



A Comparison of the Effect of Using Log Books and OSATS on the Progress of Medical Students in Anatomy Course

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Authors' contributions

This work was carried out in collaboration between all authors. Authors SM and MRM designed the study, wrote the protocol and wrote the first draft of the manuscript. Author AA managed the analyses of the study. Author GAAF revised the draft and authors MGM and MM managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Background: Student evaluation is one of the most important aspects of educational activities. There are various assessment tools such as log books, OSATS (Objective Structured Assessment of Technical Skills) and portfolios.

Aim: This study aimed to compare two methods of assessment: using a log book and OSATS, on the progress of medical students offering anatomy course.

Methods: This interventional study was carried out with medical students. In the first half of the semester, the students filled out their log book of limb anatomy. The log books were reviewed during a meeting by a teacher and feedback was given to them. Lower limb anatomy was taught in the second semester and after that, evaluation was done using an OSATS test, and feedback was given to the students. Finally, the traditional evaluation method, log-books and OSATS were compared using SPSS software.

Results: Average mark for the practical part of the anatomy of the upper extremity with log book was 17 while the mean mark for the practical part of the lower limb anatomy, using the OSATS method was 15.26. A total of 23 students (82.14%) were satisfied with the logbooks and it was found useful for anatomy practice. A total of 71.42% of medical students reported OSATS method to be a fair test and 35.72% of them reported that OSATS method is full of stress.

Conclusions: Students as well as the teacher were more satisfied with evaluation by log book. In contrast, OSATS method was not satisfactory.

Keywords: Log books; Objective Structured Assessment of Technical Skills (OSATS); medical students; anatomy course; limb anatomy; satisfactory.

1. INTRODUCTION

Assessment is a system that collects, analyzes and interprets data and makes them clear to the extent that learning objectives are achieved [1]. The most efficient way of improving the quality of education is by assessment and evaluation.

Assessment is the systematic collection of data to monitor the success of a program or course in achieving the intended learning outcomes for students. Evaluation is a judgment by the instructor or educational researcher on whether the program or instruction has met its Intended Learning Outcomes.

In addition, it is a way of identifying the strengths and weaknesses of the training, help to evaluate the performance of teachers and motivate the students [2]. Worten and Saunders [3] divided evaluation into six groups as follows: A- goal-oriented model: In this evaluation, approach determines to what extent, the objectives have been achieved. B- Management-oriented patterns: This approach aims to achieve the needs of administrators. C- Consumption patterns: Based on this approach, information is obtained from customers. D- Expert –oriented models: In this approach, there is emphasis on the opinions of experts and specialists in the subject of evaluation. E- Experts disagree-patterns: In this model, there is comparison of

the disagreement of the evaluator. F- Naturalistic patterns or partnership: This is the antithesis of goal-oriented approach. House [4] offered other subdivisions of objective and subjective approaches. This evaluation places emphasis on the overall achievement. In contrast, another approach is the subjective approach, and in this, the value of the program is dependent on the individual members and not the majority of them.

At present, with reform of education, there are efforts to engage students in educational activities. In order to achieve this, a continuous evaluation of students is required during the semester to provide training and feedback to students, for their defects to be corrected. Evaluation of student is essential in education since it does not only aid in understanding the strengths and weaknesses of the educational process, but also help teachers in the assessment of their activities. Anatomy is often difficult for Persian speakers for two reasons: First, first semester students do not have an individual management. These students are fresh from high schools. It is necessary that there should be self-management in the university, since students have not yet reached this degree of empowerment. Second, anatomy is a difficult course and it contains a large number of English and Arabic words instead of Persian terms. Hence, the effectiveness of various assessment tools for training is important. Examples of

evaluation tools are written tests, practical test, clinical course, OSATS (Objective Structured Assessment of Technical Skills), OSCE (Objective Structured Clinical Examination), log book and port folio. OSATS and log book are clinical performance tests [5]. A log book is a note book for expressing the objectives of the course and recording the student's performance. Nowadays, an anatomical log book is used for training in the universities of medical sciences namely Mansoura University, Maharashtra University, Peradenia University and Semnan University.

OSATS is a standard method for evaluating skills used by the University of Toronto since 1990. This method is similar to OSCE method except that it does not occur in the real environment, but the individual claims mastery in real environments. This method is organized in the various stations and participants are requested to show at each station, their learning skills in the field of theoretical and practical training content. The OSATS method usually evaluates the clinical skills, attitudes and cognitive aspects of the students and practical skills are performed on models [5,6].

Log book and OSATS method are a formative evaluation that is a monitoring. On the other hand, due to the variation in the OSATS stations, its properties are fair. If a student is weak in one part, he could obtain a compensatory score in other items. Evaluation tools that make students more involved during the semester are recommended, because they are more effective in the training. To the authors' best knowledge, there is no research on comparison between log book and OSATS method in the anatomy course. Therefore, the aim of the present study was to compare between satisfaction using log book and OSATS method, on the level of academic achievement of medical students taking anatomy course.

2. METHODS

After obtaining approval from the Ethical Committee of Gonabad University of Medical Sciences, this interventional study was performed with second semester medical students in 2013. After recording demographic characteristics, the traditional method was used in the first semester.

In the traditional method, log books, OSATS or other evaluation methods were not used and only

the final examination was held. The second semester was divided into two parts. Levels of courses in terms of difficulty were matched in each semester. Due to availability, the students were sampled during the first and second semesters. The inclusion criterion was medical students who passed limb anatomy course. Exclusion criterion was transfer or visiting medical student. The sample size was based on census method. This study was conducted in two semesters in an identical student group. In other words, students in the second semester were freshmen who were taught with traditional methods in the first semester.

The medical students received logbooks in the first half of the second semester. They filled out log books after each anatomy class. The log-books were collected in a folder that is called portfolio and were reviewed during a meeting by the teacher and feedback was given to them.

The Log book consisted of two parts: one part which was filled out by the students and the other one filled out by the teacher who considered the score. For example, in anatomy of the scapula bone, various parts of the bone like coracoid process, acromion process and glenoid fossa were in the log book. After the questions, the students were graded on these parts. The mean score of the students was 17. In the OSATS method, for example, questions were asked on a part of the tibia bone and a score was assigned to this section. The Likert scale was used to assess the degree of satisfaction, that is, very poor, poor, average, good and excellent, were considered as 1 to 5 score, respectively. The mean score of student satisfaction was 3.8 in the log book and 3.38 in OSATS. Scores 3 or more than 3 were considered to be satisfactory and below 3 were unsatisfactory.

Lower limb anatomy was taught in the second semester. After explaining the OSATS method, evaluation of students was done using the OSATS method. The stations were prepared in the dissection room. At each station, parts of bone, models and cadaver were marked. For example, in the cadaver station, students were asked to find the brachial artery or median nerve. Students had to perform a rotation between stations after the time elapsed for answer to the questions. No student was permitted to meet students who were waiting for the OSATS examination in an isolated room. Finally, the results of evaluation with the log book and OSATS were compared.

The questionnaire included demographic characteristics, dimensions of satisfaction on assessment test, the fairness of the test and the time of test. Questions were based on a five-point Likert scale as follows: Very poor, poor, average, good and excellent. The reliability and validity of the questionnaire were confirmed by test-retest method and expert teachers.

Questionnaires were given to 20 students in order to identify ambiguous questions. The ambiguous questions were reedited and again the questionnaires were distributed among the students.

Cronbach's alpha was calculated as 0.82. To describe the data, descriptive statistics (mean and percent) and SPSS version 20 was used. For comparison between evaluation and satisfaction of the log books and OSATS methods, T-test was used and there was significance at $P < 0.05$.

2.1 Scapula Bone in Log Book

You can see details of self-evaluation by both student and teacher about scapula bone in Table 1.

3. RESULTS

Twenty eight medical students who were in their second semester were enrolled in this study. The students were 19 females (67.85%) and 9 males (32.14%). The mean age of students was 19.96 years; the highest age was 22 while the minimum age was 19 years (Table 2). The highest average grade was 19.90 and the lowest was 16.75. Average mark for the practical part of the anatomy of the upper extremity with log book was 17 while the mean mark for the practical part

of the lower limb anatomy, using the OSATS method was 15.26. A total of 23 students (82.14%) were satisfied with the logbooks and it was found useful for anatomy practice (Table 3).

The results showed that the students were more satisfied. A total of 89.28% (25 students) agreed on evaluation with log book and suggested the use of logbooks for other courses such as histology. In terms of satisfaction, this amount which was obtained by evaluation with the OSATS method, 64.28% ($n = 18$), had a statistically significant difference between the two groups ($P < 0.05$). However, 71.42% of medical students reported this method to be a fair test and 35.72% of them reported that OSATS method is full of stress. Also with regards to time suitable for this method, the level of satisfaction for the OSATS group was lower than that of the log-book group ($P < 0.05$).

4. DISCUSSION

Overall, Students' satisfaction for log books was more than the OSATS method. Some students found OSATS to be a stressful method. In a study, self-evaluation of 47 students of midwifery on the skills of obstetrics and gynecology was conducted in Shahrekord University. The results showed that self-assessment scores of students were similar to that of the teacher in the obstetrics and gynecology section. Thus, it seems that the criteria in the evaluation form are acceptable for evaluating students [7]. Similarly, in the present study, the results of student's evaluation using a log book were similar to that of the teachers. In another study, the effectiveness of medical students in the course of training was investigated using log books in view of teachers and students in Mashhad University.

Table 1. Self-evaluation by student and teacher about scapula bone

Self evaluation of student	Evaluation by teacher (Mark)			Scapula bone	
	Good	Moderate	Weak		
	2	1	0	Subscapular fossa	1
				Acromion process	2
				Coracoid process	3
				Spine of scapula	4
				Glenoid fossa	5
				Supraspinatus fossa	6
				Infraspinatus fossa	7
				Scapular notch	8
				Neck of scapula	9
				Scapular crest	10
				Final mark	

Table 2. Demographic data of students (N=28) in Gonabad University of Medical Sciences, Iran

Gender	Marital status	Living in dormitory	Age (mean ± SD)
19female /9 male	27 single/1 married	27 Yes /1 No	19.96 ± 2.6

Table 3. Comparison between satisfaction with OSCE method and log book

Satisfaction	OSCE method	Log book
Agree with this method is fair	71.42%	68.40%
Agree with this method is stressful	64.28%*	28.32%
Recommending this method to others	89.28%*	64.28%
Time suitable of the method	62.1%*	80.5%
Overall satisfaction	82.14%*	64.28%

Values are presented as percent. Independent samples T-Test was used to compare values

* P<0.05

The results showed that most of the students regarded this approach as a method recording false information. Although teachers knew log book as a document for recording the activity of students in the hospital, they also knew the success rate of log book in achieving educational goals was at a low level [8]. Inconsistent with this study, in the present study, the instructors of the log book gained the satisfaction of both students and teachers. This could be because the log book helps student on details of educational goals. In addition, the use of log book makes continuous evaluation of academic progress easy and it connects the teacher and students for direct feedback. This self-evaluation was mentioned by students as a useful method. Teachers introduced this method as a way for students to focus on learning goals and expectations clearly. The Log book familiarized teachers with the strengths and weaknesses of the students. On the other hand, it should be noted that the log book is time consuming and may be filled by students in a symbolic form. In another research at the University of Minnesota in America, OSATS method was used for evaluating the simulated basic skills of first-year surgical assistants. Twenty five first-year residents were trained in 5 sessions (10 weeks) on disinfection, skin preparation, wearing of gloves and gun, tying and suture. Thereafter, a patient with a fresh skin injury was put on station and the assistants started skin wound cleaning and stitching for 20 min.

At the end, the assistants were evaluated using a check list. Evaluation was done before and after training of the assistants. At the beginning of the year, the average scores of residents was 49% and their performance was considerably lower than that of the second-year (68%) and third-year residents (74%). The mean scores of first-year residents increased significantly after 10 weeks using the OSATS method. The results showed that the training program for the first-year resident helped in the achievement of surgical skills.

They concluded that educational programs require methods of evaluation that provide better evidence of effective training [9]. In the present study, satisfaction from the OSATS method was at a low level. Students stated reasons which include limited time and stressful nature of this method. In a study by Faryabi and colleagues [10], 78.6% of students in Kerman University believed that the OSATS method increases stress of students. In another study, theory training in comparison with practical training in the management of delivery was evaluated using the OSATS method in the department of obstetrics and midwifery.

Two hundred and three medical students were randomly divided into two groups. In the first group (n = 103), the students were trained on creation management with educational model by the evaluator for 30 min and subsequently, the participants were trained on practical exercises which were performed on the plastic model. In the second group (n = 100), training was done by an evaluator in a display form for 30-min. Afterwards, the participants were evaluated immediately and at 72 h after training, using the OSATS method. The results of the assessment showed that the scores were significantly increased in the first group when compared with the second group [11]. There is a large body of evidence that suggests that students are not good at self-assessment [12].

In the present study, the skill levels of medical students in different years of education were not compared using the OSATS method and it can be evaluated in future research. Evaluation using OSATS method is useful because of diversity of stations and fairness. However, by increasing the

time, the test can be held better in standard examinations. The limitation of this study is that a logbook was used as the assessment tool at the beginning while the OSAT method was used at the end.

5. CONCLUSIONS

Students as well as the teacher were more satisfied with evaluation by log book. In contrast, OSATS method was not satisfactory.

CONSENT

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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