Determining the Correlation Between Language Scores Obtained by Medical Students in their University Entrance and Comprehensive Medical Basic Sciences Exams

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Abstract

Background and Purpose: Some professors and educators in the field of English language believe that the high grades attained by medical students in their Comprehensive Medical Basic Sciences Exam (CMBSE) are mainly a result of the students prior fluency in the language before entering medical colleges; they are of the opinion that these grades are not necessarily a result of the combined effort of the English teachers and students in language courses at the university. This research aims at determining the correlation between the level of fluency in English of medical students prior to university entrance and the grades obtained by them in their CMBSE after 3 terms of language courses at the university.

Methods: Seven of the major and smaller universities of medical sciences were selected. The language scores of 2426 students admitted to these universities during the three academic years of 1999 to 2002 in both the National University Entrance Examination (NUEE) and the Comprehensive Medical Basic Sciences Exam (CMBSE) were obtained from their related universities and from the secretariat of the Council of Medical Basic Sciences Education respectively. The language scores of each student obtained in both NUEE and CMBSE were then matched. The related SPSS software was used to assess the level of correlation between these two groups of language scores for the students of each university, for each academic year and semester and also the overall score for the three years.

Results: Overall a positive and moderately significant correlation was found between the NUEE language scores and those of the CMBSE of the students of the universities studied (P<0/001; R=443%). The level of correlation for the various universities studied differed (Max. 69%, min.27%). A comparison of the means of these two groups of scores also confirmed this correlation.

Conclusion: students' grades The NUEE language score was not the only factor affecting the student's CMBSE score; other factors such as the university's English teachers, existence or lack of a good language department, the attitude of university officials towards language teaching also played an important role in the students' grades.

Key Words: COMPREHENSIVE MEDICAL BASIC SCIENCES EXAMINATION, ENGLISH LANGUAGE, UNIVERSITY RANKING, NATIONAL UNIVERSITY ENTRANCE EXAMINATION

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Introduction

According to the regulations of the Ministry of Health and Medical Education (1), medical students of all medical universities, after passing all the medical basic science courses (including English language), have to take the Comprehensive Medical Basic Sciences Exam (CMBSE) to ascertain whether or not they have achieved the required levels in all subjects of the basic sciences of their medical curriculum. This exam is conducted twice a year in Shahrivar (September) and Esfand (February). The secretariat of the Medical Basic Sciences Education Council (MBSEC), the authority responsible for conducting this exam, ranks each university according to both their average scores and their scores in each individual subject.

At the time of this research, for the past 30 terms that the exam had been held, more often than not, major universities like the Tehran, the Shiraz and the Shaheed Beheshti universities of medical sciences had usually been ranked first, second or third (2). Many authorities and professors of English of smaller universities believe that the higher rankings obtained are usually a result of the higher quality of the students who gained entrance to these higher ranked universities, and not a result of the language courses taught for the terms prior to the CMBSE. The main contributing factor to this belief is the higher language scores obtained by these students in their university entrance exam.

In some, though not many, of the CMBSEs, students of and smaller, lesser well known, universities have even managed to get better scores in English language than the larger universities; for examples the grades obtained in the 13th CMBSE (September 1995- Shahrivar 74), by the students of the Urumieh university and the Fatemieh university of Qom, or the grades obtained by the students of Zahedan university in the 16th CMBSE (March 1997- Esfand 75) and again those obtained by the students of Yazd University in the 24th CMBSE, topped the grades obtained by students of major medical universities such as the Iran and the Shaheed Beheshti universities in Iran.

However to what extent the higher grades obtained by medical students in the CMBSE are correlated to, or affected by, the students prior levels of English, before entering university is the question that motivated this research.

We found no literature or records relating to any previous study conducted in this field, either at the Ministry of Health and Medical Education, which is the authority responsible for conducting the CMBSE, or at any research centers or medical or non-medical universities in the country.

This research was conducted according to the contract no.83.8.4 / 3.4865, for the period from Oct 2004 (Aban 1383) to Jan 2005 (Day 1384), drawn up between the vice chancellor for research of the Shaheed Beheshti University of Medical Sciences (SBUMS) and the authors of this article.

Methods and Materials

Initially in our research the study of existing data method was used, following which, in the later stages, the analytic-descriptive method was employed. SPSS software was used to determine the level of correlation coefficient.

To begin with, the English language scores of both the NUEE and those of the CMBSE of all male and female students admitted to the seven medical universities, i.e. Shaheed Beheshti, Tehran, Iran, Shiraz, Kerman, Zahedan, and the Bandar Abbas universities, during the academic years 1999-2000, 2000-1, and 2001-2 (2426 students in all) were obtained from the Sanjesh organization, the secretariat of MBSCE, and the related universities and entered into the related data sheets for analysis; following this, the two scores of the NUEE and the CMBSE for each student were appropriately categorized besides each other; scores of 447 students were excluded for various reasons such as failing to participate in the related CMBSE, transfer to another university, or dropping out of college, etc. Eventually 1979 pairs of matched scores of both the NUEE and the CMBSE remained. Using these scores, the following statistical operations were performed:

- The means of NUEE language scores of the students of studied universities in each semester, each academic year and over the 3 years collectively were separately calculated.

- The above process was repeated for the students' language scores of corresponding CMBSEs, i.e. the 26th, 27th, 28th, 29th, 30th and 31st CMBSE.

- Using the Pearson correlation coefficient, the correlations between the students NUEE and CMBSE language scores of each of the universities studied, in each semester, each academic year and all scores for the 3 years collectively were separately calculated. This was done to determine the extent to which the NUEE language score of each student affected his/her score in the CMBSE.

- The differences between the means of both sets of the NUEE and the CMBSE language scores of the students of each university for each academic term and year were compared; by doing this and by comparing it to that of other universities, the degree of relation between the language scores of the students obtained in NUEE and CMBSE could be relatively clarified. It needs to be mentioned here that during the 3-year study period, of the seven universities studied, only three i.e. the Tehran, the Shaheed Beheshti, and the Iran medical universities enrolled the minimum number of students required to participate in CMBSE both for the months of September and March; Shiraz had also reported the required number of students for both months only in the 2001-2 academic year; in the other two years, only in March, did the minimum number of students(more than 20) take the exam, while in the September exam, the number of students who took the exam, was below 20. In September 2001, though the number of students reported, was over 20 (i.e. 21), the results were not included in this research, as of the 21 students, a few, for one reason or another, dropped out, lowering the number to below 20 (3-4); according to CMBSE regulations the minimum number of students of each university required to participate in CMBSE is 20. As a result, during the 3-year study period, the data obtained from the University of Shiraz was only for the month of Esfand. The other 3 universities of Kerman, Zanjan, and Bandar Abbas reported the required number of students only in the March exam

during the 3 years, while for the September exams of these 3 years, the students enrolled by these 3 universities were below 20; hence based on the regulations stipulated for students taking the CMBSE, (3 - 4) the results were neither categorized nor analyzed.

Results

Overall a total of 60 correlations were calculated between the CMBSEs, and the NUEEs, (Tables 1-4) of these, 51 were statistically significant, whereas 9 were not. Among the significant correlations calculated for one semester, the highest correlation was that for the students of Shiraz university in the 29th CMBSE (R=69%, P<0.004) (table 2), while the lowest one was for the students of Kerman in the 26th CBSE (R=26.9%, P<0.045) (table 1).

On the whole, a positive significant correlation was observed between the students' language scores in NUEE and CMBSE; however the level of correlation was not high (R=443%, P<0.001), and varied according to the semester and the academic year studied.

Comparing the means of students' language scores in NUEE and CMBSE, it was noticed that Tehran medical science university (TMSU), which had obtained the highest mean in the NUEE (91.91, in the 1st semester of the academic year 2000-1), showed the highest mean for language in CMBSE as well, and the Bandar Abbas medical sciences university, that had the lowest mean in NUEE (63.18, in the academic year 1999-2000) had the lowest mean in the corresponding CMBSE as well, (R= 46.64) (table 1).

The association between the means of the language scores in NUEE and CMBSE was almost the same in other universities. In most cases where the mean of the students language scores in NUEE was high, their mean in CMBSE was proportionately at a high level too and vice versa (tables 1-4).

On th whole, the means of the NUEE and the CMBSE language scores of all students of the seven universities students of the seven universities studied (1979 students in all) over a 3-year academic period were respectively 82.85 and 64.86, the correlation coefficient of the

Tables1-3: NUEE language scores mean of the students admitted to medical school of the universities 2) and 2001-2(table 3), together with their corresponding CMBSE language scores mean as well as

Table 1: 1999-2000

Universities	Tehran MSU		Shahid Beheshti MSU		Iran MSU	
Semesters / Score	1st semester (26th CMBSE)	2nd sem (27th CMBSE)	1st sem (26th CMBSE)	2nd sem (27th CMBSE)	1st sem (26th CMBSE)	2nd sem.. (27th CMBSE)
NUEE Language score mean	87.16	85.21	81.15	81.72	79.80	78.22
CMBSE Language score mean	77.92	63.85	69.64	60.07	59.92	47.5
Correlation between the two means	46%	36%	45%	37%	47%	29%
p.value	0.001	0.001	0.001	0.001	0.001	0.005

Table 2: 2000-2001

Universities	Tehran MSU		Shahid Beheshti MSU		Iran MSU	
Semesters / Score	1st semester (28th CMBSE)	2nd sem.. (29th CMBSE)	1st sem.. (28th CMBSE)	2nd sem.. (29th CMBSE)	1st sem.. (28th CMBSE)	2nd sem.. (29th CMBSE)
NUEE Language score mean	91.19	87.06	86.75	78.13	86.40	84.27
CMBSE Language score mean	78.21	70.71	71.42	60.35	67.71	61.92
Correlation between the two means	29%	41%	56%	47%	30%	48%
p.value	0.003	0.001	0.001	0.001	0.025	0.001

Table 3: 2001-2002

Universities	Tehran MSU		Shahid Beheshti MSU		Iran MSU	
Semesters / Score	1st semester (30th CMBSE)	2nd sem (31st CMBSE)	1st sem (30th CMBSE)	2nd sem (31st CMBSE)	1st sem (30th CMBSE)	2nd sem.. (31st CMBSE)
NUEE Language score mean	86.88	85.22	83.79	81.04	80.99	80.88
CMBSE Language score mean	77.71	73.64	60.58	66.64	57.14	58.85
Correlation between the two means	49%	38%	40%	19%*	35%	28%
p.value	0.001	0.001	0.004	0.20	0.006	0.019

not significant

studied during the 1st and 2nd semesters of the academic years 1999-2000, (table 1), 2000-2001(table
the correlation between the two scores.

Shiraz MSU		Kerman MSU		Zanjan MSU		Bandar Abbas MSU	
1st sem.. (26th CMBSE)	2nd sem.. (27th CMBSE)	1st sem.. (26th CMBSE)	2nd sem.. (27th CMBSE)	1st sem.. (26th CMBSE)	2nd sem.. (27th CMBSE)	1st sem.. (26th CMBSE)	2nd sem.. (27th CMBSE)
79.65	-	75.21	-	70.70	-	63.18	-
70.35	-	63.35	-	45.78	-	46.64	-
41%	-	269%	-	43%	-	52%	-
0.001	-	0.045	-	0.010	-	0.001	-

Shiraz MSU		Kerman MSU		Zanjan MSU		BandarAbbas MSU	
1st sem.. (28th CMBSE)	2nd sem.. (29th CMBSE)	1st sem.. (28th CMBSE)	2nd sem.. (29th CMBSE)	1st sem.. (28th CMBSE)	2nd sem.. (29th CMBSE)	1st sem.. (28th CMBSE)	2nd sem.. (29th CMBSE)
86.35	73.44	76.99	-	85.19	-	71.10	-
71.85	47.14	62.57	-	54	-	62.5	-
29%	69%	42%	-	14% *	-	40%	-
0.020	0.004	0.004	-	0.52	-	0.018	-

Shiraz MSU		Kerman MSU		Zanjan MSU		BandarAbbas MSU	
1st sem.. (30th CMBSE)	2nd sem.. (31st CMBSE)	1st sem.. (30th CMBSE)	2nd sem.. (31st CMBSE)	1st sem.. (30th CMBSE)	2nd sem.. (31st CMBSE)	1st sem.. (30th CMBSE)	2nd sem.. (31st CMBSE)
82.55	-	79.66	-	76.82	-	77.71	-
63.14	-	61.14	-	47.57	-	61.78	-
46%	-	32%*	-	33%*	-	33%*	-
0.001	-	0.11	-	0.087	-	0.096	-

Table 4: NUEE language scores mean of the students admitted to medical schools of the universities studied during each of the academic years 1378-79, 79-80, 80-81 and the 3 years collectively together with their corresponding CMBSE language scores mean, as well as the correlation between the two scores

Factor / Universities	Academic year	Number of students	NUEE language score mean (out of 100)	CMBSE language score mean (out of 100)	Correlation (R)	P.value
Tehran MUS	78-79	298	86.18	70.85	41%	0.001
	79-80	200	89.17	74.57	399%	0.001
	80-81	190	86.02	72.71	42%	0.001
	3years overall	688	87	72.42	41%	0.001
Sh.Beheshti MSU	78-79	155	81.46	64.35	39%	0.001
	79-80	103	86.96	65.28	48%	0.001
	80-81	94	82.47	63.5	25%	0.012
	3years overall	352	83.34	64.35	39%	0.001
Iran MSU	78-79	133	78.77	51.78	34%	0.001
	79-80	117	85.29	64.64	40%	0.001
	80-81	126	80.93	58	31%	0.001
	3years overall	376	81.52	57.85	37%	0.001
Shiraz MSU	78-79	88	79.67	69.35	39%	0.001
	79-80	78	83.77	67.07	49%	0.001
	80-81	71	81.59	63.21	40%	0.001
	3years overall	237	81.63	66.78	41%	0.001
Kerman MSU	78-79	61	75.34	61.92	21%	* 0.102
	79-80	46	76.69	61.43	448%	0.002
	80-81	30	79.19	59.5	38%	0.037
	3years overall	137	76.55	61.35	32%	0.001
Zanjan MSU	78-79	34	70.70	45.78	43%	0.010
	79-80	25	83.71	53.42	17%	*0.41
	80-81	27	76.82	47.57	33%	*0.087
	3years overall	86	76.40	48.57	35%	0.001
Banndar abbas MSU	78-79	41	63.18	46.64	52%	0.001
	79-80	36	70.98	60.28	37%	0.024
	80-81	26	77.71	60.78	33%	*0.096
	3years overall	103	69.58	55.21	48%	0.001

not significant

two means being R=443% , P<0.001.

Discussion

A.The results revealed a positive moderate correlation of 44% (P<0.001) between the NUEE and the CMBSE English language scores of all the students over a three academic year-period. This suggests that while the scores obtained by students in CMBSE is definitely influenced by their scores in NUEE, i.e. their prior knowledge in English before entering the university, the correlations found were high for some universities and low for some others; this difference in the level of correlation indicates that the association was not a constant or regular one.

B. Differences observed between the means of NUEE and CMBSE language scores of the students of each university with those of other universities confirms, to some extent, this positive and moderate, but varying correlation. Tehran MSU, for instance, which, among the seven universities studied, managed to obtain the highest mean (91.91) for the NUEE language scores of the academic year 79-80, could get the highest mean (78.21) in

the related CMBSE(28th) language scores as well table 1), and Bandar Abbas MSU which had obtained the lowest mean (63.18) in the NUEE (in the academic year 78-79-1st semester), also got the lowest average score (46.64) in thecorresponding CMBSE(26th). It is worth mentioning here that although we found that CMBSE language scores of students are highly influenced by their NUEE, this is not the only factor affecting those scores; there are some other factors that too play a part in this regard, including the role of the related university language teachers, whether or not that particular university actually had a well-managed language department, the views and attitude of the chancellors and deans or vice chancellors and vice deans of the universities and colleges with regard to the level of importance of English for students and other problems concerning language teaching, and, last but not least, the efforts of students themselves towards learning English.

C. Not in all cases have the higher NUEE language scores resulted in correspondingly higher CMBSE scores, to an equal degree. A comparison between the language scores of the two medical universities of Kerman and Zanjan over the three academic

Table 5: The means of the students' NUEE and CMBSE language scores of seven universities studied over three academic years, and the differences between these two means

Name of the University / Scores	Tehran msu	Shahid Beheshti msu	Shiraz msu	Iran msu	Kerman msu	Zanjan msu	Bandar Abbas msu
Language scores mean in NUEE	87.2	83.34	81.63	81.52	76.55	76.4	69.58
Language scores mean in the related CMBSE	72.42	64.35	66.78	57.85	61.35	48.57	55.21
The difference between the two means	14.58	18.99	14.85	23.67	15.20	27.83	14.37

years, showed that even though the means of the students NUEE language scores for both universities were almost the same (76.55 and 76.40 respectively), the mean of the language scores the students of Zanjan obtained in CMBSE was 12.78 marks lower than that of Kerman university. Table 5 shows means of the NUEE language scores of the seven universities studied during the three academic years collectively, the language scores means of the related CMBSEs and it also gives the differences between these two means, illustrating the above mentioned problem.

The table also shows that although the students of Bandar Abbas MSU obtained the lowest language scores mean in their NUEE, their English language scores mean in CMBSE, compared to the other six universities, *was the closest to that of their NUEE language scores*, indicating that: 1: The most progress in language learning , in spite of their prior, very weak knowledge in English at the beginning of their academic studies, 2: The unceasing and painstaking efforts of the related officials and the Bandar Abbas language department in English teaching during the two and a half year-period prior to the CMBSE.

We can conclude hence that of the seven universities studied, those whose mean CMBSE language score was closer to the mean of their NUEE, i.e., the distance between the two means is less, had been more successful in teaching English to their students.

Conclusion

a: A positive and moderately significant correlation of 44% (P<0.001) was found between the English language scores of all the students in NUEE and CMBSE.
b: The level of correlation differed for various universities (max. 69%, min 27%).
c: A comparison between the means of the students' NUEE and CMBSE language scores confirmed this correlation.
d: Not in all cases did the higher language scores result in higher CMBSE scores to an equal degree.
E: The NUEE language score was not the only factor affecting the student's CMBSE score; other factors such as the university's English teachers,

existence or lack of a good language department, the attitude of university officials towards language teaching also played an important role in the students' grades.

Abbreviations

1. CMBSE: Comprehensive Medical Basic Sciences Examination
2. MBSEC: Medical Basic Sciences Education Council
3. NUEE: National University Entrance Examination
4. MSU: Medical Sciences University

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