

Research Trend, Career Preferences and its Effective Factors among Undergraduate Medical Students in Jinnah Sind Medical University, Pakistan

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Background: Research at undergraduate and graduate level is important in deciding career fields and future profession. The undergraduate studies are greatly enriched by doing research work. This study assess research trends among medical students by evaluating their research career choices, factors influencing their research career preferences and future plans at Jinnah Sind Medical University (JSMU) in Pakistan.

Methods: This study was based on cross-sectional survey in which 256 students were enrolled from 1st to 5th year of medical education.

Results: The study showed that there was a drastic change in approach to research from higher to lower grades as junior medical students were more interested in research work compared to seniors. It was found that most of the students planned to do both research and clinical practices and least number of students were interested only in biomedical and clinical research as a career choice. Surgery was ranked as the first choice by the students for research followed by internal medicine and gynecology.

Conclusions: According to this study, Student's career decision was mainly influenced by the desire of their family. There should be an official research division in every medical college and university to encourage students towards research. It can be concluded that there is yet less inclination of medical students towards research so there is need to facilitate students towards research in medical sciences by mentorship and developing better research infrastructure in medical universities.

Keywords: Research; Medical Students; Career Choices; Specialty Preferences; Clinical Research

روند تحقیق، ترجیحات شغلی و عوامل موثر آن بر دانشجویان پزشکی در دانشگاه علوم پزشکی جیناہ سیند، پاکستان

پیشینه: تحقیق در سطوح دانشجویان و فارغ التحصیلان در انتخاب زمینه شغلی و حرفه آینده از اهمیت بسزایی برخوردار است. مطالعات با انجام تحقیقات به صورت چشمگیری غنا یافته است. مطالعه حاضر به ارزیابی روندهای تحقیق میان دانشجویان پزشکی از طریق ارزیابی گزینش حرفه تحقیقاتی، عوامل موثر بر ترجیحات حرفه ای تحقیق و برنامه آینده در دانشگاه علوم پزشکی جیناہ سیند در پاکستان می پردازد.

روش تحقیق: مطالعه حاضر مقطعی بود و ۲۵۶ دانش آموز که در سال های اول تا پنجم آموزش پزشکی ثبت نام کرده بودند در مطالعه شرکت کردند.

نتایج: نتایج تحقیق بیانگر آنست که تفاوت فاحشی در رویکرد نسبت به تحقیق از سطوح بالا به پائین وجود دارد به گونه ای که دانشجویان پزشکی سال چهارم به مراتب از دانشجویان سال آخر علاقه بیشتری به تحقیق دارند. نتایج نشان می دهد که اکثر دانشجویان تصمیم به انجام تحقیق و فعالیت بالینی به صورت همزمان دارند و تعداد قلیلی از آنها تحقیقات پزشکی را به عنوان یک شغل انتخاب کردند. جراحی به عنوان اولین انتخاب دانشجویان برای تحقیق و سپس طب داخلی و زنان و کودکان بوده است.

نتیجه گیری: با توجه به مطالعه حاضر، انتخاب شغل دانشجویان غالباً تحت تاثیر علاقه خانواده شان بوده است. توصیه می شود در هر کالج پزشکی یک بخش تحقیقاتی رسمی جهت ترقیب دانشجویان با تحقیق باز شود. می توان نتیجه گرفت گرایش به تحقیق در میان دانشجویان پزشکی پائین می باشد و می باسد دانشجویان را به تحقیق از طریق ارائه مشاوره و ایجاد زیرساخت های لازم در دانشکده های پزشکی ترقیب نمود.

کلید واژه: تحقیق، دانشجویان پزشکی، انتخاب شغل، ترجیحات تخصص، تحقیقات بالینی

مسار البحث، التوجهات المهنية و عواملها المؤثرة على طلاب الطب في جامعة جيناه سيند الطبية في باكستان.

المقدمة: إن البحوث لها دور كبير عند الطلاب و المنتمين من الدرسة في مجال تم اختيار عملهم. تم افنا البحوث بالدرامات المكتفة. ترموا هذه الدرسة الى تقييم مسارات البحوث عند طلاب الطب من خلال اختيارهم لمجالات العمل و العوامل المؤثرة على هذه الاختيار في المستقبل في جامعة جيناه سيند في باكستان.

أملوب البحث: إن هذه الدرسة من النوع المقطعي و تم اشارك 256 من طلبة كلية الطب من السنة الاولى الى الخامسة. اشارت نتائج البحث الى أن هناك اختلاف كبير في رؤيه الطلاب بالنسبة الى الابحاث من المستويات العاليه حتى المتدنيه حيث ان هناك الرغبة في مجال الابحاث عند طلاب السنة الرابعه اكثر بكثير من السنة الاخيره.

اشارت نتائج هذه الدرسة الى أن طلاب يفضلون اجراء البحوث في المرحلة السريره و كان هناك عدد قليل من الطبه يفضلون أن يكون عملهم المستقبلي هو مجال البحوث الطبيه. كانت الجراهم هي اول اختيار للبحوث من قبل الطلاب و بعد ذلك القسم الباطني و النسائي و الاطفال.

الاستنتاج: تشير هذه الدرسة الى أن اختيار عمل الطلاب عادتاً يكون متأثراً بآراء عوائلهم. نوصي أن يتم انشاء مكاتب خاصه في الكليات يتم فيه اجراء بحوث رسميه الى سبل ترغيب الطلاب في مجال البحوث. نستطيع أن نستنتج أن الرغبة الى مجال البحوث قليله عند طلاب الطب و يجب ان يتم برمجته خاصه في هذا المجال في سبيل تطوير الارضيه المناسبه و ترغيب الطلاب في مجالات البحوث.

الكلمات الرئيسية: البحث، طلاب الطب، اختيار العمل، اولويات التخصص، البحوث السريره.

پاکستان کے صوبہ سندھ کی جناح یونیورسٹی آف میڈیکل سائنس میں تحقیقی عمل، کیریئر کی ترجیحات اور طلباء پر اس کے عوامل کے اثرات

بیک گراؤنڈ: میڈیکل طلباء اور فارغ التحصیل طلباء سے آئندہ کام کی ترجیحات کے بارے میں تحقیق کرنے کی بڑی اہمیت ہے۔ ان تحقیقات سے طلباء کو کافی فائدہ پہنچا ہے۔ ہماری یہ تحقیق پاکستان کے صوبہ سندھ میں جناح یونیورسٹی آف میڈیکل سائنس میں انجام دی گئی ہے۔ اس میں طلباء پیشہ ورانہ ترجیحات کی راہ سے ان کی تحقیقاتی روشوں کا جائزہ لیا گیا ہے۔

روش: اس تحقیق میں جناح میڈیکل یونیورسٹی کے دو سو چھپن طلباء نے شرکت کی۔ پانچویں سال تک ہر سال کے طلباء نے اس میں شرکت کی۔

نتیجے: اس تحقیق کے نتائج سے پتہ چلتا ہے کہ چوتھے سال اور پانچویں سال کے طلباء کی تحقیقاتی ترجیحات میں کافی فرق پایا جاتا ہے۔ یعنی چوتھے سال کے طلباء نچلی کلاسوں کے طلباء کی نسبت تحقیقات میں کافی دلچسپی رکھتے ہیں۔ اس تحقیق سے پتہ چلتا ہے کہ میڈیکل طلباء کلینیکل کلاسوں کے ساتھ ساتھ تحقیقاتی کام کرنے میں دلچسپی رکھتے ہیں۔ ان میں سے بہت سے کم طلباء نے میڈیکل ریسرچ کو کیریئر کے طور پر اپنایا ہے۔ تحقیقات کے لئے سرجری پہلا انتخاب تھا، اسکے بعد انٹرنل میڈیسن اور گائناکالوجی پھر اس کے بعد طب اطفال کا نمبر آتا ہے۔

سفارشات: اس تحقیق کے پیش نظر میڈیکل طلباء نے اپنا کیریئر اکثر اپنے گھرانے والوں کی خواہش کے مطابق اپنایا ہے۔ یہ سفارش کی جاتی ہے کہ ہر میڈیکل فیکلٹی میں ایک شعبہ تحقیق رکھا جائے جو طلباء کو تحقیقات کی طرف راغب کرے۔ اس تحقیق سے یہ نتیجہ اخذ کیا جاسکتا ہے کہ طلباء تحقیقات کی طرف راغب نہیں ہیں اس وجہ سے طلباء کو مشاورت اور بہتر ریسرچ انفراسٹرکچر کے سہارے تحقیقات کی طرف راغب کیا جائے۔

کلیدی الفاظ: تحقیق، طلباء، کیریئر، کیریئر کی ترجیحات، کلینیکل تحقیقات.

INTRODUCTION

Research in undergraduate studies is helpful and considered to motivate students towards successful career and advanced grades in various fields (1, 2). In clinical and biomedical area, research maintains the direct relation with sick people and clinical environment (3). Research training or experience had a progressive impact on research performances and it also significantly effect on the advancement of career (4). Kassebaum *et al* assessed that the graduating students who participated in research activities could publish their work in their first two years and were more interested in research careers, while those who were never involved had least contribution in all four years of medical education. According to studies, students who aimed to go for surgery after graduation were having high rates of research involvement during medical school (5).

Paiva and Haley perceived in their study that research was the best productive and knowledgeable experience for majority of medical students (6). Students and young doctors have to take the decision about future specialties in their life, which is among one of the difficult choice. Many factors influenced career selections and majority of students aim to start choosing their profession in early educational life (7, 8). Certain norms such as esteem, working hours of respective field, financial incentives and practice location encourage the student's future career choices (9). Students have different ideas and planning for their future at the time of their admission in medical field (10). Undergraduate students are exposed to variety of medical specialties but their decision depends upon experiences mainly after the completion of basic medical sciences (11).

Preferences for post graduate medical specialty by medical students and doctors have significant role in the development of health care structure, particularly when there is a lack or surplus physicians. Investigating and studying the future career selections can be supportive in organizing a better educational structure and management. Knowledge obtained by such study will be helpful in the

advancement of health care system (11).

Numerous researches have been done on finding the career selection of medical students and the factors that stimulate them to follow their career options (3). Diminutive researches have been conducted to evaluate the research career choices among medical students and especially in developing countries. Medical education research is mainly based on educational structure rather than clinical aspect but majority of work has been done on clinical practice (6).

Our main objective of this study was to evaluate the research career preferences and trends among undergraduate students of Jinnah Sindh Medical University (JSMU). We assessed factors persuading their choices, student's involvement in research and research environment in their medical school.

METHODS

Study Settings and Participants:

This was a cross sectional survey on the students of JSMU. Students from 1st to final year were included in this study and a total of 256 students participated after giving verbal consent. Inclusion criteria was all those students who were present at the time of survey and gave verbal consent were included in the study and exclusion criteria was all absentees and those who refused to participate were excluded.

An organized questionnaire was designed by the authors in English language, which is the official language of university. Eighteen questions were asked including age, gender, year of study, postgraduate plans and their undergraduate work on research. An online form was also created for the students of first and fourth year as due to their exams, they were not able to come to college.

Statistical Analysis:

Data was presented in the form of valid percentages. Frequency percentages were also calculated for the Likert scale variables. Cronbach's alpha for the variables was also measured to about 0.78, which showed the internal consistency and reliability of the questionnaire. The analysis was performed using IBM SPSS software version 20.

Table 1. Preference for field of study and research after graduation.

Preferences	Field	1 st Year	Field	2 nd Year	Field	3 rd Year	Field	4 th Year	Field	5 th Year
Grading										
1	Both clinical and research	31	Both clinical and research	41	Both clinical and research	28	Both clinical and research	27	Both clinical and research	25
2	Clinical practice only	11	Clinical practice only	14	Clinical practice only	19	Clinical practice only	08	Clinical practice only	22
3	Undecided	06	Undecided	07	Undecided	05	Undecided	02	Undecided	03
4	Research in biomedical sciences	02	Clinical research	02	Research in biomedical sciences	02	Clinical research	00	Clinical research	00
5	Clinical research	01	Research in biomedical sciences	00	Clinical research	00	Research in biomedical sciences	00	Research in biomedical sciences	00
Total		51		64		54		37		50

Table 2. Research field preference after graduation.

Specialty Choices	Rank No. 01	Percentage	Rank No. 02	Percentage	Rank No. 03	Percentage	Rank No. 04	Percentage
Anesthesiology	0	0.00	1	0.68	3	2.19	3	2.61
Dermatology	3	1.70	9	6.12	9	6.57	10	8.70
Ear, Nose and Throat	4	2.27	7	4.76	24	17.52	18	15.65
Emergency medicine	6	3.41	16	10.88	7	5.11	1	0.87
Family medicine	1	0.57	5	3.40	7	5.11	6	5.22
Internal medicine	24	13.64	7	4.76	7	5.11	5	4.35
Neurology	19	10.80	20	13.61	13	9.49	17	14.78
Obstetrics/Gynecology	24	13.64	15	10.20	14	10.22	6	5.22
Ophthalmology	10	5.68	0	0.00	2	1.46	4	3.48
Pediatrics	17	9.66	23	15.65	8	5.84	12	10.43
Psychiatry	17	9.66	13	8.84	23	16.79	12	10.43
Radiology	4	2.27	2	1.36	5	3.65	5	4.35
Surgery	38	21.59	25	17.01	14	10.22	5	4.35
Multiple specialties	2	1.14	1	0.68	0	0.00	6	5.22
Others	7	3.98	3	2.04	1	0.73	5	4.35

Table 3. Factors effecting career choices.

Factors	Degree of Influence					
	Very Strong		Strong		Moderate	
	No.	Percentage	No.	Percentage	No.	Percentage
Family's wish	66	25.78	32	12.50	52	20.4
Financial incentives	52	20.31	45	17.58	48	18.8
Good marks in that subject	34	13.28	37	14.45	27	10.6
More patients in your respected field	33	12.89	43	16.80	36	14.1
Job opportunities	28	10.94	55	21.48	41	16.1
Good teaching atmosphere in university	26	10.16	19	7.42	15	5.9
Serving rural areas	17	6.64	25	9.77	36	14.1

RESULTS

Total 256 students were enrolled in the study from Jinnah Sindh Medical University, out of which 52 were males and 204 were females. All the participants were asked to select parent's income range in order to know about their socioeconomic status. Highest number of students (57.42 %) belonged to the middle class family; some (25.0 %) were associated with high class and few (17.58%) students lied under the category of low socioeconomic status.

Field of Study after Graduation:

In response to the question of field of study after graduation, majority of the medical students had decided to do both clinical practice and research, while some were interested in clinical practice only. Least response came for research in biomedical sciences and clinical research (Table 1)

Future Specialty Choices for Researchers:

The first four chosen specialties for the future research work were surgery, gynecology, internal medicine and neurology. Highest percentage of students had decided to do research in surgery after graduation (Table 2).

Factors Persuading Career Choices:

For the question about the factors influencing career choices among medical students, family's wish had strong degree of influence followed by financial incentives and then good marks in that subject. Job opportunities, good teaching atmosphere in university and serving rural areas were less persuading factors (Table 3).

Research Interests and Student's Involvement:

A question about the reason of selecting research as a career was asked particularly from those students, who opted for research work in future. Maximum number of students wanted to do research to explore the knowledge about various scientific aspects, many students were interested in research and few were more concerned about publications, while according to few it is less competitive field. Most of the students (66.80%) had never done any research work, while 23.83% were aware of it and had already done research studies. It was noticed that many of the student's research projects were not published and only few had any publication (Table 4)

A likert scale was used to identify the student's perception on importance of research and need of mentor in building

Table 4. Likert chart about different research related questions.	
Questions	Percentage response
Why you want to be a researcher?	
To explore the knowledge about various scientific aspects	63.84
For publications	10.73
Interest in research	23.73
Less competitive field	01.69
Have you done any research projects/ study during your medical education?	
Yes	23.83
No	66.80
Currently involved	09.38
How many of research publications do you have?	
1	05.08
2	0.00
3	0.39
4	0.78
More than 4	0.00
None	93.75
Research is important in building successful career.	
Strongly agree	19.14
Agree	51.56
Neutral	20.70
Disagree	04.69
Strongly disagree	03.91
Mentor/ Supervisors are required to make a successful career in the field of research.	
Strongly agree	35.55
Agree	52.73
Neutral	06.64
Disagree	03.13
Strongly disagree	01.95

successful career. More than half students agreed the need of mentor along with the significance of research in building fruitful career, whereas others were neutral and some disagreed.

Research Environment and Future Plans:

A higher percentage of students marked the environment of research as poor (Table 5), while some rated as average. Remaining students were satisfied with the research settings by appraising as good; however few also rated as excellent. Majority students had not decided their postgraduate future plans, however some students preferred to continue their postgraduate studies, though few want to move abroad for higher studies or practice.

Career counseling is essential in every field of study. Participants were asked to answer a question related to the need of career counseling for choosing medical specialty

Table 5. Research environment and future plan of students.	
Questions	Percentage response
How is the environment of research work in your university?	
Excellent	01.56
Good	23.83
Average	36.33
Poor	38.28
What are your study plans after MBBS?	
Inland	23.05
Abroad	36.72
Undecided	40.23
Do the medical students need career counseling for choosing the career during medical education?	
Yes	81.25
No	01.95
May be	15.23
Don't Know	01.56
What resources will you prefer to acquire Research Training?	
Research institutes in ...	34.38
Online Research courses	12.50
Outside .../ Foreign country	13.28
Your own mentor/ supervisor	22.66
Undecided	17.19

during medical education. Maximum numbers of students were in favor of career counseling during medical education (Table 5). It was good to observe that research institute in our university was on the top selected preference to acquire research training. Second choice was their own mentor/ supervisor followed by the research institutes abroad and then online research courses.

DISCUSSION

Different projects have been conducted to know the future career choices for medical students but very less work has been done on student's choices for future research trends in medical students. Most of studies have identified career specialty preferences but they are related to clinical specialties. An international study was conducted in 2011 by Tan *et al* on inclination towards a research career among first year medical students. They concluded that majority of the first year learners were not influenced towards a career in research (3). According to this study, most of the first year students aimed to pursue their career in both research and clinical practice, although they were not involved in research work yet. The student's hard work in research activity gives fruitful results and enhances the likelihoods of making their aims true for their bright career in medicine. In addition, it also help in data search as well as medical writings (12). Russel *et al* reported that an undergraduate research

opportunity boosts up confidence, mindfulness and thoughtfulness (1). Our study assessed the student's perception on significance of research and concluded that majority of students approved the role of research for successful career.

Students' involvement in research activities is increasing with time and growth of technology. We observed that young medical students of 1st and 2nd year were more inclined towards research along with the clinical practice. However, final year students were more interested in doing clinical practice only as compared to junior batches. Tan *et al* concluded in their study that those students who had previous research experiences or joining graduate medical school programs were more inclined towards research as career choice. They also noticed that first year students were not much fascinated to pursue research career (3).

Career guidance must be provided in the early years of medical education with strong suggestion and in accordance with the basic desires and physiognomies of an individual (16). According to this study, bulk of students supported the need of career counseling for choosing career during medical tutoring. It helps in knowing trends of various fields and lead to selection of correct path.

Migration of medical student from developing countries is a universal problem and present an alarming situation (8). It was observed that significant numbers of medical students were interested in moving abroad for postgraduate studies.

Clinician scientists are vital companions of a research communal. Research community provides many chances to resolve the primary and critical issues of patients. We determined the research setting at JSMU and perceived that many students were not satisfied with it mainly due to the lack of proper research oriented atmosphere and research staff. According to Say-Beng Tan *et al*, Medical Schools should encourage students to involve in research activities and get publications before graduation. These steps will convince them to follow a scientific profession (13, 14)

Medical students usually decide their research career during medical education. They are mostly convinced by research events or some personalities. James R. McPherson, and Merlin Mitchell clinched that students can be motivated towards research in an undergraduate level if medical institute provides them concerned staff, administrative and speculative support (14). Most of medical universities and colleges in Pakistan lack the systemic process of career guidance to medical students. Therefore there is dire need to make a proper system to let the students know about current trends of research in basic and clinical specialties. Medical students studying in highly research oriented universities with the supportive environment were more likely to gain interests in research work (15). Our study noticed the deprived research environment has influence and hence very few individuals showed concern in biomedical and clinical research.

The study suggested that, young medical students of new batches are more inclined towards research along with clinical practice. Although, they are not yet exposed to clinical settings but they have planned to carry on both research and clinical practice together. Most of the students were not involved in research, while some had research experiences but only few published their research work. Trends of Research are increasing with time due to enhanced competency and interest in research work. Research environment was rated as average and poor by majority of the students, it indicates that much effort is required to build a strong research setting in the medical schools. It will be interesting to see similar studies in other medical institutes of the country to have a better and elaborative picture of research trends among medical students of Pakistan.

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