Predictive validity of the comprehensive basic science examination mean score for assessment of medical students' performance

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ABSTRACT

Background   Medical e ducation c urriculum i mprovements c an b e a chieved b y e valuating s tudents' p erformance. Medical students have to pass two undergraduate comprehensive examinations, basic science and preinternship, in Iran.

Purpose   To measure validity of the students' mean score in comprehensive basic science exam (CBSE) for predicting their performance in later curriculum phases.

Methods   This descriptive cross-sectional study was conducted on 95 (38 women and 55 men) Guilan medical university students. Their admission to the university was 81% by regional quota and 12% by shaheed a nd other organizations' share. They first enrolled in 1994 and were able to pass CBSE at first try. Data on gender, regional quota, and average grades of CBSE, PC, and CPIE were collected by a questionnaire. The calculations were done by SPSS package.

Results   The correlation coefficient between CBSE and CPIE mean scores (0.65) was higher than correlation coefficient between CBSE and PC mean scores (0.49). The predictive validity of CBSE average grade was significant for students' performance in CPIE; however, the predictive validity of CBSE mean scores for students' performance in PC was lower.

Conclusion   The students' mean score in CBSE can be a good denominator for their further admission. We recommend further research to assess the predictive validity for each one of the basic courses.

Keywords   *PREDICTIVE VALIDITY, COMPREHENSIVE BASIC EXAM*

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Introduction

Assessment of students' academic achievement aims for evaluating students' learning. Therefore, this approach firms bases for improving students' edu- cational program (1).

The current medical education curriculum, which was designed in1981 by Cultural Revolution council and was revised by Medical Curriculum Committee in high council (2), consists of four phases:

- basic science and general courses (first two years)
- semiology and pathophysiology,
- clerkship in clinical courses
- internship i n c linical c ourses p lus c ompleting a thesis project.

According to Iran's Ministry of Health, Treatment & Medical Education directives, medical students have to pass two under-graduate comprehensive examinations:

- comprehensive basic science examination (CBSE) at the end of first phase,
- comprehensive preinternship examination (CPIE) before starting the fourth phase.

These two written exams are used for assessing the competency of students in basic sciences and their ability for beginning the internship clinical courses, respectively.

There are different types of validity; which are content, face, construct, and criterion related validity (predictive, concurrent) (4). Predictive validity of an exam can show how much an exam is accurate for measuring students' performances (3).

This study was designed to determine the relationship between CBSE grade average and students' performance in later curriculum phases.

Materials and Methods

The study sample consisted of 93 medical students (38 female and 55 male) of Guilan University of Medical Sciences and Health Services (UMSHS), who were enrolled for the first year of curriculum in 1994. Their admission to the university was 81% by regional quota and 12% by shahed and other organizations' share. The students were assigned from those who had passed CBSE successfully at the first time. Data on gender, regional quota, comprehensive basic science examination (CBSE) score, mean pathophysiology courses grade average (PC), and comprehensive preinternship examination (CPIE) score were collected.

Data analysis was done by SPSS package. Pearson correlation coefficient and regression analysis was conducted to indicate the predictive validity of CBSE for assessment of medical students' performance in PC and CPIE.

Results

The results demonstrated that there was no statistically significant difference between the mean scores of CBSE, CPIE, and PC between the two genders. The standard deviation between CBSE and PC mean scores was not significantly different in both female and male students; however, CPIE mean score's standard deviation of male students was significantly greater than female students (Table 1).

As shown in Table 1, CBSE, PC, and CPIE mean scores of those students who were admitted by regional quotas 1 and 2 were higher than those of the students admitted by shahed and other quota.

The correlation coefficient between CBSE and PC mean scores was 0.49 (P=0.0001), which was lower than the correlation coefficient between CBSE and CPIE mean scores (r=0.65, P=0.0001).

Linear regression analysis between CBSE and PC mean score indicated that CBSE mean score had 0.24 (R^2) predictability for PC average grade. *F* test conducted on these two mean scores determined significant association (F = 29.45, P = 0.00001). Linear regression analysis between CBSE and CPIE mean scores indicated that CBSE mean scores had 0.42 (R^2) predictability for CPIE grade average. *F* test conducted on these two mean scores determined a significant association (F = 64.8, P = 0.0001).

Discussion

The results of this study demonstrated that the correlation coefficient between CBSE and CPIE mean scores (0.65) was higher than that between CBSE and PC mean scores (0.49). The predictive validity of CBSE mean score was significant for students' performance in CPIE; however, the predictive validity of CBSE mean score for students' performance in PC was lower.

From the correlation coefficient and linear regression analysis between CBSE mean score and mean scores of PC and CPIE, it can be concluded that the students' mean score in CBSE acted as a good denominator for their further admission. On the other hand, the students who successfully passed CBSE had also been successful in PC and CPIE.

CBSE is composed of questions on different basic science courses such as physiology, pathology, anatomy, and health. The science committee of Ministry of Health, Treatment & Medical Education reports annual ranking of universities based on CBSE mean scores of their students, and also reports the mean scores of universities in each basic science course. We suggest that future studies be designed for assessing the predictive validity for each one of the basic science courses.

References

1. Sorati M, Bazargan A, Hejazi Elaheh. Assessment of factors effective on Arak Medcial University medical students achievements in preinternship exam. Rahavard Danesh 1999;2(8):15-22.
2. Azizi F. Medical education improvements and impediments. J Shaheed Beheshti UMSHS;12(1):3-15.
3. Hajian Karimollah. Predictive validity of entrance exam special courses for medical students achievement in comprehensive basic science exam. Qazvin
4. Strieine DL, Norman GR. Health measurement scales: a practical guide to their development and use. Oxford: Oxford University Press; 1989. p. 106-10.J UMSHS 2000;13:3-7.