ORIGINAL ARTICLE

REHMAN MEDICAL COLLEGE ADMISSION CRITERIA AS AN INDICATOR OF STUDENTS' PERFORMANCE IN UNIVERSITY PROFESSIONAL EXAMINATIONS

Tariq Saeed Mufti, *Kifayatullah, **Iftikhar Qayum

Principal, *Department of Community Health Sciences, **Department of Medical Research, Rehman Medical College, Hayatabad, Peshawar, Pakistan

Background: Although admission criteria are standardized by Pakistan Medical & Dental Council (PM&DC), medical colleges can conduct aptitude tests as admission criteria. The present study aimed to determine the correlation of Rehman Medical College's (RMC) admission criteria with students' academic performance in the Khyber Medical University (KMU) First Professional Part-1 examinations. **Methods:** A descriptive study was done at RMC from December 2012 to March 2013 based on computerized records of first and second year MBBS students (years 2010 and 2011; 100 students per year). Students who dropped out or were stricken off from RMC before the university exam were excluded. Pearson's correlation coefficient was calculated by using SPSS-15. **Results:** For 2010, highest correlation was observed between combined marks of all admission criteria components and KMU professional examination (r=0.466, p<0.001) followed by RMC aptitude test (r=0.424, p<0.001). For females, combined marks of admission criteria showed highest correlation (r=0.629, p<0.001) while RMC aptitude test showed highest correlation for male students (r=0.361, p=0.004). For 2011, combined marks of admission criteria (r=0.359, p=0.001) showed the highest correlation with KMU professional examination marks followed by Educational Testing & Evaluation Agency (ETEA) marks (r=0.327, p=0.002). ETEA marks showed highest correlation for females (r=0.491, p=0.001) followed by combined marks of admission criteria (r=0.432, p=0.005); for males, combined marks of admission criteria (r=0.385, p=0.006) showed highest correlation followed by ETEA marks (r=0.383, p=0.007). **Conclusion:** Combined marks of admission criteria correlate with students' academic performances in university professional examination result.

Key words: Association, admission criteria, students, education, medical prediction

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INTRODUCTION

Admission to medical school is highly competitive and generally based on a combination of academic achievements, written tests and an interview.[1]

Entry in a medical college is a dream for the students throughout Pakistan. Limited slots are available for which thousands of applicants compete. After a process of scrutiny admissions are offered to candidates. Secondary School Certificate (SSC), Higher Secondary School Certificate (HSSC) or equivalent and Education Testing & Evaluation Agency (ETEA) marks in combination are used as admission criteria. The purpose of administering an entrance/admission test for admitting students to medical colleges is to select the more appropriate candidates who can pursue career in medicine. These candidates should be bright, empathetic, committed, humane and willing to communicate in the best possible way, as they have to be five star doctors in the future.[2] Some universities and colleges also arrange their own entry tests and interviews with the combination of SSC, HSSC and ETEA test marks.[3] The components of Rehman Medical College (RMC) Peshawar admission criteria are SSC marks, HSSC marks, ETEA test marks and RMC's aptitude test marks.

Some previous studies show the relation of the entry test criteria with MBBS professional examination marks. According to Baig LA, the SSC exam was not positively related to the academic performance.[2] The same results were also observed in previous studies done internationally.[4] In Pakistan the available studies have found no significant relationship between the overall scores for selection with the performance in professional examinations. However, significant correlation was found between 1st, 2nd and 3rd MBBS professional examinations.[2,5] In the UK as early as 1982, little evidence was found pertaining to high A level grades indicating an increased likelihood of success at a preclinical or clinical course or an increased competence or ability in actual practice of medicine.[6]

In Pakistan the Medical Education is going through a rapidly evolving phase however numbers of deficiencies have to be addressed. In order to improve the quality of medical education further research is required in the process of admission, teaching methodologies, and assessments. However there are few studies available in Pakistan regarding medical education in this respect.

The admission criteria in Pakistan which is widely used in various universities are SSC, HSSC and university entry test marks. The question remains whether these are good enough criteria for admission in MBBS or is there room for improvement?

This study attempts to look for improvements in the admission criteria for selection of MBBS students by correlating combined/individual components of the National and RMC Admission Criteria with students' academic performance in Khyber Medical University (KMU) Peshawar First Professional Part-1 examinations.

MATERIAL AND METHODS

A descriptive study was done from December 2012 to March 2013 on first and second year students of Rehman Medical College admitted in the years 2010 and 2011. All the 200 students were selected. Students who dropped out and those who were stricken off before appearing in KMU First Professional Part-1 examinations were excluded.

Prior approval was obtained from the RMC Institutional Research Ethics Board (IREB) for data collection and conducting the research study. The academic records i.e. SSC marks, HSSC marks, ETEA marks, RMC aptitude test marks (RMCET) and KMU annual examination marks of these students were collected from the computerized database maintained by the RMC Student Affairs section. In addition to data of the variables mentioned above, combined marks of SSC, HSSC, ETEA and RMCET were also included as a variable.

Data were entered and analyzed by SPSS-15. Pearson's correlation coefficient was calculated between the SSC marks, HSSC marks, ETEA marks, RMC aptitude test marks, combined marks of admission criteria and KMU annual examination marks for all students of years 2010 and 2011; data analysis and correlation were also done based on students' genders. A $p \leq 0.05$ denoted significant correlations.

RESULT

Data were available for 188/200 (94%) students (First year = 99, Second year = 89) which represented all the successful students of first year MBBS and second year MBBS in KMU First Professional Part-1examinations 2011 and 2012 respectively.

For students admitted in 2010, correlation between combined marks of admission criteria and KMU professional examination was the highest (r=0.466, $p<0.001$, Table-1) followed by RMC aptitude test (r=0.424, $p<0.001$, Table-1); combined marks of admission criteria had highest correlation with university professional examination for both male (r=0.366, $p=0.007$, Table-2) and female students (r=0.629, $p<0.001$, Table-2) followed by RMC aptitude test (males, r=0.361, $p=0.004$, females, r=0.557, $p=0.001$, Table-2).

For students admitted in 2011, combined marks of admission criteria showed the highest correlation (r=0.359, $p=0.001$, Table 3) with university final examination marks followed by ETEA marks (r=0.327, $p=0.002$, Table-3). ETEA marks correlated the highest with university professional examination for female students (r=0.491, $p=0.001$, Table-4) followed by combined marks (r=0.432, p=0.005, Table-4); for male students, combined marks showed highest correlation(r=0.385, $p=0.006$, Table-4) followed by ETEA marks (r=0.383, $p=0.007$, Table-4).

Table-1: **Correlation values for first year MBBS students (class of 2010, n=99)**.

X axis variable	Y axis variable	r	r^2	*p*-value of r
SSC	KMU	0.373	0.139	<0.001
HSSC	KMU	0.370	0.137	<0.001
ETEA	KMU	0.305	0.093	0.005
RMC aptitude test	KMU	0.424	0.180	<0.001
Combined marks of admission criteria	KMU	0.466	0.217	<0.001

Table-2: **Correlation values for female and male students of first year MBBS (Class 2010, n=99)**

X axis variable	Y axis variable	Female students (n=37)			Male students (n=62)		
		r	r^2	*p*-value of r	r	r^2	*p*-value of r
SSC	KMU	0.373	0.139	0.023	0.352	0.124	0.005
HSSC	KMU	0.547	0.299	<0.001	0.239	0.057	0.061
ETEA	KMU	0.430	0.185	0.014	0.235	0.055	0.090
RMC aptitude test	KMU	0.557	0.31	0.001	0.361	0.130	0.004
Combined marks of admission criteria	KMU	0.629	0.396	<0.001	0.366	0.134	0.007

Table-3: **Correlation values for second year MBBS students (class of 2011, n=89)**

X axis variable	Y axis variable	R	r^2	*p*-value of r
SSC	KMU	0.159	0.025	0.137
HSSC	KMU	0.207	0.043	0.052
ETEA	KMU	0.327	0.107	0.002
RMC aptitude test	KMU	0.104	0.011	0.330
Combined marks of admission criteria	KMU	0.359	0.129	0.001

Table-4: **Correlation values for female and male students of second year MBBS (Class 2011, n=89)**

X axis variable	Y axis variable	Female students (n=40)			Male students (n=49)		
		R	r^2	*p*-value of r	R	r^2	*p*-value of r
SSC	KMU	0.048	0.002	0.769	0.124	0.015	0.397
HSSC	KMU	0.094	0.009	0.564	0.172	0.03	0.237
ETEA	KMU	0.491	0.241	0.001	0.383	0.147	0.007
RMC aptitude test	KMU	0.257	0.066	0.110	0.132	0.018	0.364
Combined marks of admission criteria	KMU	0.432	0.187	0.005	0.385	0.148	0.006

DISCUSSION

The previous studies done in Pakistan[2,3] show no positive correlation between SSC and university professional examination while our study shows positive correlation between SSC and university professional examination marks for the students admitted in 2010 (r=0.373, *p*=<0.001, Table-1). For the students admitted in 2011 there was no significant correlation between SSC and university professional examination, however our study is limited just to first professional university examination. In Pakistan the studies by Huda *et al* and Baig found no significant relationship between the overall scores for selection with the performance in professional examinations.[2,3]

In our study the HSSC marks for students admitted in 2010 are significantly positively related to university professional examination marks (r=0.370, *p*=<0.001, Table-1) and show positive correlation near to significance for students admitted in 2011 (r=0.207, *p*=0.052, Table-2). McManus K. in his study (UK) positively correlated A grade marks with university professional examination.[6] A recent study from Pakistan by Bhatti *et al*[7] concluded from performance of first and second year MBBS examinations that HSSC marks are of prime importance and the best predictor for merit admission to medical college.

The ETEA marks also have positive correlation with the university professional examination in our study (r=0.305, r^2=0.093, *p*=0.005, Table 1) for students admitted in 2010, and for students admitted in 2011 (r=0.327, r^2=0.107, *p*=0.002, Table-3). This is the first reported study where ETEA marks have been studied for correlation with University Professional Examination performance in available literature in Pakistan.

RMC aptitude test has the highest positive correlation (r=0.424, *p*= <0.001, Table-1) among all the individual components of admission criteria for the students admitted in 2010; however it showed weak and non-significant correlation in the students of 2011(Table-3).

When the marks of all the components of the admission criteria (SSC, HSSC, ETEA, RMC aptitude test) were combined and correlated with university professional examination, the highest positive correlation was obtained for students admitted in 2010 (r=0.466, *p*=<0.001, Table-1) and also for students of 2011 (r=0.359, *p*=0.001, Table-3).

Gender analysis showed that combined marks of admission criteria have the highest correlations with KMU Professional examination marks for both years, except for female students of 2011 where ETEA marks showed higher correlation (Tables-2 & 4).

In this study there are weak correlations between SSC, HSSC, ETEA and RMC aptitude test with university professional examination marks. This is most probably due to lack of medical related content in the curriculum of SSC and HSSC. In the study done by Huda *et al* there is significant correlation between 1st, 2nd and 3rd professional examinations as all the three professional examinations include medical related contents.[3]

Despite moderate correlational values, there are clear and significant correlations between at least two criteria, namely the combined marks of admission criteria and the ETEA test. A study by Luqman[8] from Foundation University Rawalpindi Pakistan in 2011 also shows moderate levels of correlation between students' pre-admission scores and examination performance; the author recommends that combination of pre-admission criteria would be a better predictor of examination performance.

Even though different medical colleges have different admission criteria, some level of association is obtained between pre-admission criteria and student performances based on studies from Saudi Arabia,[9] Croatia[10] and Australia.[11]

Although this is a relatively small scale and preliminary study, the correlations obtained appear plausible, as pooled averages of previous performances provide more robust statistical grounds for associations. Moreover the ETEA test is a standard policy set by the PM&DC and perhaps has merit. As there are few studies available regarding this area, we hope our study will motivate researchers to plan further studies to improve admission criteria.

The sample size of our study and as it is done only a single medical college may not be the true representative of the actual picture and the results may not be generalized, however it is just a preliminary report and the study will continue for upcoming several years. Large scale studies conducted at the University or PM&DC levels would be of great help in clarifying the standards and eligibility criteria for medical college admissions in the country.

CONCLUSION

Combining the marks of all the components of admission criteria provide grounds for significant associations for student performance in university professional examinations. ETEA and RMC aptitude test marks also deserve merit.

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Address for Correspondence:

Dr. Tariq Saeed Mufti, House No. 77, Street-11, Jinnahabad, Abbottabad, Pakistan.
Cell: +92-300-8111579
Email: muftitariq@hotmail.com