

Recall Knowledge of Biochemistry for Interns after Graduation from Medical Schools

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Abstract—New medical graduates were recruited during their internship programme from 10 teaching hospitals for a cross-sectional study, carried out in Riyadh area, Kingdom of Saudi Arabia. A total of 200 participants were included in the study. All the participants filled out the study questionnaire. The questionnaire contained 10 basic Biochemistry questions that the graduates were supposed to recall answers for those questions from their prior knowledge. Results revealed that out of the 200 participants recruited for this study, 124 were males and 76 were females. 26% of the participants graduated from medical schools adopting PBL curriculum whereas 74% were from traditional medical schools. Less than 10% of the participants correctly answered score ≥ 7 whereas 64% scored ≥ 4 to 6 and only 26% scored less than 4 of the basic biochemistry questions. Correlation of scores attained by the participants with other variables in the questionnaire revealed interesting findings. However, of the teaching approach adopted by their schools of graduation showed significant correlation with score with P-value of 0.006. The findings suggest that basic biochemistry is perceived as a tough and irrelevant subject and expedite the need for reforms in the way the subject presented to the medical students.

Keywords: Biochemistry, PBL, MCQs, Medical Schools

Introduction:

Biochemists consider that Biochemistry is very important for medical education. On the other hand, many medical students see that biochemistry teaching lacks clinical relevance. Traditionally, Biochemistry was taught as a separate subject in the preclinical basic course. Nowadays with PBL teaching system being adopted by many medical schools worldwide, biochemical knowledge is included in real-life clinical scenarios at PBL sessions. The question of which of the two approaches is more appropriate for grabbing biochemical knowledge is remained unanswered? A study was done by Clack (1994) on five cohorts of King's College medical graduates in the UK that commented about their perception of biochemistry in their 'traditional' basic science course. It seems that not only were they taught a 'vast quantity' of detailed biochemistry with lack of clinical relevance but it also led to excessive learning for examinations [1]. Many authors are convinced that students learn more effectively if the knowledge and skills they acquire are inserted and contextualized in relevant real-life, problem based situations or when adopting outcome-focused curriculum [2]-[3]. The judge of the recall knowledge of biochemistry or other courses in basic medical sciences does not mean judge on the quality of graduates of any of the systems adopted in teaching Medicine to medical student. However, it will help in reforming and improving the way of introducing the subject. Testing the recall knowledge is not the only way to assess someone's knowledge using MCQs. Nevertheless, it remains the best the simplest and takes less time in reaching the best answer in comparison to MCQs designed to test the analysis or reasoning abilities of medical students. The main focus of the present study was to compare the recall of knowledge of biochemistry between graduates of medical school adopting conventional and integrated approaches.

Material and Methods

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200 interns were recruited from 10 teaching hospitals in Riyadh area, Kingdom of Saudi Arabia for this is cross sectional study. The study was based on structured questionnaire containing 10 validated basic biochemistry MCQs (Fig 1) that the graduates were supposed to recall from their prior knowledge. Other information included were; gender, year of graduation, medical school, training hospitals and whether preparing for board exams such as USMLE and PLAB. The results were entered into excel software and SPSS software was used for the data analysis. Descriptive statistics was applied in numeric form (mean and standard deviation) to describe quantitative variables. Frequency distribution was done to describe the qualitative and quantitative variables. Analytic statistics to find the association between different variables was done using chisquare test for qualitative data. A level of $p \leq 0.05$ was taken as the cut-off value for statistical significance.

Results

Table I: Descriptive Statistical Analysis of the Participants' Data

Total no of participants	Gender		Type of med school curriculum		Time since graduation/Years			Prep for Exams		Rotation when Participated in the study				
	Male	Female	Integ	Conv	1	2	3	Yes	No	Med	Paedia	O/G	Sur	Other
200	124	76	50	141	111	79	3	86	112	49	65	20	42	44
100%	62%	38%	25%	70.5%	55.5%	39.5%	1.5%	43%	57%	24.5%	32.5%	10	21	22

Table 2: percentage of participants attained different marks.

Score	Number of students	%
≥ 7	18	9%
Score ≥ 4 to 6	123	61.5 %
Score ≤ 4	51	25.5%
Not answered	8	4%
Total	200	100%

Table3: Mean for students score

type of school	Mean	N	Std. Deviation	P-value
traditional	4.71	142	1.560	0.006
integrated	4.00	50	1.512	
Total	4.53	192	1.575	

Table 4: Score according to background variable
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Variable		Mean score	S.D	P-value
Sex	Male	4.44	1.63	0.429
	Female	4.62	1.51	
Time since graduation per year	3	4.33	2.08	0.745
	2	4.43	1.70	
	1	4.61	1.50	
Type of Medical School	Conventional	4.71	1.56	0.006
	Integrated	4.00	1.47	
Preparation for exams	Yes	4.60	1.50	0.372
	No	4.40	1.64	
Rotation when participated in the study	Medicine	4.80	1.77	0.723
	Surgery	4.36	1.58	
	Paediatrics	4.38	1.54	
	O/G	4.65	1.50	
	E/R	4.29	1.26	
	Others	4.57	1.81	

Table 5: Correlation between participants' scores and other parameters.

Parameter	Gender*System adopted	Time since graduation/Years*System adopted	Rotation when Participated in the study*System adopted	Prep Exams*System adopted for
P-value	<0.001	<0.001	0.368	0.936

Discussion

Biochemistry is a key subject in understanding structure and function of different biomolecules human body in health and disease. This study used MCQs to assess the recall of biochemistry knowledge abilities of junior doctors during their internship. Study findings revealed that the low marks (4.53 \square 1.575) scored by medical graduates from both the conventional and integrated medical schools might suggest that Biochemistry is perceived by them as a tough subject or irrelevant to medical education rather than a key in medical education biochemists see it. Study by Clack [3] on five cohorts of King's College medical graduates evaluated how well they perceived the various components of their undergraduate course had equipped them for medical practice. The most striking feature of this study is the large (79.5%) number of doctors who perceived that there was 'too much' biochemistry in their 'traditional' basic science course. Such studies clearly uncover genuine problems but raise many more questions than they answer. Would doctors taught in an 'integrated' course or via 'Problem-based Learning' or hyperid instructional system have the same perception of biochemistry? Unfortunately, no studies have been carried out on doctors trained in the integrated system. However, line evidence suggest that the amount of biochemistry that students need to learn during Problem based Learning courses is significantly less than that found in conventional course. Clearly, there is a perception that there is simply too much biochemistry taught in conventional medical courses. Furthermore, doctors in the King's study commented that not only were they taught a 'vast quantity' of detailed biochemistry with a 'lack of clinical relevance' but that this led to excessive learning for examinations. The findings of this study reveals that medical doctors graduated from conventional medical schools score better than those graduated from schools adopting integrated instructional system. This may explain the above statement that amount of biochemistry is far less than in traditional course. Though, graduates from conventional medical schools attained marks better than graduates of integrated schools, this does not necessarily mean they might be ranked in a superior position in clinical practice. The basic medical sciences curricula of conventional medical schools have been a place of bitter criticism by clinical practice regulatory bodies [4]. It seems to be redundant factual overload that consumes the students' time and energy. This time spent on unnecessary details could have been better directed towards improving their skills and attributes of future doctors. Hence detailed factual biochemical knowledge taught out of clinical context will be perceived as irrelevant. The findings of this study expediting the need for reforms review of the curriculum and the way of presenting biochemistry in both conventional and integrated medical schools. The new approach to teaching biochemistry should be attractive and offers a good and deep knowledge to biochemistry for the medical student. Adopting an outcomefocused strategy must be considered in potential reforms might help in better introduce biochemistry and other basic medical sciences to medical student [5]-[6]-[7]. New activities have to be introduced to increase students' interest in biochemistry, stimulating students about it and show its applicability in their future clinical practice.

Brief biography of each author

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