

## DO STUDENTS PREFER RESEARCH AS A CURRICULUM IN MBBS?

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### ABSTRACT

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#### BACKGROUND

Biomedical research has very little representation in the graduate curriculum in India. Research and academic education operate in tandem and enhance critical appraisal skills of the students and orient them to evidence based medical practice in the years of their profession. It has been reported that students in medical schools report mixed interest in undertaking research during the study period.

#### MATERIALS & METHODS

This institute implements a short term student Research Program as a systemic annual curricular engagement. A questionnaire based assessment of the awareness, knowledge and attitude of MBBS students about research as a curricular activity was performed.

#### RESULTS & CONCLUSION

The responses of the medical students were tabulated and statistically analysed. Of the 347 respondents, 70.32% were aware that medical research was possible during the graduate course period in the medical school, in the current medical curriculum and 87.6% opined that research as a compulsory part of graduate medical curriculum was welcome.

#### KEYWORDS

Graduate Medical Education, Students Research, Need Assessment.

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**INTRODUCTION:** Medical research refers to clinical, biomedical and translational research of which clinical research confines to studies based on the clinical spectrum of diseases, diagnosis, prognosis, treatment and complications. Clinical research is similar to evidence based clinical practice as it entails collection of data on established protocols and procedures and study of variations. Biomedical research includes applied research leading to greater understanding of the organization and functioning of human body and its changes which will lead us in the future to answers for the present questions.

Research and Curricular Education need to operate in tandem to enhance critical appraisal skills of the students and orient them to evidence based medical practice during their professional years.<sup>1</sup> Paradoxically, there is a scarce representation of research in the present graduate curriculum in India. There are a few student research programs offered to graduate medical students across the country in a rare proportion of medical institutes.<sup>2</sup> This study was conducted to assess the awareness, knowledge, attitude and perceptions of the MBBS students on the need,

importance and effects of research on the graduate curriculum and professional career.

**MATERIALS AND METHODS:** This study was conducted at Tirunelveli Medical College, Tirunelveli, Tamilnadu during the year 2011-2012 after receiving institutional ethical approval. Of a total 756 MBBS students in the campus, 463 students in the first clinical (II MBBS), pre final (II MBBS) and final MBBS years were recruited into the study. The fresher and interns were not included.

The study was designed to collect and analyse data on graduate research through a piloted pretested questionnaire, with each question and area assessed independently. The questionnaire had broadly 5 areas: (1) Awareness of research (2) Knowledge of types of research and its importance (3) Cognitive and analytical effects of research on education (4) Hurdles in research, and (5) Career advantages of research. Each question had a four point answer set to choose from, which were open ended and had options for non-response or no opinion. The questions were issued to the students and each student was requested to enter the study voluntarily and arrive at his or her conclusion individually. No preface was provided on the issues questioned, its importance or the study and its protocol.

Of the 463 students recruited, 455 responded. Of these, 347 responses were complete on all the 5 segments. The answers were summarised, tabulated and analysed.

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**RESULTS:** Of the 347 students who responded with answers for all segments 35.33% were men, 64.67% were women, 17 had board distinctions, 12 had academic breaks and 9 had more than 2 board exam failures. Of the 347 complete responses, 109(31.41%) students were in the final year, 101(29.11%) were in pre-final years and 137(39.48) were in the first clinical year. The responses were classified and each assessment area were tabulated and analysed.

Of the total 347 respondents, 244 (70.32%) were aware that research was possible on the campus. 224 (64.55%) were aware of the campus support system while 76(21.90%) were equally aware of other support systems like the Indian Council for Medical Research and State agencies like the Tamilnadu State Science and Technology Council.(Table 1).

No.	Question	Response	No. of Respondents	Percentage of Respondents
1	Can Medical Research be done by a Medical Undergraduate	Yes	244	70.32
		Yes, If we ask	87	25.07
		Not aware	10	2.88
		Cannot	6	1.73
2	Who supports the student to undertake Medical Research.	I.C.M.R	33	9.51
		College	224	64.55
		Governments	14	4.035
		All	76	21.90
3	Does the present UG curriculum require a student to undertake research	Compulsory	35	10.09
		Optional	226	65.13
		Don't Know	26	7.49
		Not at all	60	17.29
4	How do you rate the need for student research programs	Essential	131	37.75
		Important	176	50.72
		Not important	36	10.37
		Not needed	4	1.15
5	Do you think student research programs will affect curricular work	Definitely No	124	35.73
		May Not	145	41.78
		Will Affect	64	18.44
		Don't Know	14	4.03

**Table 1: Awareness of Research**

On the segment on knowledge of types of research, 271(78.09%) of the respondents were aware that research was a combination of documentation, testing and analysis, 278(80.12%) expressed awareness of nuances of clinical research and 255(73.49%) of biomedical research. But in contrast, a major segment of the students were not appreciative of the line of convergence of clinical and biomedical research with 110(31.70%) being definite, 95(27.38%) not definite, 76(21.90%) being of the opinion that it was not and 66(19.02%) with no opinion on this issue. (Table 2).

No.	Question	Response	No. of Respondents	% of Respondents
1	What is Research?	Testing	4	1.15
		Documentation	8	2.31
		Analysis	64	18.44
		All of the above	271	78.09
2	What is Clinical Research?	Documenting Sickness	44	12.68
		Trying New Drugs	7	2.02
		Testing new Techniques	18	5.19
		All of the above	278	80.12
3	What is Biomedical Research?	Experimental Human Studies	63	18.16
		Animal Experimental Studies	18	5.19
		Molecular Studies	11	3.17
		All of the above	255	73.49

4	Does Clinical Research and Biomedical Research Go together	Definite	110	31.70
		Always	95	27.38
		Will Not	76	21.90
		Don't Know	66	19.02
5	What is advantage of Clinical and Biomedical Research together?	Evidence Based Understanding	56	16.14
		Better Analysis of Disease	57	16.43
		Knowing the Unknown	24	6.92
		All of the above	210	60.52
6	Research should be a compulsory part of the curriculum	Definitely	112	32.28
		May be	192	55.33
		Don't Know	32	9.22
		Will not Help	11	3.17

**Table 2: Knowledge of Types of Research**

The segment on cognitive and analytical effects of research on education had 8 questions on which 189(54.47%) were definite and 112(32.27%) were confident that research improves knowledge seeking. Of the 347 students 213(61.38%) were definite and 94(27.09%) were confident that research improves library use, similarly 173(49.86%) were definite and 134(38.62%) were confident that research helps in depth reading. In this study, 231(66.57%) were definite and 78(22.48%) were confident that research improves clinical understanding, and 177(51.0%) were definite and 117(33.71%) were confident that research helps improves innovative skills. (Table 3)

No.	Question	Response	No. of Respondents	% of Respondents
1	Knowledge Seeking	Definitely	189	54.47
		Can Improve	112	32.27
		May Improve	43	12.39
		Will not Help	3	0.86
2	Library Use	Definitely	213	61.38
		Can Improve	94	27.09
		May Improve	34	9.79
		Will not Help	6	1.73
3	Clinical Understanding	Definitely	231	66.57
		Can Improve	78	22.48
		May Improve	33	9.51
		Will not Help	5	1.44
4	In Depth Reading	Definitely	173	49.86
		Can Improve	134	38.62
		May Improve	34	9.79
		Will not Help	6	1.73
5	Examination Performance	Definitely	44	12.68
		Can Improve	104	29.97
		May Improve	158	45.53
		Will not Help	41	11.82
6	Study Period Satisfaction	Definitely	107	30.83
		Can Improve	141	40.63
		May Improve	77	22.19
		Will not Help	22	6.34
7	Will Improve my original thinking and allow to assert my interests	Definitely	213	61.38
		Can Improve	104	29.97
		May Improve	29	8.35
		Will not Help	1	0.28
8	Improves my innovative skills	Definitely	177	51.00
		Can Improve	117	33.71
		May Improve	49	14.12
		Will not Help	4	1.15

**Table 3: Cognitive and Analytical Effects of Research on Education**

In the segment on hurdles in doing research, the respondents were asked on what they felt were the hurdles in doing research in the campus, (37.18%) felt research was time consuming, 178(51.29%) felt it was dependent on the material and method used. 110(31.70%) felt that research was costly while 146(42.08%) felt cost was dependent on the methodology. 143(41.21%) felt that research did not always need state of art laboratory spaces, or costly equipment 202(58.21%). But 163(46.97%) felt that research needs special technical expertise. (Table 4)

No.	Question	Response	No. of Respondents	% of Respondents
1	It is time consuming	Yes, It is	129	37.18
		Not Always	178	51.29
		No, Wrong	16	4.61
		I have no opinion	24	6.92
2	It is Costly	Yes, It is	110	31.70
		Not Always	146	42.08
		No, Wrong	46	13.26
		I have no opinion	45	12.96
3	It needs special state of art labs	Yes, It is	132	38.04
		Not Always	143	41.21
		No, Wrong	27	7.79
		I have no opinion	45	12.96
4	It needs special technical expertise	Yes, It is	163	46.97
		Not Always	137	39.48
		No, Wrong	26	7.49
		I have no opinion	21	6.052
5	It needs costly equipment	Yes, It is	89	25.65
		Not Always	202	58.21
		No, Wrong	32	9.22
		I have no opinion	24	6.916
6	is dangerous	Yes, It is	8	2.31
		Not Always	94	27.09
		No, Wrong	199	57.35
		I have no opinion	46	13.25
7	It is un ethical to do research on patients	Yes, It is	18	5.19
		Not Always	98	28.25
		No, Wrong	166	47.83
		I have no opinion	65	18.73

**Table 4: Hurdles in Research**

In responding to questions on research as a career in medicine, 177(51.01%) were not aware that research was a career in medicine, 181(52.16%) felt that an experience in research will help in postgraduate training and thesis work, 185(53.31%) were definite that research experience will improve profession understanding, 187(53.89%) opined that graduate research experience may help a career in medical research and 101(29.11%) were definite and 163(46.97%) were inclined that a medical professional needs to do research as a routine. (Table 5)

No.	Question	Response	No. of Respondents	% of Respondents
1	It increases my chance to go abroad	Definitely	47	13.54
		Can Improve	106	30.55
		Don't Know	177	51.01
		Will not Help	17	4.89
2	It is needed in PG studies, so I would like to train now	Definitely	118	34.01
		May be	181	52.16
		Don't Know	36	10.37
		Will not Help	12	3.46
3	It is needed for understanding my job as a doctor, so I would like to train now	Definitely	185	53.31
		May be	114	32.85
		Don't Know	31	8.93
		Will not Help	17	4.89
4	It is needed for taking a research job, so I would like to train now	Definitely	67	19.31
		May be	187	53.89
		Don't Know	89	25.65
		Will not Help	4	1.15

5	It is a routine duty I need to do when I am a doctor, so I would like to train now	Definitely	101	29.11
		May be	163	46.97
		Don't Know	64	18.44
		Will not Help	19	5.47
<b>Table 5: Career Advantages of Research</b>				

**DISCUSSION:** Research as an inseparable component of medical science, is included in the curriculum of medical schools in developed countries while in underdeveloped countries, research takes a back seat, as governments are under pressure to produce more doctors in shorter time to cater to their health system needs. Research as a part of the graduate curriculum has 6 major questions that needed answers. (1) Is research a necessity in MBBS curriculum? (2) Should research be compulsory or voluntary for the MBBS students? (3) Are there adequate system supports to implement research in undergraduate course? (4) Would graduate students prefer to do research during the MBBS course? (5) Are there any hurdles for students who prefer to do research? (6) Would research affect regular academic work?

In this study, 70.32% of students were aware that research was possible on the campus, 64.55% were aware of the support system for research in the campus, while 21.90% were aware of such support systems outside like Indian Council for Medical Research (ICMR) and Tamilnadu State Science and Technology Council. The graduates had understanding that they had freedom of getting involved in research. Of the total respondents 65.13% were aware of the graduate medical education curriculum of Medical Council of India (MCI) and understood that research was an optional curricular work. The MCI stipulates that adequate emphasis is to be placed on cultivating logical and scientific habit, clarity of expression, independence of judgment, ability to collect and analyse information and to correlate them.<sup>3</sup> The national graduate medical curricular framework in India is guided by the need to cater to the high demand for producing doctors for the rural areas, hence adding to existing curricular time would not be realistic.

On the need for research in the UG curriculum, 37.75% responded that research was essential while 50.72% felt that it can be an elective study. On the effects of research programs on academic course, 35.73% were definite that there could be no adverse effect, while 41.78% were not as definite, 18.44% were concerned that research could affect the regular course work. Similarly, on a query on whether research needs to be made compulsory, 32.28% were definite and 55.33% were not definite of such a need. This signifies that the MBBS students were equivocal of the effect of research on the present curriculum. This needs to be analysed in the light of global experiences on research in undergraduate medical education.

Duke and Stanford Universities have regular curricular programs that encourage students to engage in dedicated periods of research. The school of medicine at Duke University has a third-year program while the school of medicine at Stanford University has a longitudinal, multiyear

program in research. These institutes have reported that their research programs instil in the under graduate students an appreciation of research and its methodologies, and motivates them to pursue careers in medicine and research<sup>3</sup>. The Duke University allowed its students to enter research, after a year of clinical rotations and curriculum incorporated basic clinical training prior to engaging in research.<sup>3</sup> The research and scholarly pursuits are important objectives of the third year curriculum as it imparts basic skills in statistics and evidence-based medicine.<sup>3</sup>

The respondents in this study responded to question on knowledge of types of research and its importance, and opined that research was a combination of documentation, testing and analysis. Of the 347 responses 80.12% had awareness of basic methods of research. But in contrast, a major segment of the students were not appreciative of the line of convergence of clinical and biomedical research with 31.70% being definite, 27.38% not definite and 19.02% had no opinion. These point towards a gap in the curriculum on basics of research especially the types, methodologies, importance, regulations and prospects. Hence, it is essential that basic training in methods of research will enable the MBBS students to understand research and co-opt its safe and scientific use in clinical practice. The Indian medical education curriculum needs reorganisation to include medical research as a subject.

It is theorized that research improves the student's need for library use and hence their ability to read medical literature and understand them, to make an in depth analysis and in the event, stimulate original thinking and assertion. In this study, the respondents were definite that research improves knowledge seeking (54.47%), improves library use (61.38%), helps in-depth reading (49.86%), improves clinical understanding (66.57%) and improves innovative skills (51.0%). This finding is in consonance to a Stanford University study on scholarly research projects, which projected an increased ability to read medical literature and understand its contents, an in-depth literature review and analysis of existing data in an area specifically chosen by the student.<sup>4</sup> In-depth reading reinforces context based reading, an essential aptitude to reference in clinical practice, critical appraisal skills and practice of evidence-based medicine. The intense clinical schedule of a final year medical student in the present curriculum does not have space to allow the student to reflect and observe new concepts in relation to past studies<sup>5</sup>. Research also helps students to enjoin study in non-traditional, non-clinical areas of study that involves the society especially rural populace, disadvantaged sections of society and special citizen groups, resulting in enhanced social awareness of the students, which is documented in the Stanford experience<sup>6</sup>. But the Stanford experience was

equivocal of the impact of research as an individual medical school curricular element on graduates' patient care skills and opined that it was exceedingly difficult to document.<sup>6</sup> The respondents in this study were conservative in the responses on whether examination performance would improve with research, with 29.97% feeling that research 'can' improve. Similarly respondents were equivocal on whether study period satisfaction would improve with research, with 30.83% feeling definite. This opinion of the respondents stem from their concerns that they may be forced to read and assimilate areas of study that are not specific or essential to the MBBS examinations. The Stanford experience has made a different observation that completing the research participation and the processes of the project in a prescribed number of weeks or months, while simultaneously conducting course work or rotations may not detract the student's ability to study for an examination or read on a current patient.<sup>6</sup> Julie Parsonnet et al (2010)<sup>6</sup> observed that "learning to juggle disparate obligations is also an important acquired skill. Clinicians routinely balance in-depth inquiry with clinical practice and other obligations like administrative, committee, volunteer work, family and personal responsibilities". This study also perceives that in-depth study of specific areas, can lead to intellectual pursuit and formation of academic discussion groups, in consonance with the Stanford experience, and creation of more physician-scientists, a shortage of whom exists and can impact patient care in the long term.<sup>7,8</sup>

The respondents in this study felt that research was - time consuming (37.18%), dependent on the material and methods (51.29%), financially demanding (31.70%), limited by the methodology selected (42.08%), limited by need special laboratory spaces (41.21%), need of special technical expertise (46.97%), not dangerous (57.35%), ethical to do research on patients and that ethical clearance was essential for doing research (47.83%). The Stanford experience reports that an unmotivated student involved in the scholarly research effort may suffer a reduced innovation<sup>6</sup>. Efforts at clearing the student misconceptions on research are essential.

Of the respondents, 51.01% were not aware that research was required to make a career in medicine outside India, while 52.16% felt that an experience at research as a graduate will help in postgraduate training and thesis work. The perception of this campus graduates that qualified medical professional needs research as a routine activity, is an encouraging response and is similar to international campuses, where students have been supported in research with the aim to inculcate research effort as physicians. This is considered essential for the physician to have confidence to probe deeply into the clinical conundrums encountered.<sup>6</sup> It has been reported in previously published studies that a dedicated research experience during medical school influences academic career choices.<sup>9</sup>

**CONCLUSIONS:** This study concludes that;

1. Research improves knowledge seeking, library use, in-depth reading, clinical understanding and innovative skills of the MBBS student and hence of the medical practitioner. Hence research needs to be an essential part of under graduate curriculum and the Indian medical education curriculum needs reorganisation to include medical research as a subject.
2. Research is considered time consuming, dependent on the material and methods, financially demanding, limited by the methodology selected and was limited by need special laboratory spaces and special technical expertise. Hence the MBBS student needs basic training in principles and methods of research will enable the MBBS students to understand research and co-opt its safe and scientific use in clinical practice.

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