



Effect of the schooling system and tuition fees on academic performance of medical college students

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ABSTRACT

Objective: The objective of this study was to determine the effects of the two education systems (General Certificate of Education [GCE] and Pakistani Secondary Education [PSE] system) using academic performance of medical students. **Methodology:** A cross-sectional study was conducted in four medical colleges of Karachi from May 2012 to August 2012. Nine hundred questionnaires were distributed among the students and eight hundred and sixty-three duly filled questionnaires were returned. **Results:** Of 863 respondents, 175 (20.3%) respondents were males. On average, matriculation students paid Rs 1746 (± 1570) (US\$ 17.46 [± 15.70]) per month for tuition and Rs 1725 (± 1674) (US\$ 17.25 [± 16.74]) per month for the extra coaching, whereas O-level students paid on average of Rs 5438 (± 493) (US\$ 54.38 [± 4.93]) per month for tuition and Rs 3,756 (± 2749) (US\$ 37.56 [± 27.49]) per month for extra coaching. On average, intermediate students spent Rs 1,180 (± 209) (US\$ 11.80 [± 2.09]) per month for tuition and Rs 1631 (± 264) (US\$ 16.31 [± 2.64]) per month for extra coaching, while A-level students paid Rs 9903 (± 918) (US\$ 99.03 [± 9.18]) per month for tuition and Rs 3708 (± 793) (US\$ 37.08 [± 7.93]) per month for extra coaching. For further analysis, the students were categorized into three groups as: Group A: Matriculation and intermediate, Group B: O-level and intermediate, Group C: O-level and A-level. The mean grade point average of the three groups: Group A, Group B, and Group C were 3.18 (± 0.43), 3.20 (± 0.49) and 3.21 (± 0.54), respectively. The differences were statistically insignificant. **Conclusion:** This study concludes that the students who qualify their secondary education through GCE system; spend one extra year of schooling, pay many times more tuition and extra-coaching fee and send some foreign exchange overseas for registration and examination, gain very insignificant amount of academic achievement when compared to the students who qualify through secondary education system of PSE.

KEY WORDS: General certificate of education, grade point average, Pakistan secondary education system, medical students

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INTRODUCTION

Pakistan's official system of education is categorized into 5 levels: Primary (grade 1-5), Middle (grade 6-8), High level (Grade 9 and 10/Matric) also called Secondary School Certificate (SSC) system, Intermediate level (grade 11 and 12) also called Higher Secondary Certificate (HSC) system and University level (for undergraduate, and post-graduate degrees). At secondary level there are two parallel system of education: (1) Pakistani Secondary Education (PSE) system, including (a) SSC and (b) HSC, and (2) General Certificate of Education (GCE) System, also known as British Education System include (a) ordinary level (GCE O-level) and (b) advanced level (GCE A-level). There are three examining boards for GCE system: (1) University of Cambridge Local examination (UCLES) and (2) Edexcel International London Examination (EILE) and (3) University of Oxford Delegacy of Local examinations

(UODLE). Both systems are creating discrimination in pupils qualifying from them in terms of curriculum, ambiance, facilities, pay scales and financial status of students [1]. Therefore, it is an interesting debatable topic to compare the two systems at tertiary level. GCE system is favoured over local system by many researchers [2,3]; however the belief is not fully justified, and requires reconsidering and scrutinizing, as there may be little difference between two categories and it may not be as significant as it is assumed [4]. Whether there exists a significant difference in capability and aptitude of students of two systems remains a controversy, however the margin of tuition and extra-coaching fees between the two systems varies so widely that GCE system confines itself only to upper and higher class of population and is not within affording capacity of general population. Therefore, there is a need to explore further for the effect of GCE system over the local system for university level education. Few studies have been conducted

in Pakistan to compare GCE system with PSE system among non-medical students. However, as far as authors' knowledge is concerned no study has been conducted on medical students to compare the effect of these two systems of education on their academic grades.

To answer this question, a survey was conducted among medical students of Karachi to evaluate if students qualifying from GCE system differ significantly from local system in their scores. The objective of the study was to determine the correlation of the two education systems with academic performances of medical students. In addition, the study also explored the level of satisfaction of those students with their previous education system.

METHODOLOGY

Study area: Four medical colleges of Karachi, namely: Dow Medical College, Sindh Medical College, Liaquat National Medical College and Bahria Medical College. The first two are public institutions, while the remaining two are privately administered.

Study design: Cross-sectional

Sampling: Convenient Sampling

Sample size: The sample size of 568 was computed using prevalence of acceptability of 69% of GCE system as compared to PSE system [5] with the maximum error of $\pm 1\%$ in the estimate.

Study population: 3rd, 4th and final year medical students of Karachi

Inclusion Criteria

All the 3rd, 4th and final year students of the selected medical colleges who were present in the classroom.

Exclusion Criteria

The students who refused to give informed consent. Students of 1st and 2nd year, because it is too early to detect any reasonable impact of the background of education systems in the academic performance until 3rd year.

Data Collection Tool

Questionnaire containing demographic information, college name, high-school examination (matric/O-level), college examination (intermediate/A-level), type of institution (private/government) and fees paid for tuition and extra coaching in high-school and college, parents' education, number of siblings and birth order, family income, effectiveness of high-school and college education system and grade point average (GPA) by semester wise.

Data Collection

Permission was taken from the institutions through the proper channel of the principal's office. All the four co-investigators with other data collectors whose names are mentioned in the acknowledgement, visited the study institutions to gather the information. The students were approached during the lecture sessions with the permission of the administration and teacher. Nine hundred questionnaires were distributed among the students of the 3 classes of the 4 medical colleges mentioned above. The study was explained to them and they were invited to participate in the study. The informed consent paragraph was also given in the questionnaire. Eight hundred sixty three duly filled questionnaires were received.

Data Analysis

Data were analyzed through SPSS version 17.0. One-way ANOVA and t-test were employed to determine the difference between the groups. Tukey's *post-hoc* test was used to determine the pair-wise differences if the ANOVA showed a significant difference. Chi-square test was used to determine the association between categorical attributes. Significant level of 5% was set for test statistics.

Ethical Consideration

The study was approved by the Institutional Review Board of the Dow University of Health Sciences, Karachi.

RESULTS

The questionnaires collected from Dow Medical College, Sindh Medical College, Liaquat National Medical College and Bahria Medical College were 439 (52.3%), 242 (28.8%), 90 (9.4) and 92 (9.5), respectively [Figure 1]. The proportion of respondents from government and private medical institutions

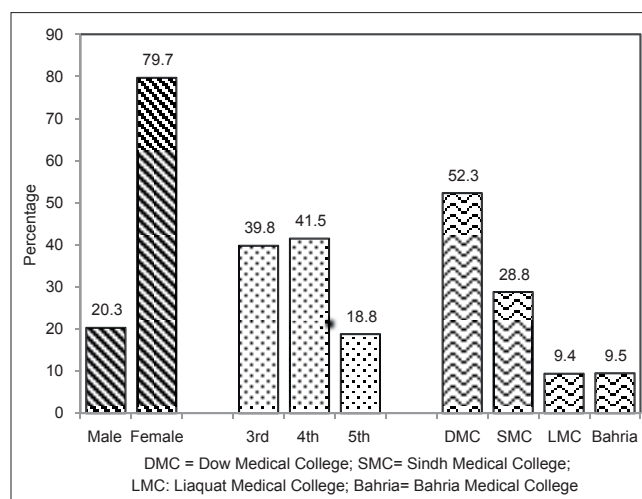


Figure 1: Gender, professional year and college of the respondents, DMC: Dow medical college, SMC: Sindh medical college, LMC: Liaquat medical college, Bahria: Bahria medical college

was 79% and 21%, respectively. Of 863 respondents, 175 (20.3%) respondents were males, which made male to female ratio of about 1:4 [Figure 1]. The students belonging to 3rd, 4th and final year were 332 (39.8%), 358 (41.5%) and 164 (18.8%) respectively [Figure 1]. The mean age of students was 21.5 ± 1.1 years. For analysis purposes, participants were divided into three groups, namely:

- Group A: PSE system students (Matriculation and Intermediate passed)
- Group B: Mixed system students (O-level and Intermediate passed) and
- Group C: GCE system students (O-level and A-level passed).

The percentage of the respondents belonging to these groups was 84.8%, 8.6% and 6.6%, respectively [Figure 2].

Table 1 shows the tuition fee structure of the respondents during their matriculation/O-level and intermediate/A-level education years. About 87% of the medical students, who passed the matriculation examination, paid less than Rs 2,500/- (US\$ 25) per month for tuition fee, while only 22.3% of the medical students, who did the O-level, paid less than Rs 2,500/- (US\$ 25) per month. On average, matriculation students paid Rs 1746 (±1570) (US\$ 17.46 [±15.70]) per month, while O-level students paid on average of Rs 5438 (±493) (US\$ 54.38[±4.93]) per month. The difference was statistically significant ($P < 0.0001$). Considering the tuition fee structure of intermediate/A-level, table shows that 66.5% of the students who passed intermediate examination paid less than Rs 1,000/- (US\$ 10.0) per month, while only 5.9% of the A-level students paid the tuition fee in this range. On average, intermediate students spent Rs 1,180 (±209) (US\$ 11.80 [±2.09]) per month for the

tuition fee, while A-level students paid Rs 9903 (±918) [US\$ 99.03(±9.18)] per month for the same. The difference was highly significant ($P < 0.0001$).

Table 2 shows the extra coaching fee students paid during their matriculation/O-level and Intermediate/A-level. Fifty-five percent of matriculation students did not take any extra coaching while 62% of O-level indicated the same. Forty percent of the matriculation students spent less than Rs 2,500/- (US\$ 25.0) per month for extra coaching, while only 19% of the O-level students paid for extra coaching in this range. On average, matriculation students who have taken extra coaching, paid Rs1725 (±1674) (US\$ 17.25 [±16.74]) per month, while O-level students, who have taken extra coaching, paid on average of Rs3756 (±2749) (US\$ 37.56 [±27.49]) per month. The difference was statistically significant ($P = 0.008$). Comparing the extra coaching fee of intermediate and A-level, the study revealed that half of the A-level did not take extra coaching while about quarter of the intermediate students did the same. Seventy-eight percent of the intermediate students paid under Rs 2,500/- (US\$ 25.0) per month, while only 30% of the A-level students spent for extra coaching under this range. Considering the mean coaching fee of the students who took the extra coaching, the results showed that the intermediate student paid Rs 1631 [±264] (US\$ 16.31 [±2.64]) per month, while A-level students spent Rs 3708 (±793) [US\$ 37.08 [±7.93]] per month. The difference was statistically significant ($P = 0.048$).

Table 3 shows the extra-coaching practice of three groups of students (matriculation and intermediate, O-level and intermediate, O-level and A-level). During the high school education about half of the students did not take any extra-

Table 1: Comparison of tuition fees of matriculation, O-level, intermediate and A-level students

	<1,000	1,001-2,500	2,501-5,000	5,001-7,500	7,501-10000	>10,000	P value for frequencies	n	Mean (±SD)	P value for means
Matriculation	260 (39.5)	317 (47.9)	68 (10.3)	8 (1.2)	7 (1.1)	2 (0.3)	<0.0001	662	1746 (±1572)	<0.0001
O-level	5 (4.8)	18 (17.5)	41 (39.8)	20 (19.4)	12 (11.7)	7 (6.8)		103	5438 (±4927)	
Intermediate	475 (66.5)	128 (18.0)	86 (12.1)	12 (1.7)	5 (0.7)	7 (1.0)	<0.0001	713	1180 (±2088)	<0.0001
A-level	3 (5.9)	7 (13.7)	5 (9.8)	6 (11.8)	17 (33.3)	7 (21.6)		45	9903 (±9188)	

SD: Standard deviation

Table 2: Comparison of extra coaching fee of Matriculation, O-level, Intermediate and A-Level students

	No coaching	<1,000	1,001-2,500	2,501-5,000	5,001-7,500	7,501-10000	>10000	P value for frequencies	n	Mean (±SD)	P value for means
Matriculation	364 (54.5)	183 (27.4)	88 (13.2)	28 (4.2)	0 (0.0)	2 (0.3)	3 (0.4)	<0.0001	668	1772 (±4843)	0.008
O-level	72 (62.1)	6 (5.2)	16 (13.8)	12 (10.3)	4 (3.4)	6 (5.2)	0 (0.0)		116	3756 (±2749)	
Intermediate	171 (23.8)	185 (33.9)	241 (44.1)	98 (17.9)	9 (1.6)	7 (1.3)	6 (1.1)	<0.0001	717	2142 (±2828)	0.007
A-level	30 (50.0)	2 (6.7)	7 (23.3)	9 (30.0)	5 (16.7)	3 (10.0)	4 (13.3)		60	7415 (±9978)	

SD: Standard deviation

Table 3: Extra-coaching fee in during school and colleges years

Groups	Extra coaching during school time				Extra coaching during college time				Total
	Always	Sometimes	Never	P value	Always	Sometimes	Never	P value	
Matriculation and intermediate	73 (10.3)	270 (37.9)	369 (51.8)	0.454	430 (60.2)	133 (18.6)	151 (21.1)	<0.0001	714
O-level and intermediate	3 (4.1)	30 (41.1)	40 (54.8)		24 (33.3)	21 (29.2)	27 (37.5)		72
O-level and A-level	4 (6.6)	23 (37.7)	34 (55.7)		6 (9.8)	24 (39.3)	31 (50.8)		61
Total	80 (9.5)	323 (38.2)	443 (52.4)		460 (54.3)	178 (21.0)	209 (24.7)		847

coaching in all the three groups and the percentages among these groups were insignificantly different ($P = 0.454$). However, during the college time, 60.2% of the group 1 (matriculation and intermediate) always needed extra-coaching, while 33.3% of the group 2 (O-level and intermediate) and only 9.8% of the group 3 (O-level and A-level) always needed extra-coaching. Statistically, these percentages were highly significantly different ($P < 0.0001$).

Table 4 illustrates the academic performance of the respondents. Percentage of students acquired the GPA in different ranges showed that the students who passed O-level and A-level are distributed more in the GPA ranges of 2.0-2.5 and 3.51 – 4.0 as compared to the students who passed matric and intermediate examinations. 69% of the PSE students (matriculation and intermediate) gained the GPA between 2.51 and 3.5, while 51.6% of the GCE system (O- and A-level) students got the GPA between these limits. Chi-square test showed that the distribution of grades among these ranges was statistically different ($P = 0.02$). However, the mean GPA of the three groups: Group A, Group B, and Group C were 3.18 (± 0.43), 3.20 (± 0.49) and 3.21 (± 0.54), respectively. Analysis of Variance (ANOVA) could not detect any significant difference among these three mean values ($P = 0.82$).

Table 5 shows the opinion of the respondents regarding effectiveness and satisfaction of the system of the education they have obtained. Sixty percent of O-level and 62.7% of A-level students pointed out that those systems of education are highly effective, as compared to 21.8% of matriculation and 14.5% of intermediate students who indicated the same. About 19% of the intermediate graduates mentioned that this examination system is either ineffective or disadvantageous. However, it should be noted that about 50% of the students have shifted from GCE to PSE system after passing the O-level examination.

DISCUSSION

Comparison between GCE and PSE systems has always been an interesting discussion, not only in the academic arena, but also among the general public. Both systems differ fairly significantly in terms of standardization of curriculum, internationally established examination boards, global acceptability, fee

structures as well as duration (4 years in case of PSE system and 5 years in case of GCE system). Few studies have been conducted in Pakistan to compare these two systems, but the objectives of comparisons were mainly on the teaching methods and syllabus [2,4,6]. As far as the authors are aware, none of the study has compared the effect of these two systems to the performance of the students in their medical schools.

The ratio of students participated from the public to private institution in this study was 4:1. Because the number of approved admissions by Pakistan Medical and Dental Council, regularity body for medical and dental education in Pakistan, in the selected public institutions: Dow Medical College and Sindh Medical College, are 350 each and approved admission in selected private institutions: Liaquat National Medical College and Bahria Medical College, are only 100 each [7]. Therefore this ratio of 4:1 reflects reasonably accurate representation from these institutions. Furthermore, male to female ratio of 1:4 in the survey is also close to the number of male and female students admitted in the medical colleges of Pakistan [8].

This study showed that the average tuition fee of O-level students was more than three times of average tuition fee of matriculation students. Similarly, the average tuition fee paid by A-level students was about nine times more than average tuition fee paid by intermediate students. It should be noted that

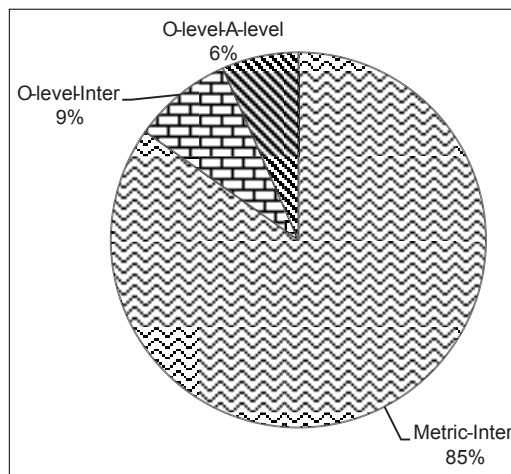


Figure 2: Academic background of the respondents

Table 4: Comparison of academic performance through GPA of medical students with three different academic tracks

GPA	2.0-2.5	2.51-3.0	3.01-3.5	3.51-4.0	P value	Total	Mean GPA (\pm SD)	P value
Matriculation + intermediate	56 (8.0)	183 (26.0)	302 (42.9)	163 (23.2)	0.02	704	3.18 (± 0.43)	0.820
O-level + intermediate	5 (7.0)	24 (33.8)	19 (26.8)	23 (32.4)		71	3.20 (± 0.49)	
O-level + A-level	8 (13.3)	11 (18.3)	20 (33.3)	21 (35.0)		60	3.21 (± 0.54)	

GPA: Grade point average

Table 5: Satisfaction of the respondents of their earlier education system

Examination system	Highly effective	Effective	Satisfactory	Ineffective	Disadvantageous	Total	P value
Matriculation	156 (21.8)	228 (31.8)	243 (33.9)	73 (10.2)	17 (2.4)	717	$P < 0.0001$
O-level	76 (59.8)	38 (29.9)	10 (7.9)	3 (2.4)	0 (0.0)	127	
Intermediate	112 (14.5)	239 (30.9)	278 (36.0)	118 (15.3)	26 (3.4)	773	$P < 0.0001$
A-level	42 (62.7)	17 (25.4)	8 (11.9)	0 (0.0)	0 (0.0)	67	

the average tuition fee at intermediate level is about one-third lower than the average tuition fee paid at matriculation level. It is due to the fact that the most of the intermediate students enrolled in government colleges and fee structure for this program is controlled by the Higher Secondary Board, a regularity government body which manages intermediate syllabus, time schedule and examination. Consequently, the tuition fee of this program is quite lower than matriculation program, which is mostly managed by private administration and most of the matriculation graduates attend these private schools. This study also showed that the extra-coaching of O-level was double than matriculation students, and extra-coaching fee of A-level was also double than intermediate students. Two important arguments can be deduced from these findings. First, O-level and A-level program can only be afforded by affluent people, and this finding is concluded by all other studies comparing GCE and PSE system. Second, the general opinion exists in the society that the students of GCE system do not need extra coaching got mixed findings. During the schooling years, the students who do not need any extra-coaching do not differ significantly for both matriculation and the O-level system. However, during the college years, every 6 out of 10 students of intermediate system always needed extra-coaching, while only 1 out of 10 students of A-level system needed the same and the difference was highly significant. It shows that the teaching method, discipline and interest of the teachers are quite comparable in GCE and PSE system schools at school level while teaching methods and qualities are not working properly at college level. Since same teachers are producing good results at professional colleges, therefore, the system in the intermediate colleges is not disciplined, and teachers do not teach seriously in the colleges during the college time. However, the same teachers deliver good lectures very enthusiastically in the evening at the coaching centers. Therefore, nothing is wrong in the education system in the colleges, but the problem lies in poor administration and discipline in teaching. Either the teachers do not show up or do not take interest in delivering the lectures.

Study showed that students from PSE system acquired grades mostly in between 2.51 and 3.5. However, in GCE system more students got either lower grades or higher grades than the PSE system's student. Consequently, on average the difference of GPA between PSE and GCE systems' students was left out only 0.03 in favor of later system, which is quite insignificant as shown by statistical test. In contrast, there is a significant association, as mentioned above, between the three groups of students and the GPA.

This survey also indicated that every nine out of ten students of GCE system had the opinion that this system is very effective, as compared to PSE system where only about 50% had the same opinion. Comparing with this high percentage of satisfaction of GCE students with only half of the percentage of satisfaction by the PSE system could be the illusion created by the society that PSE system is inferior and not producing appropriate results. However, this study does not agree with this opinion. It should be noted that A-level needs 13 years of schooling while intermediate takes only 12 years of schooling. Furthermore, students have to send registration and examination fee in

British pound; hence country has to spend foreign currency for GCE students. Considering all the factors mentioned above: (1) One extra year of education, (2) spending nine time more tuition and three times more extra-coaching fee, (3) sending foreign currency outside of the country for registration and tuition fee, and then gaining only 0.03 extra GPA by the GCE system students when compared to PSE system students does not look worthy and needs to be further discussed and evaluated. To make some concrete conclusion, larger studies along with studies in other disciplines should be conducted.

CONCLUSION

This study concludes that the students who qualify their secondary education through GCE system; spend one extra year of schooling, pay many times more tuition and extra-coaching fee and send some foreign exchange overseas for registration and examination, gain very insignificant amount of academic achievement when compared to the students who qualify through secondary education system of PSE.

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