Correlation MCQ With Other Assesment Of First Year Medical Students

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Abstract. Background. Assesment is one of the most important issues that urge the medical students to learn. Nowadays the objective assesment gain its popularity. There are many assesments that composite the total assesment's scores of a medical student, which are oral tests (SOCA), short essay tests (OSPE) and clinical skills tests (OSCE). MCQ test is considered to be the best methode because of the reliability of the test. First year of medical learning is a critical phase because this is the transition phase of high school-based learning to university-based learning. Therefore, the evaluation of assesment of the first year examination's results might give better explanation about the transition of learning process that actually is the strong foundation of the long term medical learning process in the later years. The aim of this study was to find out the correlation of results of MCQ, SOCA and OSPE in first year medical students and to seek out whether gender correlates with the MCQ scores (as the best method of assesment). **Methods.** Population of sampel was 160 medical students. Data was collected from Computerized Educational System (SIAK-NG) that was numeric. All data was assessed by normality test and analyzed by Spearman Correlation test by SPSS 22 software**. Results**. In the first semester, mean scores of SOCA was the highest and MCQ and OSPE were the second and the third highest. There was a downward tren of MCQ mean scores between first and second semester. However, in the second semester MCQ was the lowest mean scores of the assesment. Regarding the corrrelation between MCQ and SOCA and OSPE was strong ($p < 0,01$) and correlation between MCQ and OSPE was stronger than MCQ and SOCA. Gender has no correlation with MCQ results**. Summary.** MCQ as a more objective assesment correlated more to OSPE (short essay tests) than to SOCA in first year medicine students. There was no gender difference between MCQ results of those students.

Keywords: First year, MCQ, Medical Students, OSPE, SOCA.

1. Introduction

Assessment and evaluation are important in the process of medical education. Undergraduate medical education program has extensively used MCQ as the summative assessment since many years ago. There are many plausible reasons for broad application of MCQ such as easy to perform in large classes, cover broad knowledge assessment and convenient standardization.[1] Moreover, until now MCQ are still considered as the most reliable assesment for medical students.[2]

To assess cognitive performance of undergraduate medical students, it requires not only MCQ but other test as well. There are SOCA examination (Student Objective Clinically Assessment),OSPE (Objective Structured Practical Examination) and OSCE (Objective Structured Clinically Examination). OSCE was not included in this study, because it mainly evaluates the skill performance to demonstrate some medical procedures and the scores of the examination are almost similar.

Since last decade, there has been a change in the method of medical education in Indonesia. Nowadays the method is called problem base learning, which medical students learn in small group to discuss the case comprehensively with guidance or supervision of a lecturer. First year medical students are facing the transition of learning method, from pedagogy approach to adult learning method.

this adult learning method is totally new thing to the first year medical students, because the learning process approach in the secondary schools is pedagogy. They should able to adjust and adapt fast to the changing method of learning.

In order to evaluate their success of learning is by scrutinizing the results of their tests. Because, MCQ are considered as the most reliable assesment. It is important to know whether the result of other tests are in line with MCQ results in first year medicine students. It is imperative also to know whether gender influence the MCQ results.

2. Methods

This descriptive retrospective study used sample population of 160 students of first year of school of medicine UPNVJ. Data was collected from UPN education internet system in October 2019. Data collected were MCQ, SOCA, OSPE scores from students in 1st semester and 2nd semester. Data was collected by non random sampling technique. STATA 16 statistical analysis software was used in this study. Data was numeric categorized and normality test done by Kolmgorov Smirnov. Data was presented in Graph Prism Software.

Because data was ditributed non-normal, non-parametric Spearman's Correlation analysis was used for data analysis to reveal the relationship between students' scores on MCQ, SOCA and OSPE.

The undergraduate curriculum in 1st year (consists of two semesters each), is included in the preclinical phase and consists of four sections for a limited number of weeks using problem-based learning (PBL) as a major instructional method.

The problem-based sections in 1st year are: Fundamental Basic System (FBS) 1 and 2 in the first semester and dermatomuscular system (DMS) and somatosensory system (SSS) in the second semester. Each chapter lasts for 7 weeks. The first semester is devoted primarily to learn the basic disciplines that include subjects of morphological and biochemical and physiological profile, such as histology and embryology, proper anatomy, biophysics and physiology. Later, they start to learn about the pathological related diseases in DMS and SSS sections.

3. Results

The number of student of first year of Medical Faculty of UPNVJ was 160 students. Table 1 shows that there is reduction of the number of student who completed the examinations (159 to 155; FBS 1 to SSS). This mean of MCQ was decreased as well from the first semester to second semester (75,5 to 66,4; FBS 1 to SSS).

Regarding the highest score among the examination, SOCA was always the highest scores in both semesters. However, there was a shift of the lowest scores of examination. In the first semester, OSPE scores in FBS 1 and FBS 2 are the lowest score. In the following semester, MCQ scores were the lowest in the SSS, OSPE was in the second rank.

Regarding the linier correlation between examination, the statistical analysis shows that MCQs correlated linierly to OSPE and SOCA (p 0,00) . However, cofficient correlation is higher in OSPE than SOCA (Table 2 and Figure 1). It means that MCQ correlated more to OSPE than SOCA.

Analysis test about correlation of sex and MCQs results shows that the correlation was negatif. It means gender did not influence the MCQs results (Table 3).

Tabel 1. Summary of Descriptive Analysis of Three Different Examinations of First Year Medical Students at UPNVJ.

	First semester						Second semester					
	FBS 1			FBS 2			DMS			SSS		
	MCQ	SOCA	OSPE	MCQ	SOCA	OSPE	MCQ	SOCA	OSPE	MCQ	SOCA	OSPE
Number students	160	160	160	160	160	160	160	160	160	160	160	160
Number of Complete test	159	159	159	158	158	158	157	157	157	155	155	155
Mean	75,56	75,41	65,67	72,24	75,38	69,04	69,38	74,83	65,76	66,42	73,00	70,16
Median	78,00	76,00	68,00	74,00	77,00	69,00	71,00	76,00	67,00	69,00	75,00	70,00
Minimum	44,00	56,00	41,00	35,00	21,00	50,00	10,00	20,00	10,00	37,00	22,00	41,00
Maximum	95,00	87,00	85,00	93,00	91,00	82,00	94,00	87,00	81,00	90,00	84,00	85,00
SD	12,18759	5,93399	7,60336	11,37421	10,25893	6,21055	12,52280	10,07196	9,41658	11,90695	9,22991	6,73602

Tabel 2. The Analysis Correlation of Examination Results of Medical Students from First Year at UPNVJ.

	First semester				Second semester			
	FBS 1		FBS 2		DMS		SSS	
	SOCA	OSPE	SOCA	OSPE	SOCA	OSPE	SOCA	OSPE
MCQ	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Coefficient correlation	0,576**	0,729**	0,641**	0,691**	0,528**	0,722**	0,614**	0,627**

** Correlation is significant at the level 0,01

Tabel 3. The Analysis of Correlation of Sex and Multiple Choice Question Exam Results of First Year Medical Students at UPNVJ.

	MCQ FBS1	MCQ FBS2	MCQ DMS	MCQ SSS
Sex	,969	,111	,460	,155
corelation coefficient	-,003	-,130	-,060	-,116

Spearman correlation coefficient r =0,576 (95 % CI = 0,4228 to 0,6537)

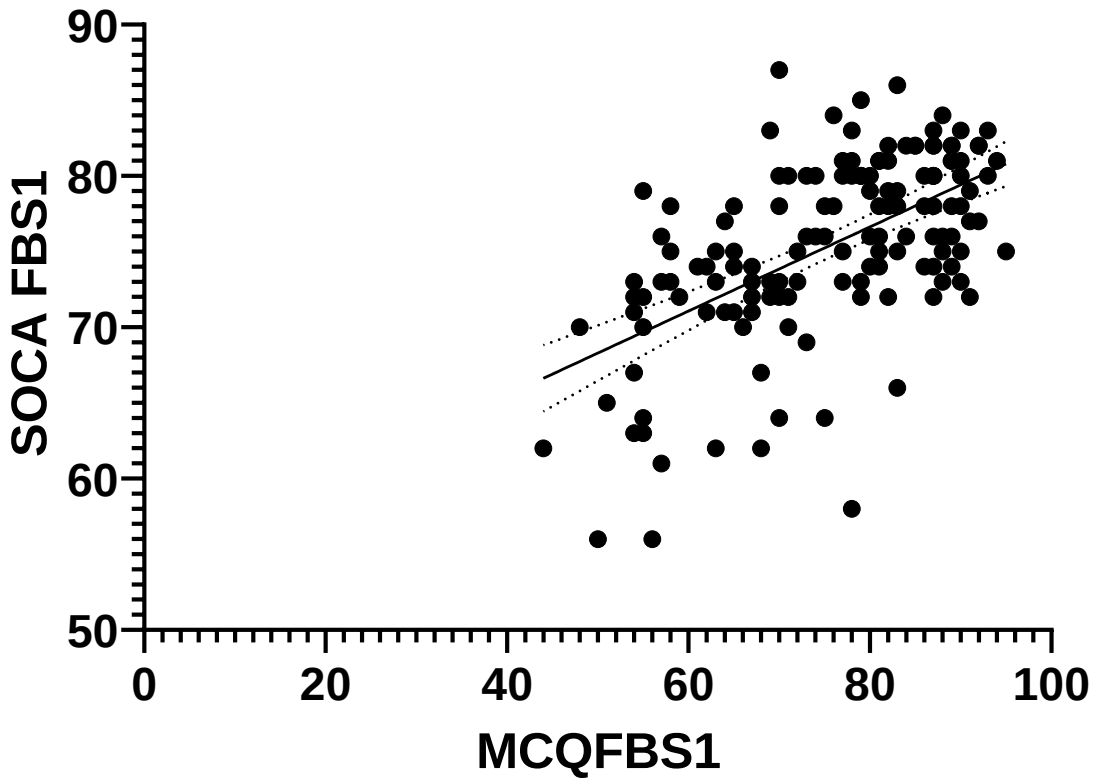

Figure 1. Example of A Graph with Correlation Between Scores in the Examination of MCQ and SOCA of FBS Section Of First Year Medical Students at UPNVJ.

4. Discussion

To portray the learning capabilities of students, It needs assessments and examinations. During six years medical school, assessments are required to notify the outcome of education process. It is not just important for the students, but also the tutor and faculty staff. This is especially true for first year medical student whom they still make adaption towards new system of adult learning.

The best assessment method should be reliable, cost effective and acceptable to students and fasilitator. Every method of assessment has some strengths and weaknessess. Assessment is a mean to give feedback to the students and fasilitators about the outcome of educational process. First year medical students are students who are still making adoptation about the process of education. It might be difficult for the students due to dramatic increase of the volume of content.[3] The students need to master the fundamental of medical learning. After spending years in formal school, many students enter medical school without having master this skills and resulting in poor academic performance.[4, 5]

MCQ is considered to be the best method because its reliability. However, there are some disadvantages such as they are poorly written in way that only to recall of independent facts or to know application of knnowledge.[6-8] A well structured MCQ can acknowledge higher order diagnostic logical thinking and knowledge, evaluating the examinee's ability to apprehend, judge, and act based on medical information. However, writing questions for MCQ writing MCQs that evaluate application of knowledge can be challenging, and most faculties are not formally trained.[9,10]

Mean MCQ tests results were the second lowest in the first semester of medical students and even the lowest in the second semester in Universitas Pembangunan Nasional Veteran Jakarta Indonesia. It can be assumed that the students there had difficulties in mastering all the medical information. Even though, in this transition period, the students are still learning the basic process of systems in human bodies, still some students had problems in learning in the first year. This assumption came also from the reduction of number of students who finished the examinations in the second semester from 159 to 155 students.

The weakness of this study was also there was no validity tests of our MCQ questions. In that case it was hard to tell the quality of the MCQ tests. However, it could be concluded that our first year medical student still had problems to apprehend and adopt the new learning process. In this part the fasilitators and other stakeholders should discuss and acknowledge the issues in order to help the students building the foundation of long term medical learning process.

As in the United States, the assessment of medical students is majority based on a model that was expanded by the Accreditation Council for Graduate Medical Education (ACGME). This model applies six close-related domains of competence; one of them is medical knowledge. Competence can be said as a habit of lifelong learning than an achievement.[11,12] Habit of life long learning should be build up from the first semester.[13] This is why evaluation of education process and outcome important in the first year of medical students.

There is also one important point to keep in mind that assessment need to be continous and frequent.[14] Carraccio[15] highlightes that during a competency-based education program formative assesment is more important than summative assessment.The consideration behind the formative assesment is because the personal feedback from the tutors or fasilitatators to the students as good as assessment and effective feedback can be a tremendous help in building life long learning.[16,17]

Regarding whether sex influenced the success of a first year medical student in MCQ test, this study result was in line with the study that seek for the influence of gender in GPA of medical students.[8,18-21] A female and male student had the same success in MCQ tests. This pointed out that a female or male first year medical student still have to struggle in learning the basic medical information and adopt the adult learning process.

5. Summary

MCQ as a more objective assesment correlated more to OSPE (short essay tests) than to SOCA in first year medicine students. There was no gender difference between MCQ results of those students.

Acknowledgement

Special appreciation to Mr. Suwarno that enabled the data collection. Dr. Mutia, Ms. Bunga for helping to collect the students scores.

Disclosure

The authors declare no potential conflict of interests in this study.

Abbreviation

UPNVJ Universitas Pembangunan Nasional Veteran Jakarta

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