

ORIGINAL ARTICLE

PERCEPTIONS OF MEDICAL STUDENTS ABOUT RESEARCH AT UNDERGRADUATE LEVEL

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Background: Undergraduate (UG) research is new but important concept in modern science. It is considered as an effective educational tool for enhancing the undergraduate medical experience. The objectives of the study were to know the perceptions of UG medical students towards research, main motivating factors and barriers faced by the students. **Methods:** It was Cross-sectional study with both quantitative and qualitative portions conducted in Ayub Medical College (AMC) from November 2018 to April 2019. The quantitative portion of the study was based on a simple questionnaire with 9 closed ended questions completed by 215 participants selected using stratified random sampling technique. Data was analysed using SPSS 20.0. The Qualitative portion of the study was based on 8 Focused Group Discussions (FGDs), two from each year, with 6-10 participants. The interviews were recorded and reported by obtaining informed consent from each participant. The audio recording of the FGDs was transcribed verbatim and content analysis was done by conventional content analysis. **Results:** Out of 215, 128 (59.5%) had a previous research experience mostly as a compulsory requirement of undergraduate curriculum; 134 (62.3%) were aware that research is a part of their curriculum. Lack of resources and lack of interest of students was main barrier, i.e., 152 (70.7%). For 133 (61.8%) participants, the main motivating factor was learning research methodology. **Conclusions:** Students were aware about research and their awareness about research increased with increasing year in medical school. Hardly any student had a research experience beforehand they took part in mandatory research in 4th year.

Keywords: Medical undergraduates; Undergraduate research

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INTRODUCTION

The undergraduate research being a part of the medical syllabus is pivotal in developing a nation's supply of future medical researchers. It is proven that it not only shapes their career pathways but also channels their minds in their approach to study.¹ Today medical education has evolved from learning facts written in textbooks to acquiring practical skills.² This makes it very important to promote problem-based learning (PBL'S), reasoning skills, and methodology of research among medical students from the very start of their career.³ Many medical students opt for research in their undergraduate programme, voluntarily or being a compulsory part of the medical course.^{4,5} However, medical students of developing countries have limited understanding, participation and contribution to research.⁶ This develops into a bigger issue when in the future finite number of doctors will become researchers.⁶ Evaluating the effectiveness of these projects is important as it should benefit the students rather than being another burden in the already strenuous course.⁷ Research is a process of steps used to collect and analyse information to increase our understanding of a topic or issue. It consists of three

steps: pose a question, collect data to answer the question and finally present an answer to the question.⁸

Analysis of PubMed Indexed papers authored by Medical Students showed United States of America to be on the top of list sharing a percentage of 68%, Europe 19%, Asia 13%, Africa 0%.¹ Japan is the only country contributing to a maximum of Asian percentage with almost no contribution by developing countries of Southeast Asia.¹ Students are required to do research in order to help the developing countries to improve their medical and scientific standards.¹ Several studies have been done to analyse the perception of students about research.³ A study carried out on 3rd and 4th year medical students of three different medical colleges in Ontario, Canada showed notable difference in their attitude towards research.⁹ A study in Dow medical college Karachi in 2016, showed that 8.9% of the students had “no” and 46.8% had “slight knowledge” in this regard. Only 4.8% claimed to have “excellent knowledge”, whereas the rest claimed to have “moderate knowledge” (39.6%).¹⁰ A study carried out to see the involvement of students in research in Khyber Medical College, KPK showed

that among the respondents, 9% were involved in a research project. Most students were interested in doing research, provided proper guidance is given.¹¹

Undergraduate research projects can be designed to fit a variety of class and patterns and to promote student learning at all levels of undergraduate education.¹² Undergraduate research experiences not only helps students develop a better understanding of their chosen subjects but simultaneously strengthens their comprehension of research and research methods.¹² It is a doorway to a bright career and paves the path for postgraduate research initiative.³ But, today the number of physician-scientists have declined due to the lack of effective training program and inadequate exposure of students to research. There is an urgent need of more skilled health care researchers thus the role of undergraduate research is even more important.^{13,14} Research motivation of a student depends on availability of resources, research training, inclusion of research in curriculum, financial incentives and proper mentorship.³ Some prestigious institutes have dedicated research forums, student journals and workshops to instil knowledge of research amongst their students.¹⁵

To make the most out of these platforms it is important to know the student's point of view regarding research which is the aim of this study and also to know the opinion of students who have never participated in a research to those who have. On a mass scale the students would benefit from improving the quality of research conduction and having well trained staff. This study is going to benefit undergraduate students, regarding research projects, and facilitators to make it a healthy and fun activity, where students can grow beyond their limitations.

MATERIAL AND METHODS

It was a cross-sectional study with Mixed study methods having both quantitative and qualitative portions. The study was conducted in Ayub Medical College Abbottabad, Pakistan from November 2018 to April 2019 with participants from 2nd, 3rd, 4th and Final year M.B.B.S.

The quantitative portion of the study was based on a questionnaire with 3 demographic variables: age, gender and class. There were 9 closed ended questions. A sample size of 215 was used via stratified random sampling technique. Fifty questionnaires were completed by each year after pre-testing on random students of another college in the town. Data was analysed using SPSS 20.0. Frequencies and percentages were used to describe categorical variables.

The Qualitative portion of the study was based on narrative type of research. A total of eight Focused Group Discussions (FGD), two from each year, with 6–10 participants in each group, were recorded and reported after obtaining informed consent from each

participant. Complete confidentiality was ensured. The audio recordings of the FGDs were transcribed verbatim and content analysis was done by Conventional and Descriptive method and results were derived from that. Exposure, knowledge and student perspective towards UG research was determined.

The ethical approval of the study was sought from Ethical Research Committee (ERC) of Ayub Medical College (AMC) Abbottabad.

RESULTS

The results of Qualitative portion of the study are given below.

Students gave different answers. According to them, research was defined as collecting information about a particular topic, to form a fluent consensus about a topic, to know about the problems prevalent in society and find a solution for them after a critical analysis. A student said, *"It is like investigating about something by gathering information from different sources and knowing what is unknown"*.

Students from 2nd and 3rd year had never taken part in research projects. Among the students interviewed from 4th and Final year only two students, respectively, had a past elective experience of research. The remaining 4th and Final year students had done research only as a compulsory part of curriculum.

One third of the 2nd year students and half of the 3rd year students have read a research paper at some point in their lives. All the students of 4th and Final year have read research papers. A Final year student said, *"We have to read them, otherwise how would we be able to plan a study?"*

Some of the students had attended research seminar or lecture once in their lives. A participant said, *"I once did, it was organized in AMC by Community Medicine department when I was in 1st year"*

Some students did not know of the importance of research, some said that it has no advantage. However, a few said that it is important because it adds up to the CV, helps in promotion later in life, and is important in post-graduation especially for a residency in West. A participant explained *"..... Some of my seniors opted for USMLE and PLAB and they suggested me to take part in Research."* A statement is quoted, *"Like clinical examination is a skill and scope going beyond that, same is with research. It is as important as knowing how a murmur sound like"*

All the students unanimously agreed that mandatory research project negatively affects their studies. The main reason was shortage of time, busy schedule, and skipping of classes for project completion. A participant said, *"Yes. Research is time consuming and increases the stress and burden of students"*

Upon interrogating the factors students mentioned were: a positive impact on CV and post-

graduation, securing good grades, publishing a paper in a renowned journal. However, a student put his view in these words, *“I had to pass my fourth year so I had to research”*

Students from second year were not aware that it is compulsory part of M.B.B.S curriculum in AMC. Participants from 3rd year had the idea because they had either heard it from the seniors or have had filled questionnaires of their senior’s research. Everyone said that it should be a compulsory subject. A common point that came forth was, *“It should be compulsory but not the way it is now. It is a progressive and step-wise process so it should be slowly taught from first year”*

All the participants were asked about the importance and conduction of research at UG level in their college. A student said, *“Mainly we are taught the methodology but there should be an incentive of publishing the paper as we invest our time in this”* Everyone was well aware that it is very important and should be done at least once before graduating from medical school.

Students from 3rd, 4th and Final year were asked about this. A student vocalized *“One reason we have not conducted any research before 4th year where it is compulsory is lack of guidance and motivation.”* Lack of resources was one main barrier that almost everyone had faced. *“They have made it compulsory part of curriculum but they have not allocated any funds or facilities for research.”* Lack of awareness among the students about importance of research, lack of competence of co-supervisors, lack of co-operation among the researchers and lack of practical approach were the common barriers faced. One student highlighted that gender difference is also a main issue.

The convener asked them about publishing their paper. Most students wanted to but there were some issues faced by them. Some respondents had no interest in it. A participant told us, *“I did a research with a sample size of 1000 and gave it my hundred percent but at the end it went un-noticed. That was heartbreaking but now I am trying my best to get it published”*

Some found it difficult, some tiring and some boring. A participant intended to do it again by saying, *“It was an amazing learning experience, I will definitely do it again.”*

More number of students from 2nd and 3rd year showed greater interest in research as career than 4th and final year. Final year participants had mixed answers, some wanted but some were not interested. One girl verbalized her thoughts in these words, *“Research is not a separate field. Being in this profession we have to do it tomorrow, no matter what”*

The participants were asked for suggestions regarding improvements in research conduction at Ayub Medical College. Awareness about importance of

research since the beginning of Medical studies is required. students should be given proper guidance regarding research. Lesser number of researchers should be included in a research group. Students should have the freedom to choose the topic of their own choice and should be supervised better by the teachers.

Tables 1 and 2 show the quantitative data.

Table-1: Total number of students from each year as study participants

	Males	Females	Total
2 nd year	28	22	50
3 rd year	30	20	50
4 th year	30	23	53
Final year	41	21	62
Total	129	86	215

Table-2: Results of Study variables

Participation in research n=215	Yes	128 (59.5%)
	No	87 (40.5%)
Role in Previous research n=128	Chief authors	36 (28.2%)
	Data collectors	60 (46.8%)
	Observers	24 (18.75%)
	Others	8 (6.25%)
Previous research experience n=128	Easy	64 (50%)
	Difficult	64 (50%)
Awareness about Research as compulsory part of curriculum n=215	Yes	134 (62.3%)
	No	81 (37.7%)
Attendance of a seminar or workshop related to research n= 215	Yes	84 (39.1%)
	No	131 (60.9%)
Negative effect of research on studies n= 215	Yes	58 (27%)
	No	157 (73%)
Main motivating factor n=215	Learning research methodology	133 (61.8%)
	Improving CV	73 (34%)
	Others	9 (4.2%)
Barriers in research n=215	Shortage of time	138 (64.2%)
	Lack of proper guidance	147 (68.4%)
	Lack of courses in curriculum	137 (63.7%)
	Lack of interest of students	152 (70.7%)
	Lack of resources	152 (70.7%)
	Others	14 (6.5%)
Usefulness of research at UG level n=215	Yes	168 (78.1%)
	No	47 (21.9%)
Research as a Career n=215	Yes	92 (42.8%)
	No	123(57.2%)

DISCUSSION

Our Study explores awareness, understanding and experience of undergraduate research amongst students of Ayub Medical College. This topic is extremely important because this issue can lead to improvement of research practices among future doctors.

It was noticed that the students had some idea as to what research was. The common idea being; search for a solution to a problem or finding unknown facts about a subject. Other researchers are also in line with the fact that undergraduate students do not have the exact knowledge about research but broadly know what it envisages.¹⁶ This finding is due to the lack of incorporation of research from the very start of medical school. Seminars, lectures and workshops conducted by the institute to instil learning through enquiry and research at an undergraduate level were encouraging for the students. Academics pave the pathway for a student to develop into a researcher.¹⁷ Some (39.1%) of the participants had attended such programs whereas the rest (60.9%) had not so. The students however blamed the faculty for not hosting such programs and expressed their interest for such arrangements. Researches conducted in USA concluded that 50% of the information attained about research was through seminars and attendance of such events leads to increase in positive attitude towards research.^{18,19} Research reading habit was seen in small number of both senior and junior students; fourth and final year students have a research reading habit as part of their literature workup. This is in accordance with the findings of Ejaz *et al.*²⁰

The relation between the year of undergraduate education and perception about research varied significantly. The study by Khan *et al.* conducted in Pakistan, showed that students' knowledge and attitude towards clinical research significantly improved with increasing years of education at medical school.²¹ Another study from Saudi Arabia reported the same trend.¹⁷

The number of students who want to pursue a career in research is declining with the increasing year. Our group discussions revealed that many students are inclined towards clinical practice and hate the idea of sitting behind a desk writing a research paper. This could be due to different barriers that they face. The main institutional barrier being lack of resources followed by lack of proper guidance, shortage of time and lack of research as a part of curriculum in 2nd and 3rd year. The important non-institutional barrier is the decreased interest of the student themselves mostly because they were unaware of the importance of research and considered it as a waste of time while some found it boring and dull. These findings are comparable with previous researches.^{22,23}

Our data indicates that 62.3% of the students have expressed their willingness for research to be incorporated in the medical curriculum on the other hand 37.7% have disagreed. The students have argued that research plays a crucial role for medical professionals because a lot of critical thinking and enquiry-based problem-solving skills are required in order to be a good physician. The students must engage

in finding latest information needed for clinical case studies. Medicine and research go hand in hand, for this reason research must be introduced from the beginning of the undergraduate career, on the contrary some students view research more in an elective rather than a compulsory domain. Asserting that research should not be implemented as a necessity but according to the will of the student with the topic of their liking.^{21,24}

Gauging the attitude of the participants, it was found that 61.8% Students wanted to do research at UG level as it helps them in learning the methodology, 34% want to improve their CV by adding a research experience and the qualitative portion showed one additional factor and that was selection for residency and post-graduation. This result from the qualitative and quantitative portion of our study coincided with a study conducted in three different Arab universities.²⁵

Our findings support an earlier research that majority of the students are involved in research as data collectors followed by a few students acting as chief authors of the paper.²⁰ About half of these students involved in research expressed their research experience as difficult while the other half found it easy. These findings are comparable to a research carried out in Pakistan.³ These results are however different to the findings of a similar study in Aga Khan medical college where about 90% of the students felt confident in interpreting and writing a research paper.

The qualitative and quantitative portion of the study clearly indicated that a greater number of male students had a previous research experience and are more interested to choose research as a career, which may either be due to the population type, or a greater number of male participants in research or gender difference can be one of the barriers, as indicated by some participants in interviews. A study in Pakistan and another study done in USA also reported the same gender difference.²⁶

The strengths of the study are that it is unique because very few studies of similar type are found in literature. The researchers worked hard to prepare the questionnaire and collect data after pre-testing. The results are particular and precise as they are based on open ended questions asked in FGDs along with closed ended questions of the questionnaire. The limitations are that the study is conducted in one medical college, therefore, caution needs to be exercised before generalizing them as they indicate the trends of one medical college. Another limitation is that in-depth interviews were not conducted.

CONCLUSION

The research was conducted to know the perception of students about research at UG level and to find suggestions for improvement in conduction of compulsory and elective research projects. All the

students were not well aware that what a research is but most of them had an idea about it. Very few students already had a research experience beforehand they took part in mandatory research in 4th year. Lack of resources, lack of interest of students, Lack of proper guidance and competence, shortage of time and lack of awareness about importance of research were the common barriers the students faced. The main motivating factor was learning research methodology, positive impact on CV and post-graduation, getting good grades, and publishing the paper. Research is a good learning experience and involves cognitive development and is equally important for the clinical and scientific study to evolve and innovate. Students want to pursue a career in research so efforts should be made to make UG research program healthier and finer. Despite this attempt of knowing the perception of students about research, more studies need to be conducted in order to make generalized statements.

AUTHORS' CONTRIBUTION

SA, NUH: Literature search, conceptualization, data collection, analysis, interpretation, write-up. NN: Proof reading. All other authors: Data collection.

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