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Kiran Ejaz

*Aga Khan University*

Muhammad Shahid Shamim

*Dow University of Health Science*

Muhammad Shahzad Shamim

*Aga Khan University*

Syed Abid Hussain

*Dow University of Health Science*

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## **Involvement of Medical Students and Fresh Medical Graduates of Karachi, Pakistan in Research**

Kiran Ejaz,<sup>1</sup> Muhammad Shahid Shamim,<sup>2</sup> Muhammad Shahzad Shamim,<sup>3</sup> Syed Abid Hussain<sup>4</sup>  
Department of Emergency Medicine,<sup>1</sup> Department of Neurosurgery,<sup>3</sup> Aga Khan University, Dow University of Health Sciences,<sup>2,4</sup> Karachi.

### **Abstract**

**Objective:** To study the involvement in research, of final year medical students and fresh graduates of Karachi, Pakistan and to identify the factors influencing their interest in medical research.

**Methods:** A cross-sectional, questionnaire based study was conducted in 2007-2008. Five institutes representing the private and public hospitals in the city were selected by cluster sampling. Final year medical students and fresh graduates were included. Descriptive statistics were charted using SPSS v.16 after double data entry.

**Results:** Out of 378, 186 (49%) participants had journal reading habits due to the requirement of their institution. Mostly, 157 (41%) undergraduates had already participated in a research project, however mostly in the field as data collectors or computer work. Institutional influence and speciality of interest was found to be statistically significant factors related to a respondent's interest or involvement in research. ( $X^2 = 9.970$ , p-value = 0.007).

**Conclusion:** There is keen interest and involvement in research, among final year medical students and fresh graduates of Karachi, Pakistan. However, the factors driving them are based on their university research encouragements and future plans.

**Keywords:** Research involvement, Medical students, fresh graduates, Pakistan (JPMA 61:115; 2011).

### **Introduction**

Research has a pivotal role in medical profession. The inspirations for most physicians and researchers are the unanswered medical questions and reputation, eventually improving patient care. Traditionally, medical doctors have

been either pure clinicians or primarily researchers. As with other professions there is a need for multitasking for physicians as well. Emphasis has been made to integrate research within the medical community.<sup>1</sup> Importance of having research as part of the medical curriculum is also

suggested by researchers as a good source of information and learning.<sup>2</sup> Globally speaking, within the disparity of medical curriculums both at undergraduate and graduate levels, research has been a focal point. Page et al, shed light on attitudes of developing world physicians and their perception on local and foreign journals and research.<sup>3</sup> In Karachi, only few medical universities have adapted to this positive change. The research culture is welcomed in a handful of universities mainly influenced by their own faculty who are either true medical scientists or do research to survive in the list of vast growing medical colleges.<sup>1</sup> Most senior physicians have had no formal research training but are masters in medical academia and clinical practice.

At the post graduate level, the authorities under the umbrella of College of Physicians and Surgeons Pakistan (CPSP), Pakistan Medical and Dental Council (PMDC), Pakistan Medical and Research Council (PMRC), Ministry of Health and Higher Education Commission (HEC) are trying to promote good quality research through compulsory workshops. Synopsis writing is mandatory for the postgraduates however most are involved in exploring minor study objectives which seldom get published in broadly read journals and are only submitted to CPSP to be locked in cupboards.<sup>4-7</sup> Due to lack of research driven and realistic policy making, including those of research, there has been failure of healthcare policies in the past.<sup>8</sup> As a future incentive and to address the needs of our people, we would also be able to train pragmatic health policy makers on basis of evidence provided by research. Encouraging young physicians to participate in research will give a much needed boost to the local medical field. Data from a North American study on research based health activism curriculum provides good feedback in this aspect. It is not limited to research activities but also broadens career goals.<sup>9</sup>

Factors like guidance from research oriented mentors, funding and training, all play a crucial role in conducting high quality research.<sup>10-12</sup> Students from private universities themselves want to have research courses right from the early years of medical school.<sup>13</sup> Unfortunately, even the best medical university of the city reports to have medical students with inadequate research knowledge and moderate interest towards this aspect of medical profession.<sup>14</sup>

There is a gap of authentic literature representing the public sector. However, observation shows keen interest in research by public sector medical students but lack of quality guidance creates hindrances for them.

This highlights the disparities of either curriculum driven or medical research amongst the young medical minds of the city. This study was carried out to observe the involvement in research, of final year medical students and fresh graduates of Karachi, Pakistan and to identify the factors

influencing their interest in medical research.

## Methods

This cross-sectional study was conducted with the help of a self administered, pre-tested questionnaire. To establish content validity two experts were asked to critically review the content of the questionnaire. Main outcome of interest was considered to be involvement of the participants and completing the project to publication stage. We included all levels of projects and publications including case reports, letter to the editor and editorials. Closed ended questions were asked regarding the participants' research information, journal reading and publication practices. The main study was conducted at five of the cities' main medical schools and their attached hospitals, after institutional permissions. These were Abbasi Shaheed Hospital (ASH) with Karachi Medical and Dental College (KMDC), Aga Khan University Hospital (AKUH) and Medical College, Civil Hospital Karachi (CHK) with Dow Medical College (DMC), Jinnah Postgraduate Medical Center (JPMC) with Sindh Medical College (SMC), and Hamdard Medical College (HMC) and hospital. All the above mentioned universities are accredited by Higher Education Commission.<sup>15</sup> Each of the institutes represented their district and the private and public hospitals in the city. We included only final year medical students and fresh graduates, including house officers/interns and residents from year one to three, from all specialties. Data collection process was started in October 2007 and continued till February 2008. Trained research officers from each institute collected the data by approaching the study participants at their own institutes.

Stratified Sampling was used with proportionate representation of each institute. Sample size of 400 was calculated with assumption of 50% prevalence, as there is no previous study providing prevalence or of this scale. Level of significance was kept at 95% Confidence level and alpha of 0.05. After double data entry in SPSS version 16.0, frequency distributions and cross-tabulations were used as main tools for presenting descriptive statistics. Pearson Chi-Square ( $X^2$ ) for categorical data was applied for inferential statistical analysis. Weighted calculations were limited to the number of publications according to the academic standing. It was essential to weigh the data accordingly as the total number of students decrease as they progress through the level of academic standing. Without weighing, the data would portray the misrepresented conclusion affected by the larger number of students at a single level of education.

## Results

The study participants' characteristics are explained in Figure. Out of the 400 medical students and young doctors approached, 378 responded, with a response rate of 94%. Figure explains the distribution of participants from each

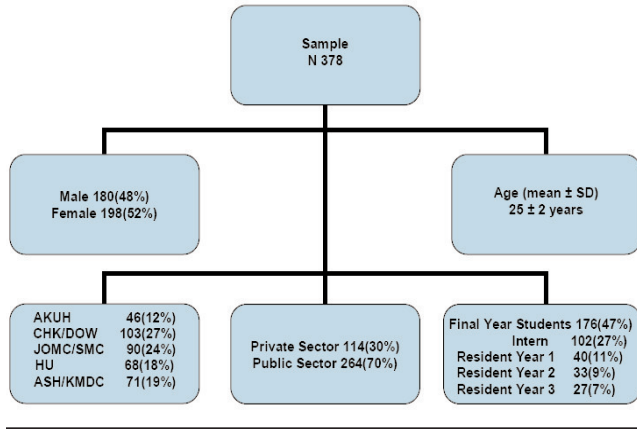


Figure: Characteristics of study participants.

institute and graduation status. Out of the 378 respondents, 117 (31%) were either working in a surgical specialty or were planning to pursue it later in their career. Internal medicine was the common interest of 207 (53%) while 60 (16%) were yet indecisive of their specialty.

One hundred and thirteen (35%) respondents were the first doctors in their family, 87 (23%) had multiple family members who were physicians and 83(22%) had only distant relatives who were practicing medicine. The rest either had a single immediate relative in the field. Details of participants' research information, journal reading and publication practices are given in Table-1.

On subgroup analyses, various factors related to a person's interest and involvement in research were analyzed. Age ( $X^2=16.296$ ,  $p$ -value = 0.091) and gender( $X^2=1.911$ ,  $p=0.167$ ) were not found to be statistically significant factors related to a respondent's interest or involvement in research. Table-2 explains other influencing factors behind their interest in research and publications. As article reading habit was compared to those who were already in either a surgical, medical specialty or had not decided about their specialization; 297(78.6%) had reading interests. Of these 165(82.1%) were from medicine and allied fields, 94(31.6%) from surgical side and 38(12.8%) had not decided their speciality as yet ( $X^2=9.970$ ,  $p=0.007$ ).

A possible relation of the participants' publication practices was calculated by evaluating them according to their level of motivation, their academic standing, the type of institute they were part of and family influences. Table-2 shows the relation to research and publication influences. The data suggests that 57(32%) final year students, 20(20%) interns, 12(44%) 3rd year residents, 10(25%) first year residents and 8(24%) 2nd year residents were keen to publish. ( $X^2=9.196$ ,  $p=0.056$ ) Though as the proportion of final year students were more we therefore weighted them according to their academic standing and subsequently out of a 767 total

Table-1: Frequency and percentage of responses from study participants.

| Variables   | N   | %  |
|---|-----|----|
| <b>Academic standing at conducting first literature search:</b>               |     |    |
| ▪ At Undergraduate level  | 187 | 49 |
| ▪ At Post graduate level  | 69  | 18 |
| ▪ Not as yet  | 122 | 32 |
| <b>Medical journal reading habit</b>  |     |    |
| ▪ Yes   | 297 | 79 |
| ▪ No  | 81  | 21 |
| <b>Academic standing at reading first medical journal</b>                     |     |    |
| ▪ At Undergraduate level  | 245 | 65 |
| ▪ At Post graduate level  | 61  | 16 |
| ▪ Not as yet  | 72  | 19 |
| <b>Frequency of reading medical journals</b>                                  |     |    |
| ▪ Never   | 41  | 11 |
| ▪ Once a month  | 86  | 23 |
| ▪ Once every three months   | 63  | 17 |
| ▪ Even less frequently  | 188 | 50 |
| <b>Need for reading medical journals</b>                                      |     |    |
| ▪ Feels that there is no need   | 67  | 18 |
| ▪ As part of curriculum   | 186 | 49 |
| ▪ Out of interest   | 125 | 33 |
| <b>Information regarding Pakistani medical Medline indexed journals</b>       |     |    |
| ▪ Do not know   | 242 | 64 |
| ▪ One   | 15  | 4  |
| ▪ Two   | 34  | 9  |
| ▪ Three   | 49  | 13 |
| ▪ Four  | 20  | 5  |
| ▪ More than 5   | 18  | 5  |
| <b>Would like to contribute to any research project</b>                       |     |    |
| ▪ Yes   | 311 | 82 |
| ▪ No  | 67  | 18 |
| <b>Contribution to research projects</b>                                      |     |    |
| ▪ As investigator or co-investigator  | 32  | 8  |
| ▪ As data collector   | 157 | 41 |
| ▪ As both, investigator and data collector                                    | 134 | 35 |
| ▪ Neither   | 55  | 15 |
| <b>Is currently part of a research project</b>                                |     |    |
| ▪ Yes   | 109 | 29 |
| ▪ No  | 269 | 71 |
| <b>Have had a manuscript published under their name</b>                       |     |    |
| ▪ Yes   | 107 | 28 |
| ▪ No  | 271 | 72 |
| <b>Reading habits about rare articles or sub-specialty journals</b>           |     |    |
| ▪ Medical education   | 119 | 31 |
| ▪ Medical ethics  | 88  | 23 |
| ▪ Both  | 63  | 17 |
| ▪ Neither   | 108 | 29 |
| <b>Opinion on current exposure to medical research</b>                        |     |    |
| ▪ Adequate  | 82  | 22 |
| ▪ Inadequate  | 225 | 59 |
| ▪ Do not care / makes no difference   | 71  | 19 |
| <b>Would like to have medical research as part of basic medical education</b> |     |    |
| ▪ Yes   | 345 | 91 |
| ▪ No  | 33  | 9  |

279(29%) had already published their manuscript. Sixty (44%) of 3rd year residents published followed by 57(32%) final year students, 40(20%) interns, 32(24%) 2nd year residents and then 30(25%) first year residents. ( $X^2=27.926$ ,

**Table-2: Factors behind interest in research and publication.**

| Variables                  | Manuscript publication |         |         |
|----------------------------|------------------------|---------|---------|
|                            | Yes n(%)               | No n(%) | p-value |
| <b>Self motivation</b>     |                        |         |         |
| Present                    | 39(36)                 | 86(32)  | 0.38    |
| Absent                     | 68(64)                 | 185(68) |         |
| <b>Academic standing</b>   |                        |         |         |
| Undergraduate              | 57(32)                 | 119(68) | 0.1     |
| Graduate                   | 50(25)                 | 152(75) |         |
| <b>Type of Institution</b> |                        |         |         |
| Private Sector             | 57(50)                 | 57(50)  | 0.0001* |
| Public Sector              | 50(19)                 | 214(81) |         |
| <b>Family Influence</b>    |                        |         |         |
| Physicians                 | 75 (30)                | 172(70) | 0.223   |
| No physicians              | 32(24)                 | 99(76)  |         |

\*Significant p-value.

p =0.0001) Influences from a family member were not statistically supportive though 28(32%) of the 87 participants who had multiple physicians in their family wrote comparatively more than the others.

## Discussion

Our main study findings showed that majority of the medical students from either public or private sector universities were keenly interested in medical research. Statistically significant factors behind this interest were institutional influence and type of specialty of interest for further fields like medicine.

Though we concentrated on getting data from most institutes, our limitations are that we did not question regarding the period of initiation of formal training and publication which would indicate the level of interest of the candidate. Our study population comprised of younger doctors only, if we had taken all senior residents with fellows and junior consultants, we could have achieved this goal as well. Our aim was to see the study participants' interest in research; however their knowledge on research methodology could give an in-depth view of their understanding, in conducting research and to qualify as an author. Keeping in view the answers we got in the pretest of the study we inquired 'Need for reading medical journals', as a single response question. However, it would be possible to respond positively regarding, reading out of interest and as part of the curriculum.

Research plays a key role in designing, maintenance and up gradation of any curriculum.<sup>16</sup> The turn of the century has witnessed an explosion of medical information with increased demands on the knowledge and learning methods of medical graduates. We found similarities in thoughts of our participants to this international trend of inclining towards research once their clinical knowledge is at a certain level. Researchers concluded that local research and publications are more likely to change one's clinical practices and that it should

be encouraged.<sup>3,17,18</sup> Our data shows that 225 (59%) participants themselves rated the current research status and teachings of Pakistan to be inadequate and 345 (91%) would like to have medical research activities, similar to the findings of Astin J et al findings.<sup>19</sup> Any interesting finding in local residents' curricula designed by College of Physicians and Surgeons (CPSP) is that they only need to submit desertions to CPSP. This enables them to qualify for graduation. The quality of work submitted is not peer-reviewed or presented in any formal thesis defense presentations.<sup>4</sup> As it has been noted by our study that the participants' interest were driven by the institutional or academic influence. Raising the bench mark might result in a drastic shift in medical research being conducted in Pakistan. Participants belonging to private institutions were found to be more involved in research than those belonging to public institutions.

Involvement in research helps them develop and spruce other personality skills, such as communication skills, thinking out of box and time management. Harrison proved that empirical research projects which increase human subject interaction with the medical students, help them become independent learners, critical evaluators and groom their communication skills. Similar, perspectives were advocated by Supino PG et al.<sup>20,21</sup> In Karachi, research is being inducted into the curriculum but only to be manipulated by untrained mentors with no formal research training or even informal experience.<sup>22</sup> Their students have to look towards other passive means of learning. If these students are trained under expert supervision, they would make better physicians rather than thoughtless prescription writers.

This study also highlights the keen interest of the undergraduates and fresh graduates with 57(32%) final year students and 20(20%) interns who would like to publish. Age, gender and presence of doctors in the family were not found to be statistically significant factors related to a respondent's interest or involvement in research. Factors influencing these interests are similar to other studies. Self motivation or forced due to programme design both have their impact. Although our students understood the importance of research publications but few were self motivated. A substantial number reported as research to be a compulsory part of their programme requirements. Both locally and internationally, mandatory involvement of students has productive outcomes.<sup>23,24</sup> This was evident from the study when only a few participants could correctly count the Medline indexed journals of Pakistan. Even less were able to name them correctly, reflecting on the severe lack of self motivation towards reading practices. Family members from the same field cannot create or promote concern to publish or otherwise. Majority of the students' time is spent at their institution which holds more magnitude in their decision making abilities. Currently locally, the private sector medical colleges and

hospitals emphasizes on research and publications, with a few state owned institutes following the lead. Internationally, also the depth of research teaching varies in many ways.<sup>25</sup> The participants' interest is seen more in general topics of their specialties as most are reluctant to study and write on medical education and medical ethics related topics. Unfortunately, these two sub-specialties are the ones that need most attention in any developing country and provide the foundations of good medical professionalism.<sup>26</sup>

Understanding as to where most research is being conducted, why and of what quality we can note that though, it is difficult to quantify the effect of physicians' research interests on their practices, but many agree that physicians' having research themes can improve primary health care delivery, clinical understanding of diseases and healthcare services can progress many folds.<sup>3,16</sup> Our participants emphasized the increasing trend of research once they are focused towards a clinical specialty like medicine or surgery. Others have found that starting research earlier encourages medical students in making critical career decisions.<sup>27</sup> The nature and type of institute and its attitude towards research influences most on one's practices. Specialty of interest was also found to be a statistically significant predictor of reading habits. Much is evident from our study and also noted in institutes worldwide. Any university's interest in research can be judged by the options it gives its students to explore their research interests. However, some suggest that by judging medical schools by different disciplines, peer groups and journal information might provide more information about these institutes' research productivity than simple bibliometric statistics.<sup>11</sup> In reality, physicians assume that since there is more accountability and the promotion checklist has research as a 'need' in private sector institutions their students and residents publishing more are not particularly unexpected. The drive to get promotions makes the consultants do research and they in turn use the medical student's for the cumbersome portions of the projects. Even in the public sector universities, PMDC and HEC have similar promotion rules. However, due to long review periods most consultants do away without publishing. The trends are now improving as evident from increasing number of physicians being promoted to Professors, Associate and Assistant Professors.<sup>6,7</sup>

### Conclusions

There is keen interest and involvement in research, among final year medical students and fresh graduates of Karachi, Pakistan. However, the factors driving them are based on their university's encouragement towards research and future plans regarding clinical field of interest.

### Resource Requirements and Conflict of Interest:

This study is self-funded by the authors and no

financial aid has been asked for conducting the study. We have no conflict of interest towards any of the institutes or their pupils. Our sole aim is to improve and promote good research among students.

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