Febriza A & Fitria A, JPKI, 2022;11(4):444-450
doi: 10.22146/jpki.43063

CASE STUDY

ANALYZING THE ASSOCIATION OF ORAL EXAM WITH SOCA AND WRITTEN TEST USING MCQ ON MEDICAL STUDENTS

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Submitted: 27 Jan 2019, Final Revision from Authors: 29 Sep 2022, Accepted: 24 Oct 202

ABSTRACT

Background: An oral examination is a method to assess which student responds to one or more examiners' questions. This method has been used in clinical examination for a long time. Students' Oral Case Analysis (SOCA) is one of the oral examinations usually used in academic assessments for medical students. It has proven its ability to improve students' critical thinking, motivation, and capability in analyzing a clinical case. On the other hand, written examination using Multiple-Choice Questions (MCQ) has proven to be able to give a brief description of cognitive abilities. Our study aims to analyze the correlation between the results from oral examination using SOCA and MCQ test results of undergraduate medical students.

Case discussion: It was a cross-sectional study with 143 students as respondents. SOCA assessment scores were collected to evaluate students' analytical skills after the tutorial. MCQ exam scores were calculated from the final test, consisting of 100 questions related to the Cardiovascular course. Our results reported that the average score from SOCA score was higher than the MCQ test. A significant linear association was found between SOCA and MCQ test with $p < 0.005$.

Conclusion: The significant association between the findings of the SOCA and MCQ indicates that SOCA could predict the MCQ test results.

Keywords: SOCA, MCQ test, assessment, undergraduate students

PRACTICE POINTS

- This article examined the relationship between SOCA and the cognitive abilities of medical education students.
- This article provides recommendations that can be applied to the implementation of SOCA for medical students.

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INTRODUCTION

An oral examination is a method to assess which student responds to one or more examiners' questions. This method has been used in clinical examination for a long time. Students' Oral Case Analysis (SOCA) is one of the oral examinations usually used in academic assessments for medical students[1]. For some medical faculties, SOCA has become one of the instruments to assess student performance in clinical partnerships. Oral case presentation is indeed considered important in the medical education process, especially in presenting a case and even in explaining the condition of the disease to the patient or the patient's family.[2] The oral or verbal examination is commonly used to assess clinical knowledge and skills in both undergraduate and postgraduate medical education. Given their obvious face validity, oral examinations are thought to evaluate effectively clinical competencies, including knowledge, communication skills, and critical thinking.[3] On the other hand, the written or MCQ test has several advantages: short implementation time, broad range of themes of knowledge covered, high objectivity, straightforward analysis, computer-friendliness, being analyzable for effectiveness, transparency, and being capable of explaining to students about what is right or wrong. However, the weakness of the MCQ test is that it cannot be used to assess attitudes and skills.[4]

SOCA administration to undergraduate students provides them with an opportunity to demonstrate their knowledge, communication skills, and scientific interaction professionally. Students may harness this opportunity to improve their scientific presentation abilities. SOCA has proven its ability to improve students' critical thinking, motivation, and capability in analyzing a clinical case. On the other hand, written examination using Multiple-Choice Questions (MCQ) has proven to be able to give a brief description of cognitive abilities.

This study aims to analyze the correlation between the results from oral examination using SOCA and MCQ test results of undergraduate medical students.

CASE DESCRIPTION

Study Design and Data Analysis

This study used a cross-sectional design. SOCA scores were collected to evaluate students' analytical skills after the tutorial. MCQ test scores were calculated from the final test, consisting of 100 questions related to the Cardiovascular course. Our results reported that the average score from SOCA score was higher than the MCQ test. The MCQ test was harder and more time-consuming than the oral examination because the former did not allow the students to ask the assessor for clarification, which otherwise was possible in the latter. A linear association was calculated between SOCA and MCQ test with Pearson correlation test.

Characteristics of Respondents

The respondents consisted of 143 students of the Cardiovascular block in Faculty of Medicine and Health Sciences in University of Muhammadiyah Makassar. The inclusion criterion was students with a minimum attendance of 80%, and the exclusion criterion was students not fully present in the tutorial process and during SOCA assessment.

Procedure

Modules

A total of 4 modules were used in the Cardiovascular course, namely modules on chest pain, dyspnea, palpitation, and pain in lower extremities. The topics covered by the modules are based on general practitioners' competencies listed under the Indonesian Doctor's Competency Standards (SKDI) of 2012.[5] These modules are equipped with scenarios, learning strategies, student assignments, guidance for tutors, several alternative questions and answers, and several main references. Each module consists of twelve different scenarios.

The implementation of tutorial group discussion

The Cardiovascular course was run for 6 weeks. The implementation of tutorial group discussion started in the second week, preceded by an expert

lecture. Students were divided into several small groups to discuss with some tutors. The tutorial group discussion consisted of four meetings. In the first meeting, the students discussed scenario to determine various possible diagnoses, sorted by level of possibility. In the second meeting, they carried out independent learning to look for additional information to establish a temporary diagnosis. In the third meeting, they returned to the discussion, presenting their findings and establishing a temporary diagnosis. Each group was to have different diagnostic conclusions. The fourth meeting was a meeting to evaluate students' analytical skills using the Student's Oral Case Analysis (SOCA) method.

SOCA

SOCA is one measure of summative evaluation (of learning outcomes) that is done orally. It involves exposure of students to the assessor and other students in a group. It aims to:

a. assess students' ability to present problems from data in scenarios,
b. assess students' ability to analyze problems and provide direct answers to the problems analyzed,
c. assess students' level of understanding of the materials underlying the problems,
d. assess students' ability to draw conclusions,
e. assess students' ability to compile case conceptual frameworks systematically,
f. assess students' attitudes during the presentation process,
g. assess students' active communication skills during the presentation process, and
h. assess students' systematic thinking skills in expressing ideas.

In the SOCA assessment, the assessor administer an assessment based on a checklist provided by the Faculty of Medicine and Health Sciences of the University of Muhammadiyah Makassar (Figure 1).

CHECK LIST OF SOCA IN CARDIOVASCULAR BLOCK
3rd SEMESTER ACADEMIC YEAR 2018/2019
MODULE _____/DATE _____

GROUP 1

No.	Student Name	Central aspect	Causal relationship	Pathomechanism of the disease	Steps in diagnosing	Therapy	Education	Performance*	Score	Information
1	Asrah Srimurti									
2	Hafidah Aulia									
3	Samsul Rahmat									
4	Nuranisa									
5	Sekar Putri Sakinah									
6	Siti Hardianti Sugeha									
7	Yulianti									
8	Syadad Hadi									
9	Dhia Falih Annisa									
10	Anisa Aditya									
11	Andi Muscalifah									
12	Jihan Ramadhani Putri									
13	Tezya Devanagari Firalli W									

*Point for performance :
1. Attitude
2. Communiation skills
3. Presentation sytematics

Performance :	
3	If all three points are good
2	If only 2 from 3 points are good
1	If only 1 point is good

Grade in problem answering :	
3	If the answer is correct
2	If the answer is wrong
1	If there is no answer

Tutor,

( )

Figure 1. Checklist of the SOCA Assessment

At the time of SOCA implementation, each student was asked to present the results of discussion before the assessor. Each student was allowed a period of about 10 minutes. The students were asked to explain the central aspects of the scenario, the causal relationship, the pathomechanism of the disease, the steps of establishing a diagnosis, the management and education plan, and the referral system. In addition to the abovementioned points, the assessor also assessed students' performance in terms of attitudes, communication skills, and systematic presentation (Figures 2 and 3).

Figure 2. Students Presenting the Results of Discussion and Being Subject to Assessment by the Assessor

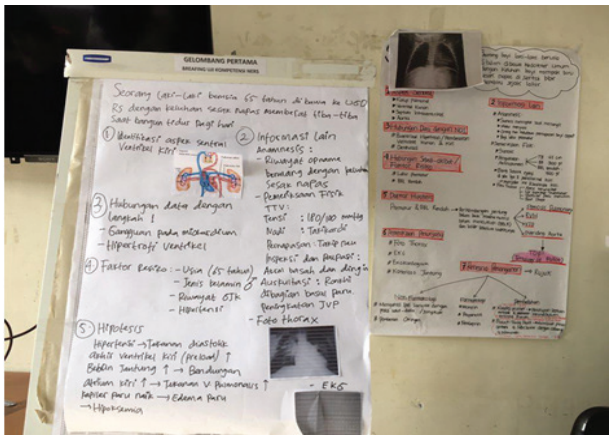

Figure 3. Students' Presentations during the SOCA Assessment

Multiple-Choice Question (MCQ) test

In the last week of the course, an evaluation in the form of a computer-based Multiple-Choice Questions (MCQ) test was conducted to assess students' cognitive abilities. This exam consisted of 100 questions, covering all the materials taught throughout the course.

Statistical Analysis

Given that this research used numerical data, the Kolmogorov-Smirnov normality test was carried out. If the data were not normally distributed, the hypotheses testing which required that the data be normally distributed could be conducted after data transformation by logistic transformation. If data were normally distributed, Pearson analysis was carried out to assess the association between SOCA scores with MCQ test scores. But, if data were abnormally distributed, the Spearman analysis was used instead. The significance level was determined at $p < 0.05$, and the confidence interval was determined at 95%. Data analysis was performed using the computerized statistical software SPSS 21.

Ethical Approval

This study was approved by the Medical and Health Research Ethics Committee of the Faculty of Medicine and Health Sciences, University of Muhammadiyah Makassar (Makassar, Indonesia), with registration number 058/UM.PKE/IX/43/2019 on November 3, 2019.

Evaluation Results

Table 1 shows that the average SOCA score was 92.83 (SD = 4.40) and the average MCQ test score was 56.55 (SD = 13.38).

Table 1. Distribution of Variable Characteristics

Variable	N	Average	SD	Min	Max	Median
SOCA score	143	92.83	4.40	64.30	100.00	92.90
MCQ test score	143	56.55	13.38	27.00	83.00	57, 00

Table 1 shows that the average SOCA score was higher than the average MCQ test score. The written test was harder and more time-consuming than the oral examination because the former did not allow the students to ask the assessor for clarification, which otherwise was possible in the latter.

Table 2 shows the results of the Kolmogorov-Smirnov normality test. Because $p < 0.005$, it can be concluded that the distribution of SOCA and MCQ test scores was not normal.

Table 2. Data Normality Test

Variable	Value p	
SOCA score	0.000	$p < 0.05$
MCQ test score	0.002	$p < 0.05$

Pearson correlation test was conducted to determine the relationship between SOCA scores and MCQ test scores, from which, as shown by Table 3, a significance value of 0.000 was obtained, which means that there was a linear relationship between SOCA scores and MCQ test scores. The existence of a significant relationship between the results of the two assessment methods shows that SOCA assessment scores could predict the ability of students in the written (MCQ) test.

Table 3. Results of Correlation Test between SOCA Scores and MCQ Test Scores

Variable	Statistics	SOCA Score	MCQ Test Score
SOCA score	Correlation coefficient Sig. (2-tailed)	1.000	0.407 ** 0.000
MCQ test score	Correlation coefficient Sig. (2-tailed)	0.407 ** 0.000	1.000

**. Correlation was significant at the 0:01 level (2-tailed) with the Pearson correlation test

DISCUSSION

Previous studies reported that, even though they tended to make students feel nervous, students still thought that oral assessments were more useful than written assessments.[6] There was evidence showing that anxiety about an oral examination was stronger than anxiety about a written test.[7–9] These results suggested that oral assessment may be better than written exams. The oral assessment method can be helpful for students to build their professional identities as doctors later.[10] Other studies of nursing students showed that oral examinations could effectively evaluate students' understanding and clinical applications in practice. Verbal assessments are equally effective or even more effective at evaluating students' understanding of medical topics and their applications in practice. This was indicated by higher scores of the oral examination compared to scores of the written exam and by students' positive commentaries.[11] Evidence from other studies suggested that students categorized the structured oral case simulation as the most highly rated testing method and perceived that oral examinations were better at evaluating their clinical abilities when compared to written tests.[12]

Our study reports that SOCA scores were higher than MCQ test scores (Table 1) as a result of the difference in the difficulty levels of the questions given in the two exams.[13] The oral exam is different from the MCQ test, in which case the answers to the latter are absolute and uncontestable. The answers given by students to an MCQ test must be correct for the students to achieve a perfect score. Lower MCQ test scores can be caused by lower quality of the questions formulated in terms of grammar and sentence structure, thereby increasing students' confusion, and by questions that are too broad, leading to students' uncertainty as to which materials to be studied.[14]

Verbal communication is an important element of clinical practice and an integral part of medical education. Oral case presentations are often used in professional doctor practices. A study showed that a curriculum designed with the involvement of communication skills resulted in an increase in student confidence. This finding underpinned the need to include verbal ability assessment through SOCA assessment in the undergraduate medical education process.[15] It should be noted that previous studies have indicated that standardized oral examinations were better at evaluating medical students' clinical competency when compared with non-standardized approaches.[16] Oral case presentations help lecturers deal with challenges. As noted by previous studies, structured oral examinations were effective at assessing students' competency.[16–18]

The SOCA assessment can improve students' learning process in various ways, such as the following: (1) students will try to anticipate questions that they cannot predict by trying to fully understand the topics they are studying; (2) students will prepare themselves to avoid 'looking stupid' in front of

the assessor or their peers; and (3) some students who are reluctant to voice their opinions out will be encouraged to present themselves and convince the assessor that they have an understanding of the topics they will present.[19] There is some evidence suggesting that structured oral examinations would improve students' communication skills in medical language.[17]

Ramsden noted that the relationship between assessment methods and the quality of learning has been recognized since at least the middle of the nineteenth century.[20] The use of assessment will directly stimulate students to learn more actively to get organized information and try to find correlations and implications of the topics studied.[21] The oral examination tends to evaluate students on thought process metrics, such as their focus, organization, thoroughness, pacing, decisiveness, and need for prompting.[22] Based on the results of this study, the oral assessment method would indirectly increase students' motivation and enthusiasm in active learning, which then would affect the results of the MCQ test positively.

The fact that this study involved students in only one course limited this study. Involving more students from several classes is recommended. The strength of this study, however, lies in its ability to prove that the SOCA assessment method, which is an oral assessment, has a relationship with cognitive abilities testing. Therefore, we consider this exploratory study as the beginning of an ongoing learning process.

CONCLUSIONS

The SOCA assessment method can be considered valid and reliable in testing the cognitive aspects of students. However, more in-depth inquiries into factors that can affect validity and reliability are needed through other psychometric studies.

RECOMMENDATIONS

The medical education unit or study program should provide a blueprint for SOCA that represent the learning outcome of the course. A combination of SOCA and MCQ tests will provide a more comprehensive assessment for the course.

COMPETING INTEREST

The authors declare that there is no competing interest in relation to this study and publication.

AUTHORS' CONTRIBUTION

Ami Febriza – Developing research designs, analyzing data, and writing manuscripts.

Anni Fitria – Collecting data, analyzing data, and writing manuscripts.

ACKNOWLEDGEMENTS

We would like to thank the students of the Faculty of Medicine and Health Sciences, University of Muhammadiyah Makassar, for actively participating in this study.

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