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## Evaluation of the academic achievement of rural versus urban undergraduate medical students in pharmacology examinations

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## ABSTRACT

**Objective:** To compare the academic performance of urban and rural students in pharmacology examinations.**Methods:** It was a comparative study of the academic performance of urban and rural students in pharmacology examinations of the sessions 2014 and 2015. For evaluating the students' academic performance, urban and rural students were divided into four groups: Group 1: who got <50% marks in exams; Group 2: who scored between 50% and 69% marks; Group 3: who scored between 70% and 79% marks; Group 4: who got ≥80% marks.**Results:** When the academic performance of the urban and rural students was compared; significant difference was found with *P*-value 0.038. Additional comparison revealed insignificant difference in multiple choice questions (MCQs) with *P*-value 0.152 while significant difference was established in short essay questions (SEQs) with *P*-value 0.043.**Conclusion:** The results of the present study showed significant difference between the academic performance of urban and rural students.

## 1. Introduction

There is consensus that children's education is one of the key vehicles engendering the development of economies [1]. However, in developing countries the distribution of resources and its consequent effects on rural-urban student performance has remained a grave issue especially in human sciences than physical sciences [2,3]. Despite a rising focus by governments to target rural areas for special assistance, rural-urban disparities in academic performance are still an unresolved problem [2].

A general perception of the comparative inferiority of rural students has prevailed for quite some time. This view implies not only to differences in the academic performance of rural and urban students but also too many other socially desirable outcomes like aspiration, intelligence and aptitude [4]. The concern regarding the academic performance of rural and urban students is not limited to one country but rather it seems to be a global issue [5]. The question whether real educational differences

exist between rural and urban students has been a topic of debate since very long time [6]. Recent educational research has established certain differences in the achievements of rural and urban students and also in their higher education successes [4].

Along with other factors, such as availability of technology, resources and quality of teachers, the geographic location plays a very important role in the grooming, motivation and academic performance of the students [7]. A series of studies have suggested the importance of initial schooling and residential environment on the personality and behavior of an individual [8]. Previously a significant difference was found between the academic performance of rural and urban students. But now with the advancement of the technology this difference seems to be vanishing.

Previous studies have shown that performance of rural students with their urban counterparts showed mixed fashion in results [9]. Felder et al. found that urban students did better in an introductory course than the rural students [10]. Xiato along with his colleagues and Hobbs reported that rural students perform as well as their urban counterparts [6,11].

The rationale of the present study is to somewhat resolve the conflict of better academic performance among rural and urban students. Outcome of the study may form the basis for paying

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much attention and doing more hard work with the weak group in order to improve their academic performance. The study may be helpful for college's policy makers to design and implement the policies to improve the students' performance of the weaker group.

## 2. Material and methods

It was a comparative study and carried out at Rehman Medical College, Peshawar, after the approval of the ethical committee of Rehman Medical Institute, Peshawar. The confidentiality of the students was maintained as the names of the students were not disclosed. The consent from the students was taken. 200 year 03 MBBS students of the sessions 2014 and 2015 were included in the study by universal sampling technique. The course contents included general pharmacology, autonomic nervous system, cardiovascular system, central nervous system, gastrointestinal tract, blood, autacoids, respiratory system, endocrine system and chemotherapeutic agents. All the pharmacology examinations of year 03 MBBS were evaluated and compared on the basis of previous records of fortnightly, end of module, midterm and end of session examinations. The written theory paper consisted of two components: part-I Multiple Choice Questions (MCQs); single best answer type and part-2; Short Essay Questions (SEQs). Structured key was

provided to the examiners in order to eliminate the bias when the papers were evaluated.

For evaluating the academic performance of rural and urban students, they were divided into 4 groups: Group 1: who got <50% marks in exams; Group 2: who scored between 50% and 69% marks; Group 3: who scored between 70% and 79% marks; Group 4: who got  $\geq 80\%$  marks.

Statistical analysis: The data were entered and analyzed by using SPSS 20.0. Data for MCQs and SEQs marks was described by using mean, SD, median, IQR, frequency and percentages. Three ways ANOVA was used to see for any interaction effect of gender, residential status and attendance on exam performance but was found to be insignificant. Then the only main effects were compared by using Mann Whitney U test. Tukey's test was used for *post hoc* analysis. Chi-square analysis was used to see any difference among marks categories for locality. *P*-value of  $\leq 0.05$  was considered significantly different.

## 3. Results

Total 200 MBBS students of the sessions 2014 and 2015 were enrolled in the study. When the academic performance of the rural and urban students was compared; significant difference was found with *P*-value 0.038. When further comparison was done; insignificant difference was found in MCQs with *P*-value 0.152 while significant difference existed in SEQs with *P*-value 0.043 (Table 1). In MCQs, 22.9% urban students scored <50% marks, 60% were found in the range of 50%–69%, 16.0% got marks between 70% and 79% and 1.1 scored  $\geq 80\%$  marks. The distribution of urban students according to the categories of marks in SEQs is as follows; 30.3% in <50%, 41.1% in 50%–69%, 20.6% in 70%–79% and 8.0% in  $\geq 80\%$ . Similarly in MCQs, 8.0% rural students scored <50% marks, 68.0% were found in the range of 50%–69%, 24.0% got marks between 70% and 79% and none of the students scored  $\geq 80\%$  marks. The distribution of rural students according to the categories of marks in SEQs is as follows; 16.0% in <50%, 32.0% in 50%–69%, 36.0% in 70%–79% and 16.0% in  $\geq 80\%$  (Figure 1).

When pair wise comparison was made between the groups; the difference was significant for only two groups. The rural students with marks  $\geq 80\%$  were with significantly higher ratio as compared to group with marks <50% with *P*-value 0.017 (Table 2).

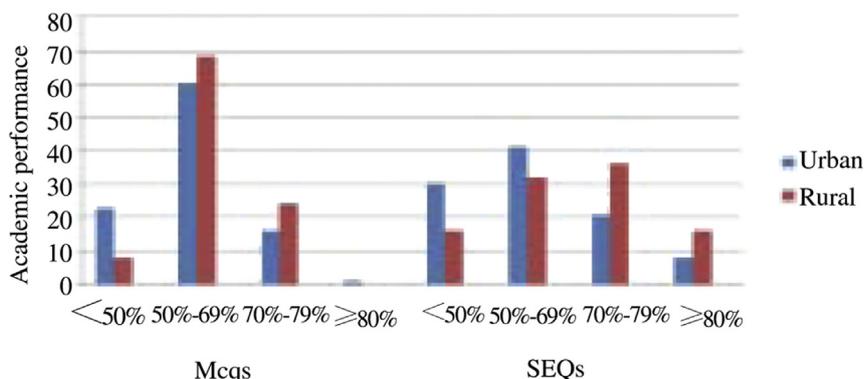
The effect of attendance on the academic performance of the rural and urban students was evaluated; result was found to be insignificant with *P*-value 0.496 (Table 3). Similarly the effect of

**Table 1**

Comparison of academic performance of rural and urban students in MCQs & SEQs examination.

Academic performance		Area		<i>P</i> -value
		Rural	Urban	
% MCQs	Mean	61.6	56.9	0.152
	SD	10.0	13.6	
	Median	63.0	58.0	
	Q1	53.0	50.0	
	Q3	68.0	68.0	
%SEQs	Mean	63.8	55.0	0.043*
	SD	18.6	19.9	
	Median	70.0	55.0	
	Q1	50.0	40.0	
	Q3	78.0	70.0	
Overall total	Mean	63.0	55.7	0.038*
	SD	13.4	15.9	
	Median	64.3	56.4	
	Q1	51.8	44.6	
	Q3	73.8	70.9	

\* = *P*-value  $\leq 0.05$ .



**Figure 1.** Comparison of the academic performance of rural and urban students in MCQs & SEQs exams.

**Table 2**

Comparison between different categories of marks percent for rural and urban students.

Students	Marks	P-value
<50%	50%–69%	0.061
	70%–79%	0.140
	≥80%	0.017*
50%–69%	70%–79%	0.770
70%–79%	≥80%	0.168
	≥80%	0.105

\* = P-value ≤ 0.05.

**Table 3**

Effect of attendance on academic performance of rural and urban students.

Academic performance	Attendance (%)		P-value
	Rural	Urban	
Mean	81.0	83.4	0.372
SD	14.4	12.9	
Median	84.0	85.0	
Q1	76.0	78.0	
Q3	93.0	93.0	

residential status (boarder, day scholar) and gender was also proven to be insignificant.

#### 4. Discussion

Recent educational research has examined rural and urban differences in their achievement. Usually it is believed that students from rural schools mostly receive an education that is inferior compared to the students that live in urban areas. Because urban students are provided with better quality in education, availability of the information that they get from various sources like electronic media and mass media, their educated families and peers groups which also help them for better performance. They have many facilities and advantages in their education compared to rural students. Students in rural areas are less exposed to the outside world and also there is lack of knowledge about the current issues that happen [12].

In the present study the academic performance of the rural and urban students was compared; significant difference was found between the academic performances of the two study groups. Additional comparison revealed insignificant difference in MCQs but significant difference was established in SEQs.

Adepoju and Oluchukwu conducted a study in Oyo state of Nigeria from 2005 to 2007. They collected the relevant data from ten different educational institutes of rural and urban areas and compared the academic records. The result revealed the marked difference between the academic performance between the students of the two localities; with remarkable mean scores obtained by urban area students than rural students [13]. Similarly another study was undertaken in Pakistan to evaluate the comparative academic performance of rural and urban students at undergraduate level. Result showed that overall performance of urban students was better than rural ones [14]. Owoye and Joseph also favored the urban area students for performing well [8]. Similar results were found by another study in which 200 rural and 200 urban students of Varanasi district, India were compared randomly for academics [15].

Worley et al. showed that academic performance of the rural students of Flinders University was significantly better than that of their urban colleagues [16]. A study in Taiwan also showed the same results when the academic achievements of rural and urban students were compared [17]. Gakhar and Asema found that rural students appreciably achieved better in their annual examinations than their urban counterparts [18]. Pande, in another study, revealed the same results where rural students have shown better performance as compared to their urban classmates [5].

Xitao and his colleagues conducted a study in order to investigate the differences between the academic performance of rural and urban students. They found no significant difference academically when the results of the two groups were compared [6]. Bosede and Emiloju performed a study; they compared the results of the examination to measure the academic performance of rural and urban students. The performance of both the group of students was found almost equal [19]. Similar results were found by other researchers [20–25].

The probable explanation for the results of the present study is that now a days government is facilitating the rural areas with needed resources. Another possible reason could be due to the availability of electronic media and especially internet in rural environment too, the gap of exposure existing previously to the external environment is reduced. The rural communities now know the importance of having good education.

In conclusion, assessment of the results showed significant difference between the academic performance of rural and urban students, clearly indicating the significant effect of locality on the academic performance of the students. On the basis of the results it is further concluded that attendance plays no notable role in the academic performance.

#### Conflict of interest statement

We declare that we have no conflict of interest.

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