PROSECTED PLASTINATED CADAVERS IN ANATOMY PRACTICAL TEACHING: COMPARATIVE ASSESSMENT STUDY IN RELATION TO OTHER METHODS

BY

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ABSTRACT

Considerable attention must be paid to the anatomy course as an important fundamental base for medical undergraduate students. Continuous evaluation of the teaching outcomes can positively affect the education process. Comparative study has been proposed to achieve the continues assessment for recognizing the superior method in anatomy information retention and recall during the anatomy practical classes. Prosected plastinated method was used in relation to other modern and classical anatomy teaching methods, in the same time recording the level of satisfaction and efficiency of the superior method by the student's opinions. 240 students were distributed as two equal groups according to the topic to be taught (A & B): (muscles of the upper limb for group A, posterior abdominal wall for group B), Each topic was explained by the same teacher for both groups. Further, both groups were sub divided into six subgroups (A1, A2, A3) & (B1, B2, B3), 40 students for each, according to the method using plastinated cadavers, plastic models, atlas images, respectively. This was followed by ten minutes arrowed unlabelled diagram quiz, and questionnaire covering the satisfaction and efficiency for the superior method according to the scores. Quantitative data from the questionnaires and the quizzes scores were analyzed using descriptive statistics for comparisons of answers and results between groups and One Way ANOVA test to evaluate the difference and variability of the methods used. In a good rate of satisfaction response, the higher scores for the subgroups (A1 & B1) who were subjected to plastinated cadavers. The students gained the excellent marks, were 42.5% for group A1, 27.5% A2, 15% A3. while B1, B2 and B3 were 62.5%, 32.5% and 27% respectively. The present study considers the prosected plastinated cadavers to be a superior teaching method. While cadaveric as a classical method, achieves a considerable amount of satisfaction and efficiency, other tools such as plastic models and images on data show, can be considered as a supportive rather than a replacement teaching method.

KEYWORDS: Anatomy, Practical Class, Plasinated Cadavers, Medical Students, Questionnaire.

INTRODUCTION

Studying the validity and effectiveness of the methods used in undergraduate anatomy teaching will be very helpful to improve the anatomy curriculums. Comparative evaluation can overcome the limitations and gives a clear idea to the educator and coordinators about the designing of anatomy programs in future (1-5). Although different methods are used to evaluate the teaching levels and student's outcome still the valid standardized questionnaire assessment has the superiority. Since it reflects the evaluation according to the opinions of students themselves, who are the core-subject of the information receiving methods. An interesting experience in Aga khan university in Pakistan, since more than thirty three years, they have regular annual and semi-annual evaluation for the medical education level (6). The

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assessment of the anatomy teaching tools was recognized through the descriptive type. Research projects using comparative studies have been limited. Thus, few studies are available to compare and contrast different approaches for teaching and learning anatomy (7) as reported by Prince and others (2003), the medical imaging approach may not be equally conventional for preclinical students (8), since it was shown to be more effective among students exposed to regional anatomy sessions for diagnostic knowledge (9). While strong relationship was found between the human body basic and clinical knowledge and the cadavers use in anatomy learning (10), questionnaire filling, focuses on collecting information about the student's interest in anatomy. Continuous assessment is essential for improving student's performance and development. It also enables educators to explore more closely students' abilities to benefit from academic lesson. (11). In order to assess student' attitudes towards learning, a set of questions are created for the purpose of gathering information about the adequacy of anatomy mastering when applying a new learning process (8). Various scientific approaches have been developed to reliably evaluate student' performance and motivation, including the use of standardized questionnaires such as Likert test analysis. The higher scores, will reflect the superior preparation level, while the total student's GPA can assist in the judgment, which is considered a valid assessment tool (12,13).

MATERIALS AND METHODS

A total of 240 undergraduate students, at the faculty of medicine, Tripoli University were included in this study. 106 (44%) of the targeted population were males and 134 (55,8%) were females. The students were subjected for the first

time to an anatomy topic as a practical class, followed by ten minutes arrowed unlabelled diagram quiz aimed to assess student' ability to identify structures mentioned during the class. Some questionnaires were used to monitor the effectiveness of some factors in anatomical teaching tools (14).

During the second part of the study, the students were asked to fill in a questionnaire regarding satisfaction and efficiency.

Questionnaire form:

The assessment questions included the following questions:

1- Is this class decrease my self-study hours in this topic

2- By this I have adequate rate of information retention after this class

   3- I fully understanding of the basic outlines

4- Now I can confidently discuss the topic.

5- This method made me more interactive during the class.

6- I think my information recall have been improved.

7- I kept attention during the class without my written notes.

8- This method increases my orientation and interest.

The expected answers were: Strongly disagree, Disagree, Neutral, Agree, Strongly agree.

The questionnaire was specified to the subgroups learned with prosected plastinated cadavers, for the purpose of evaluation and assessment of the relatively more appropriate method used in teaching anatomy practical sessions. As the participant students are distributed into two equal groups according to the topic to be learned (A & B) (muscles of the upper limb for group A, posterior abdominal wall for group B). Each topic was explained by the same teacher for

each group. The methods to be comparatively assessed were plastinated cadavers, plastic models, and atlas slides. Each group was subdivided into 3 subgroups (A1, A2, A3) & (B1, B2, B3) forty students in each, followed by ten minutes arrowed unlabelled diagram quiz. No pre-exposure test was obtained because the students were selected to be first exposed to the explained topic. The post exposure test was homogenous (exposed for the same time with the same teacher), for both groups of students. The students subjected to plastinated bodies were asked to participate in satisfaction and efficiency evaluation of this method. The efficiency reflected in form of information retention and recall. all students responded to the questionnaire, so, a 100% response rate were achieved.

Statistical analysis: Statistical analysis was carried out using SPSS 19.0 software (SPPS Inc). Quantitative data from the questionnaires and the quizzes scores were analyzed using descriptive statistics for comparisons of answers and results between groups. Describe the study tool as constant, and with great validity according to Cronbach's Alpha analysis, while the simple Regression test recognizing the statistical relation of the satisfaction and efficiency for the students learned with cadavers. The variability and correlation of the different groups together were evaluated using (One Way ANOVA test) according to the methods to be used (plastinated, plastic, atlas).

RESULTS

The quiz results, (table 1), recorded a higher score for the subgroups (A1 & B1), were subjected to plastinated cadavers, with excellent marks as following 42.5% of group A1, 27.5% A2, 15% A3 while B1, B2, B3 were 62.5%, 32.5%, and 27% respectively.

Table 1: Variability in Quiz Scores according to teaching method.

Teaching Methods	Group A Quiz Results			Group B Quiz Results		
Degree	E (n) %	V. G (n) %	G & B (n) %	E (n) %	V. G (n) %	G & B (n) %
Prosected Plastnate	(17) 42,5%	(11) 27.5%	(12) 30%	(25) 62.5%	(5) 12.5%	(10) 25%
Plastic Models	(11) 27,5%	(8) 20%	(21) 52.5%	(13) 32.5%	(9) 22.5%	(18) 45%
Atlas (Slides Show)	(6) 15%	(9) 22.5%	(25) 62.5%	(11) 27%	(7) 17%	(22) 55%

E: Excellent, V.G: Very Good, G & B: Good & Below.

The very good degrees in Group A were 27.5%, 20%,22.5%. While group B are 12.5%,22.5%,17%, respectively. Lower marks were related to atlas slides method in both groups 62,5% for A3 and 55% B3. Which documents the plastinated cadaver as great. The results obtained from the survey explained into two blocks of questions in (table 2), those related to the satisfaction during practical class (questions from 1 to 4) and those related to the Efficiency of the method (questions from 5 to 8). resulted in high satisfaction and efficiency rate. Details of assessment of internal evaluation system by students are shown in (table 2). Which described by each question as the following: Eighty eight percent of the students, agreed and strongly agreed that the class decrease their self-study hours in this topic. Valid method in anatomy practical class teaching. While 83.02% of students, were satisfied with adequate rate of information retention after this class. And 92.2% of

the respondent's thinks, they strongly agreed and agreed that Full understanding of the basic outlines. Now the respondents can confidently discuss the topic reaches in 73.3%. On the other hand, the efficiency part of questions,

was of high level in the same manner as the following; Students said the evaluated method made them more interactive

during the class were (93%), While whom their information recall has been improved (100%).

They kept attention during the class without using written notes approximate (93%). The method increases the orientation and interest is about (91%) of the examined sample, Cronbach's Alpha analysis was (0.853) for the study tool validity.

Table 2: Survey results of the Subgroups Subjected to prosected cadavers method (A1 & B1).

Answers	Satisfaction n(%)				Efficiency n(%)			
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Strongly disagree	1(1,2%)	3(3.7%)	0	1(1,2%)	0	0	1(1,2%)	1(1,2%)
Disagree	1(1,2%)	3(3.7%)	1(1,2%)	6 (7,5%)	2(2.5%)	0	1(1,2%)	1(1,2%)
Neutral	7(8,7%)	8(10%)	5(6,2%)	13 (16.2%)	3(3.7%)	0	3(3.7%)	4(5%)
Agree	43(53,7%)	41(51,2%)	45(56,2%)	49(61.2%)	51(63.7%)	58(73%)	51(63,7%)	51(63,7%)
Strongly agree	28(35%)	25(31,2%)	29(36,2%)	11(13,7%)	24(30%)	22(27%)	24(30%)	23(28.7%)

The simple Regression test recognizing the statistical relation of the satisfaction and efficiency, which appeared as strength as (R=0.815). While the determination factor was (R square=0.86) that explain the efficiency, according to the student's satisfaction with (F=154,411) at value of significances (sig=0.000).

The variability and correlation of the two groups together, that learned with

plastinated cadavers, were evaluated using (One Way ANOVA test) according to the methods to be used, which summarized as (table 3). That (F) value is (3.965) at (sig=0,054) For the first group. While (F) value is (4.701) at (sig=0.036) for the second group. From here we can say the statistical differences are at value of (P≤0,05).

Table 3: One Way ANOVA test to evaluate the difference and variability of the methods to be used.

		Sum of Squares	df	Mean Square	F	Sig.
Group1	Between Groups	1.736	1	1.736	3.965	.054
	Within Groups	16.639	38	.438		
	Total	18.375	39			
Group2	Between Groups	1.344	1	1.344	4.701	.036
	Within Groups	10.867	38	.286		
	Total	12.211	39			

DISCUSSION

Several studies have appeared in recent years reporting the prosected cadaver, as a basic influential method for anatomy learning, in medical schools. Seeking expert advice and consultation, though old,

is still a successful and effective approach despite incessant incorporation of new teaching methods and technologies, (9,15,16). Cadaveric dissection has long been used as an effective teaching method of anatomy in medical schools.

Students exposed to this traditional teaching approach have been shown to achieve significantly higher scores compared to their counterparts in
other groups. (10,11). The cadaveric teaching based on small groups of students, under the supervision of a qualified anatomist, remains the gold standard teaching process for anatomy teaching, with a strong suggestion about the newly incorporated tools, to be used as supporting materials rather than being a total replacement for the cadaveric teaching (16-19). However, most of the mentioned studies do not take into account some disadvantages which can limit the effectiveness of this method.

Exposure to cadaveric dissection has been linked to some undesirable impacts in various academic, social, or behavioural aspects. Indeed, cadaveric dissection has been appraised to be a source of anxiety for anatomy students. Therefore, a remarkable proportion of students exhibited a propensity to avoid practical anatomy classes (6). These findings were attributed to a number of potential factors including, low encouragement (75%), sluggishness and low activity (27%), in addition to other contributors such as poisoning, sensitivity and nightmares (7). In our faculty during undergraduate anatomy course designing, some anatomy courses are devoid from cadavers use, because of very large number of students, opposing to less anatomy teaching stuff. In similar research targeted a new medical college in the United Kingdom, cadaveric tools were the also excluded owing to high costs and students' safety requirements. This, of course, does not include the surgical anatomy and pathological autopsy classes (6,7,8). Another important limitation of the cadaveric dissection the curriculum designer could encounter is the

cultural and religious acceptance of the concept of body donation and dissection. (12,20). Evaluation based on survey and only post exposure test scores were considered for our study and the variability was relying on the method, but not the topic. unlike the study which based on pre and post class exam scores. Academic performance among students may vary significantly across different anatomical topics. In this regard, the abdomen as well as head and neck were associated with higher student scores as compared to neuroanatomy section (21).

CONCLUSION

the aim of this study was to evaluate the effectiveness of various anatomy teaching tools among undergraduate medical students using post exposure tests combined with simple standard questionnaire. It can be concluded that the use of prosected plastinated cadaver is remarkably helpful approach for teaching of anatomy practical classes, as indicated by the students post exposure test score analysis, and the survey according to statistical Likert test, which reflect the same basic lines and interests for most of the samples. These findings highlight the necessity of periodic evaluation of the anatomy program curriculum and tools of teaching in order to ensure better learning outcomes among undergraduate medical students. Incorporation of other supporting methods and teaching tools, such as plastic models as well as atlas slide show can undoubtedly improve the efficiency of teaching and the quality of learning.

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