years	15 (3.1)

**Table 2: Different perspective of the students interested for perusing the course (N= 491)**

Different perspective	Students (%)
Not interested at all	0 (0)
To improve clinical knowledge	187 (38)
To get recognition	20 (4.1)
To improve their resume	37 (7.6)
Very interested to do research	125 (25.5)
To learn new things	21 (4.2)
To provide better health care facilities	101 (20.6)

**Table 3: Interest to work in the field of research during their under-graduate program**

Variable	Interest to work in research field during UG program		P-value
	Yes (%)	No (%)	
<b>Gender</b>			
Female	217 (79.77)	55 (20.23)	0.05
Male	160 (73.05)	59 (26.95)	
<b>Year of Degree</b>			
1 <sup>st</sup>	87 (79.81)	22 (20.19)	0.591
2 <sup>nd</sup>	107 (79.25)	28 (20.75)	
3 <sup>rd</sup>	96 (75.59)	31 (24.41)	
4 <sup>th</sup>	86 (72.88)	32 (27.12)	
Internship	1 (50)	1 (50)	
<b>Have doctor relatives</b>			
Yes	213 (77.17)	63 (22.83)	0.449
No	164 (76.27)	51 (23.73)	
<b>Have research papers published</b>			
Yes	24(96)	1(4)	0.015
No	353(79.14)	113(20.86)	

UG=Under-graduation

A total of 56.2 percent (276) has doctors as their relatives but only 5.1 percent (215) have research publications (Table 1). The under graduate students' interest to work in research field was significantly associated with the gender and the research publication of the participant (Table 3). It was observed that highest number of female (217) and lowest number of male (160) participants were interested for research work during their under graduate program among which high number (213) have doctors as their relatives whereas only a few (25) of them have published a research article (Table 3). When it was observed in table 3 the participants interested in research field is significantly associated with gender (female =175; male=148), and the year of DS and MBBS (1<sup>st</sup> = 63, 2<sup>nd</sup> = 90, 3<sup>rd</sup> =84, 4<sup>th</sup>=84 and internship =2), but not associated with having a doctor relative or having a previous publication. The interest to pursue research as a career is significantly associated with year of DS and MBBS course (Table 4). It is not associated with gender, having a relative who is a doctor or having a prior published research paper. The perception on most crucial outcome of medical training is significantly associated with having a relative as a doctor. An open-ended question was used to look at the reasons if at all they want to conduct research, best mode of teaching research in the undergraduate level and limiting factor in conducting of research.

It was found that 38 percent would do research to improve their clinical knowledge, 25.5 percent were really interested to carry out research 20.6 percent would do research with a motive to provide better health care facilities, 7.6 percent to improve their resume, 4.1 percent to get recognition, 4.2 percent to learn new things where as four individuals were not at all interested to do the research (Table 5).

The 303 respondents mentioned about the being involved in clinical trials, 130 in experimental studies, 32 in epidemiological studies, 22 in retrospective studies and four said they were not all interested to carry out any type of research. The best mode of teaching research at under graduate level according to 42.2 percent of participants was workshops or conferences, 26.9 percent thought weekend classed were a better mode, 15.5 percent believed that it is better to learn research by being a part of any research activity, 8.6 percent thought research should be taught according to the personal interest and not as a compulsory subject, and only 7.1 percent preferred regular classes. Among the participants 39.3 percent believed that lack of time was a limitation in carrying out research during under-graduation course, 30.8 percent thought lack of guidance was a limiting factor, 14.1 percent stated that lack of funds was the problem, 2 percent thought there were lot of ethical issues in carrying out research at the undergraduate level where only 3.5 percent believed that there were no limitations in carrying out research in the under graduate level (Table 6 & Table 7).

**Table 4: Interest to pursue research as a career**

Variable	Interest to pursue research as a career		P-value
	Yes (%)	No (%)	
<b>Gender</b>			
Female	109(40.07)	163(59.93)	0.27
Male	81(36.98)	138(63.02)	
<b>Year of Degree</b>			
1 <sup>st</sup>	42(38.53)	67(61.47)	0.003
2 <sup>nd</sup>	48(35.56)	87(64.44)	
3 <sup>rd</sup>	44(34.65)	83(65.35)	
4 <sup>th</sup>	55(46.62)	63(53.38)	
Internship	1(50)	1(50)	
<b>Have doctor relatives</b>			
Yes	100(36.23)	176 (63.77)	0.225
No	90(41.86)	125(58.14)	
<b>Have research papers published</b>			
Yes	10(40)	15(60)	0.523
No	180(38.62)	286(61.38)	

**Table 5: Students interested in different types of study (N=491)**

Different study	Students interested (%)
Clinical trials	303 (61.7)
Epidemiological studies	32 (6.5)
Experimental studies	130 (26.4)
Retrospective studies	22 (4.42)
Not interested at all	4 (0.8)

**Table 6: Perception on most crucial outcome of medical training**

Variable	Crucial outcome of medical training		P-value
	Practice (%)	Research (%)	
<b>Gender</b>			
Female	231(84.93)	41(15.07)	0.11
Male	176(80.37)	43(19.63)	
<b>Year of Degree</b>			
1 <sup>st</sup>	96(46.83)	109 (53.17)	0.3
2 <sup>nd</sup>	108 (80)	27 (20)	
3 <sup>rd</sup>	109(85.82)	18 (14.18)	
4 <sup>th</sup>	93 (98.81)	25 (21.19)	
Internship	2 (100)	0 (0)	
<b>Have doctor relatives</b>			
Yes	237(85.87)	39 (14.13)	0.031
No	170 (79.07)	45 (20.93)	
<b>Have research papers published</b>			
Yes	22 (88)	3 (12)	0.34
No	385 (82.61)	81(17.38)	

**Table 7: Students interested in different types of knowledge-based activities (N= 491)**

Different types of knowledge based activities	Students interested (%)
Regular class	35 (7.1)
According to personal interest	41 (8.3)
By being a part of research activity	76 (15.5)
Weekend classes	132 (26.9)
Workshop/conference	207 (42.2)

## DISCUSSION

Assessment of medical student's attitudes towards research is an important aspect of the educational

process because it shows the association between the research program and the medical education. To our knowledge only a few studies measuring the medical students' attitudes towards research have been conducted.<sup>14</sup> Since the medical student's attitude towards health research has not been evaluated much, we performed a cross sectional study among the under-graduate medical students of IDS, IMS & SUM Hospital, Odisha. The recent outcome of the study provides us an overview about the determination of medical students towards the academic curriculum, research interest and career outlook during the pandemic circumstances. Most of the students agree on the importance of the research for identifying and investigating problems in a subject matter, potentially due to the fact that the college has established a medical research program.

We compared between male and female students' attitude and we found that female students had a higher agreement and much more interest in participating in research activities. Alaa et al.2017 reported similar type of result.<sup>15</sup> According to our result the best mode of teaching research at under graduate level according to 42.2 percent of participants was workshops or conferences. Networking is considered as an important part of any individual life. During the workshop's teachers and students from different institutes participate, by making new friends and meeting new people may help the students to be guided well and encourage them to enhance their thinking in a new direction. As many scientists attend the conferences it will be quite beneficial for the student who is interested to peruse his/her career in the field of scientific research by attending the conference and interacting with them. Students gain a lot of knowledge and get updated information regarding their work by listening to prominent personalities in seminars and workshops. Educational meets help the students to know about professional institutes and new discoveries in their field. Preparing a poster or presentation enables a student to skill their representation capacity and by presenting it they gain confidence about their knowledge and gain soft skills which will be valuable for their academic career. The skills of faculty members and their mentoring approach affect the student's attitudes towards research.<sup>16,17,18</sup> Therefore continued training programs for the faculties are needed to ensure more positive student's attitudes towards research.

## CONCLUSION

The outcome of the study provides us an overview about the determination of medical students towards the academic curriculum, research interest and career outlook during the pandemic circumstances. Most of the students agree on the importance of the research for identifying and investigating problems in a subject matter, potentially due to the fact that the college has established a medical research program.

## RECOMMENDATION

Research is an essential component of medical and dental teaching as it acts as a tool for building knowledge and for facilitating learning. Thus, research has to be made an integral part of the medical curriculum to help students acquire analytical and critical thinking skills. Medical colleges should include subjects like research methodology in their course curriculum and should provide research infrastructures as well as skilled supervisors in order to motivate and encourage the students for active participation in research. Although the students do not pursue a research career, the experience may help the student to skill themselves in independent learning and reviewing medical literatures to keep themselves updated.

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