

The rate of knowledge retention in basic sciences courses among dentistry students

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Abstract

Background. Acquiring and recalling knowledge can be considered as the starting point of learning; so increasing the acquisition of knowledge and information recall is one the most important goals of education.

Objective. To determine the students' information recall in the basic courses of histology, immunology, physiology, biochemistry, head and neck anatomy, and microbiology in dentistry school.

Method. In this descriptive survey, 60 students who had passed their basis courses were studied. The tests were held five semesters following the basic courses, and were like those they had passed previously.

Results. The results revealed that information recall was the highest for the physiology course ($z=0.72$), while it was the lowest for anatomy ($z=0.07$). For the histology course, the lowest mean score was achieved by the students entered in the year 1997, and the highest by those entered in 1999. The relationship between the entry year of the students and their information recall is statistically significant ($p<0.05$).

Discussion. The results showed that the teaching basic science courses such as physiology, anatomy, immunology, microbiology, and biochemistry should accompany new strategies in teaching and learning. One of these is the inclusion by the teachers of retrieval cues in any course so as to facilitate learning.

Keywords. KNOWLEDGE RETENTION, BASIC SCIENCES

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Introduction

Training is considered as any preplanned activity or policy designed to bring about learning in the learners. This could be beneficial if the learner was able to retain the acquired knowledge in his /her memory and recall and use it for application

as soon as possible. Research findings reveal that 80% of the data presented in the form of lectures will soon be forgotten (1). Sperze also states that memorization of the text books information is the correct appropriate way of learning used by the students throughout the United States colleges (2, 3). Cohen and Stahope reported that when students were actively involved in learning and completing practical experiments, they tended to have more stable long- term memory structures and a higher level of memory performance (4). Chance stipulates that certain types of training should be substituted

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for the current procedures and learners have to be taught how to analyze the facts and how to generate and organize information. They have to learn how to defend their viewpoints, evaluate evidences and solve the problems as well.

Regarding the foregoing discussion and also regarding that one of the effective ways to study training and learning would be assessing the students' knowledge retention, it was decided to evaluate the students' rate of knowledge retention in the School of Dentistry. Evidently, the course contents which are recalled longer are associated with some grounding factors; this will also be discussed later.

Material and Method

In this cross-sectional study, 60 dentistry students, all of whom had previously passed the Basic Sciences Courses, were studied through census. In order to determine the students' information recall in the basic courses of histology, immunology, physiology, biochemistry, head and neck anatomy, and microbiology, a set of tests were designed that were similar in their content to the exams that the students had passed in these course before.

The tests were given about 2.5 years after the Basic Sciences Course. The students participated in a meeting moderated by the teachers and education experts to get familiar with the research goals. Through access to the question bank, 10 multiple choice questions from each of the above-mentioned courses were selected and extracted. In another meeting the students, uninformed previously but motivated adequately, were tested with the selected questions.

Results

As the Table reveals, information recall was the highest for the physiology course ($z=0.72$), whereas it was the least for anatomy ($z=0.072$). The mean score for histology was 8.35 for the students entered in the academic year of 1995-96; 7.39 for those entered in 1997-1998; and 10.76 for the students entering in 1999-2000.

Thus, ANOVA test results indicate that there is a statistically significant relation between the entrance year of the students and their information recall ($p<0.05$). For the physiology course, this relationship is also statistically significant ($p<0.05$). As the results of the related ANOVA indicate, the students' mean score was 9.06 for those entered in 1995-1996 and 6.69 for the entrance of 1997-1998; whereas for the students entered in 1999-2000, it was 8.30.

Discussion

Findings of this research indicate that the students' knowledge retention has been the highest in physiology and histology courses. In these two courses, the teachers use audio-visual facilities as well as quizzes throughout the whole semester. Quiz, as Eery states, can be considered as one of the creative testing mechanisms that brings about retention thus resulting in the students' more academic progress (6). In order to reinforce retention in such courses, not only the number of quizzes has to be increased, but it is also necessary to reinforce learning skills in the students (5).

Confirming this idea, the previous researches reveal that virtually 32% of students suffer from extremely poor study skills; so there is an urgency to teach them the skills required for designing a study strategy, internalizing effective study habits, and concentration, as well as acquiring the skills for memorization and reinforcing memory.

In addition to poor study skills, other factors can also affect learning including the significance or insignificance of the course and the subject to be learned in the students' viewpoint.

Generally speaking, a common weakness for information recall seems to be related to things such as having problem with retrieval ability, which can be due to lack of retrieval cues. It follows that it could be most appropriate if the teachers would include teaching retrieval cues in their various study courses. The inclusion in the curriculum of a course termed "study and learn" could be beneficial as well.

Table 1. The Mean Scores of the Dentistry Students Basic courses
According to their Entrance year

Course	Entrance Year	No	Mean	Standard Deviation	Statistic test		Z score
					P- value	Analysis Of Variance	
Histology	1995- 1996	15	8.53	4.43	3.32	0.044	0.34
	1997- 1998	23	7.39	3.64			
	1999-2000	13	10.76	3.11			
Immunology	1995- 1996	15	8	2.26	0.022	0.979	0.14
	1997- 1998	23	7.91	3.27			
	1999-2000	13	8.15	4.35			
Physiology	1995- 1996	15	6.13	3.41	0.917	0.407	0.72
	1997- 1998	23	5.65	3.44			
	1999-2000	13	4.46	3.06			
Biochemistry	1995- 1996	15	8.53	3.24	0.193	0.825	0.22
	1997- 1998	23	8.34	4.20			
	1999-2000	13	7.69	3.44			
Head and Neck Anatomy	1995- 1996	15	8.53	4.03	1.341	0.271	0.07
	1997- 1998	23	6.60	3.27			
	1999-2000	13	7.38	3.40			
Microbiology	1995- 1996	15	9.06	3.01	3.064	0.056	0.07
	1997- 1998	23	6.69	3.16			
	1999-2000	13	8.30	2.68			

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