Evaluation of Knowledge and Attitude among Medical Students towards Mnemonics Learning.

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ABSTRACT

Background: Many different ways exist to undertake and encourage students to improve their information and understanding of a subject matter. This study was undertaken to measure the impact of student-based mnemonic construction with multiple selection questions (mnemonics) as a stimulant for the training and understanding of topics in biochemistry. **Methods:** Medical students were selected voluntarily from various medical colleges. They were approached with a pre-validated mnemonic's with prior oriented mnemonics. Feedback questions were taken from students regarding mnemonics usage. Statistics: Descriptive statistics was used and results were expressed as percentage. **Results**: 135 students were selected from first year for this study. A set of questionnaires were place and directed to decide on the suitable possibility as per the likert scale. The response were collected and analyzed. 65% of students very much liked learning mnemonics, 54% of students expressed interest to create mnemonics before going to exams. 38% of students expressed that they were terrified with mnemonics. 67% of students felt confident with mnemonics, 57% students opined that future theory teaching should be based contain few interesting mnemonics. 71% of students felt mnemonics helped them in remembering, analysing, evaluating and understanding difficult medical concepts. **Conclusion:** The fact that the mnemonics didn't test deep learning could suggest that the students did not gain the higher levels of understanding hoped for, but this is often a difficult conclusion to make particularly because it isn't a realistic expectation for students to provide mnemonics testing higher order cognitive skills at their first try.

Keywords: Teacher assisted learning (TAL), Evaluation, Mnemonics, TALM.

INTRODUCTION

Biochemistry, like other branches of medical science is ever-changing medical subject. Not solely the ideas but teaching methodologies also are keeps on innovating. it's accepted that reviewing the teaching and evaluation methods by feedback from students and modification of methodologies consequently is incredibly necessary for the undergraduate medical teaching.[1-2] Quite some time we have a tendency of following the modified teaching (TALM-Teacher-assisted learning mnemonics) programme which contains use of mnemonics.[3-4] With a view to improvise we've got determined to urge the feedback of our teaching methodology and analysis pattern. Few studies are conducted in Indian setting relating to the feedback of teaching methodologies and evaluation strategies from medical students.[5]

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Medical students in particular are often described as "strategic learners", but in reality many become superficial learners out of necessity when faced with the seemingly boundless volume of material in today's curriculum.[6] The apparent enormity of the task might encourage learning and much of what is learnt can be rapidly forgotten once the examination or assessment task is completed. One of the challenges that the teacher faces is how to encourage a deeper understanding of the key areas of the curriculum. Multiple choice questions (mnemonics) have been a favoured method of for quick accessing student knowledge and understanding in the medical field for many years.[7-8] The high reliability and versatility of mnemonics and the ability quickly associate with efficiently has made them an oft-used tool for teaching learning in medicine.

Students are typically given assignments designed to enhance their understanding of the subject they're learning. These sorts of method assignments might vary from problem-solving exercises to project work and essay writing. Asking students to form mnemonic based on their learning material could result in a deeper understanding of the study topic than different ways. it's been urged that if students were to put in writing their own problem-solving mnemonics, they will profit by being impelled to review a topic in larger depth[10]. We have undertaken a study to measure the impact of students constructing their own mnemonic on examination performance and learning. The hypothesis to be tested was that once given a topic to analysis and compose, student understanding would be increased if they were asked to construct mnemonic based on the material under study.[11]

MATERIALS AND METHODS

Students were asked to write down their personalized mnemonics for interesting biochemistry topic with time limit of 30 minutes to complete the

task. A set of mnemonic questionnaires for same interesting biochemistry topic were was displayed in class, to assess their mnemonic skills and their involvement in use of mnemonic based mnemonic solving activities. Students were asked to use an alphabetical scoring method (A, B, C, D, E) [Table 1]. Subsequently set of students without mnemonics mnemonic questionnaires were analysed [Table 2]. First year MBBS students of 2015-16 batch participated by voluntarily in the study by responding to the questions provided to them during class. A batch of 150 students participated on 3 different days teaching class and responded to the questions.

Assessment plan: (Statistical Analysis)
Data will be entered in Microsoft excel and analysed using SPSS software version 18. The demographic data will be analyzed as frequencies, measures of central tendency and dispersion. Chi- square test and Fishers' exact test will be used to compare the data in proportions. Non-parameter tests like Mann-Whitney U test will be used. Response to questions was assessed by item analysis [Table 3].

Selection criteria
- Inclusion criteria:- medical students.(Ist and IInd phase students)
- Exclusion criteria:- non medical students, Interns , PG medical students.

Table 1: Feedback questionnaire: Fill respective alphabets-A,B,C,D& E for each 1-10 questions.

Sl. No	Questions	Likert Scale
	Do you like learning mnemonics??	A. Strongly Agree B. Agree C. Neither Agree or Disagree D. Disagree E. Strongly Disagree
	Do you like to learning mnemonics before for exams??	
	Do learning mnemonics terrified you ???	
	Do you feel confident while solving mnemonics??	
	Do you feel classes with mnemonic for teaching /learning activity should be more in the future??	
	mnemonics help you in remembering difficult concept in biochemistry ??	
	mnemonics help in understanding concepts in biochemistry	
	mnemonics help in applying biochemistry concepts in real life	
	mnemonics Help in analyzing biochemistry concepts in clinical cases?	
	mnemonic shall Help in Evaluating , creating and innovating new concepts in biochemistry	

RESULTS

Table 2: mnemonic KAP Study Responses

Question	Options & Response (n =135)			
Do you like learning Mnemonics??	Yes	No	Neither yes or no	
	60%	28%	15%	
Do you like to learning mnemonics before for exams??	Yes	No	Neither yes or no	
	66%	5%	27%	
Do learning mnemonics terrified you ???	Strongly agree	Agree	No	Neither yes or no
	25%	11%	58%	7%
Do you feel confident while solving mnemonicS??	Strongly agree	Agree	Not interested	Neither yes or no
	13%	53%	15%	17%
Do you feel classes with mnemonic for teaching /learning activity should be more in the future??	Strongly agree	Agree	No	Neither yes or no
	29%	48%	22%	7%
mnemonics help you in remembering difficult concept in biochemistry ??	Strongly agree	Agree	No	Neither yes or no
	58%	22%	10%	8%
mnemonics help in understanding concepts in biochemistry	Strongly agree	Agree	No	Neither yes or no
	31%	41%	18%	10%
mnemonics help in applying biochemistry concepts in real life	Strongly agree	Agree	No	Neither yes or no
	41%	33%	8%	16%
mnemonics Help in analyzing biochemistry concepts in clinical cases?	Strongly agree	Agree	No	Neither yes or no
	33%	54%	8%	3%
mnemonic shall Help in Evaluating , creating and innovating new concepts in biochemistry	Strongly agree	Agree	No	Neither yes or no
	40%	33%	10%	17%

Table 3: Pre test and Post Test mnemonic Results -class average score

Class	Number students	mnemonic number	Pre test score	Post test score	Topic covered
Theory 1	130	5	1.7	3.2	Thyroid function test
Theory 2	126	5	1.5	4	Liver function test
Theory 3	110	5	2.1	4.5	Renal function test

DISCUSSION

We have shown that students are quite capable of constructing quality mnemonics which fulfil the criteria of being free from ambiguity and often able to test more than mere recall of fact. This indicates that the students had a solid understanding of the mechanics of designing mnemonics and had obtained knowledge and understanding sufficient to create good and easy mnemonics. Although the students were capable of producing high quality mnemonics, the majority of the mnemonics created by them tested knowledge and comprehension. The premise of this study is that in order to create mnemonics of a high calibre, It was essential to understand bloom's taxonomy of learning as stated in below table 4.[12]

Table 4: Bloom's learning taxonomy [9]

Level	Definition
Remembering	Recalling information
Understanding	Identifying examples of a given term, concept, or principle. interpreting the meaning of an idea, concept or principle.
Applying	Using information , rules and procedures in concrete situations
Analyzing	Breaking information into parts to explore patterns and relationships. analyzing charts , data to support conclusions.
Evaluating	Justifying a decision or a course of action.
Creating	Generating new ideas or products.

Responses for Top 10 questions out of total questions are shown in Table no.1, Among 150 students 135 students participated in the study and submitted their responses, out of which male participants were 43% & female participants were 55%. Such access to such enormous information could bring about changes in the attitude of the medical student towards the goal of academic excellence and incorporating mnemonic assisted learning, which is monitored by teaching faculty, could be novel step in achieving this goal. 135 students were selected from first year for this study. A set of questionnaires were place and directed to decide on the suitable possibility as per the likert scale. The response were collected and analyzed. 65% of students very much liked solving mnemonic, 54% of students expressed interest to solve

mnemonic before going to exams. 38% of students expressed that they were terrified solving mnemonics. 67% of students felt confident solving mnemonic, 57% students opined that future theory evaluation should be based on mnemonic. 71% of students felt solving mnemonic helped them in remembering, analysing, evaluating and understanding difficult medical concepts.

Exposing students to mnemonics, as a teaching exercise ought to act as a stimulant to learning. The mnemonics probably the element of examination format within the medical curriculum, and if the students will perceive the process and means of construction of a good mnemonic, this could work to their advantage. Not only ought to it facilitate with actual examinations however, even as importantly, it will teach the distinction between mere knowledge acquisition and how that utilized is utilized in terms of comprehension, application, analysis and analysis. In reality, exercises of this nature don't seem to be likely to be greeted with much enthusiasm as they involve learning methods unfamiliar to several students, and may be perceived as an inefficient use of study time. both students and staff have to be compelled to be shown that unfamiliar methods is useful in order for them to be a lot of receptive to new learning initiatives.

It may well be the case that one of the most important strengths of an mnemonic assessment, i.e. the ability to assess a wide range of material, was one among the weaknesses of the learning strategy in this study. the students were assessed using mcq-questions to check applications of mnemotechnical, that tested a good vary of ideas, yet they solely applied their mnemotechnical style over a small set of this. The students could have gained a deep understanding of their specific area of study, however they obtained only a superficial understanding of different areas, thus showing no substantial net increase in their overall understanding. This problem could also be corrected if students are required to create a larger number of mnemonics.

CONCLUSION

The fact that the mnemonics didn't test deep learning could suggest that the students did not gain the higher levels of understanding hoped for, but this is often a difficult conclusion to make particularly

because it isn't a realistic expectation for students to provide mnemonics testing higher order cognitive skills at their first try. This concept is supported by a study conducted by Brink,[13] wherever students designed their own version of a 1-hour summational examination. These students weren't allowed to write down method, however focussed on essay and calculation queries instead. When considering teaching and learning initiatives to adopt during a curriculum it's necessary to balance the time and energy needed to provide the initiative and also the desired outcome. During this instance, the required outcome was an improvement of student knowledge and understanding and from that perspective, the exercise did not show any apparent gain. However, there were some unexpected benefits. Mnemonics are time-consuming to produce. Accuracy of content must be ensured. Relevance and importance of the material must also be considered.

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