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SHORT COMMUNICATION

ASSESSMENT OF EFFECTIVENESS OF NARRATIVE BASED DELIVERY OF CONCEPTS USING EXTENDED MATCHING QUESTION ON MYCOLOGY AMONG YEAR 1 MBBS STUDENTS.

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Abstract

Story telling or use of narratives is an easy way to teach concepts to students. It helps educators to communicate more effectively to students and enhances the understanding of concepts by students. However, it is also necessary to assess the level of understanding of the concepts taught using narratives. Extended Matching Questions is a valid and reliable assessment and hence is employed in evaluating the effectiveness of narrative based teaching and learning. The present study suggests that understanding the background of the teaching method employed and relating it to the performance of students during item analysis is important, while discriminating a good question from an easy question; rather than just using numbers/values from analysis.

Keywords: Narrative based Medicine, Extended Matching Question, Item analysis, *Sporotrichosis*

Introduction

It is understood and practiced that any Teaching/ Learning (T&L) activity needs to be assessed in a Medical course. Continuous Assessment (CA) is the key that often drives learning in the medical undergraduates. Extended Matching Questions (EMQs) are becoming popular in the recent years as they are acknowledged as valid and reliable form of assessment than multiple choice questions. EMQs test and capture the factual and applied (problem solving) knowledge of medical students in a better way, it is always necessary to explore the psychometric properties of EMQ.[1] Narrative based delivery of lectures (use of anecdotes) is popular and practiced widely by medical educationists.[2] This study uses item analysis as a measure to check the quality of EMQ and the level of comprehension in Year 1 students when narrative based delivery is used to deliver concepts.

Materials and Methods

The below EMQ in Mycology was given to Year 1 students (2012) of MBBS program at AIMST University who had four medical mycology lectures, a practical session and an interactive review session (IRS) in their teaching schedule. All the four lectures in medical mycology topics were handled by a single lecturer.

Power point presentations of lectures and rapid study notes were provided to the students after the lecture. The IRS was done in a quiz pattern with MCQs and 'Who Am I?' type of questions.[3] The 'Who Am I' is a quiz to identify a fungus with 5 clues each of which are specific for the organism. Narrative mode of delivery (story style) was used to discuss the concepts for one of the fungus - *Sporothrix schencki.*

The EMQ on mycology topics was included in the question paper of continuous assessment.[4] The aim of the assessment was to test student's acceptance towards narrative based teaching process. It is already known that students modify their learning methodologies according to the assessment tools.[5] The EMQ was vetted at unit level and later by the central vetting committee.

Theme: Mycoses

A) *Trichophyton rubrum*	F) *Microsporum canis*
B) *Microsporum gypseum*	G) *Cryptococcus neoformans*
C) *Histoplasma capsulatum*	H) *Coccidioides immitis*
D) *Candida albicans*	I) *Talaromyces marneffei*
E) *Madurella mycetomatis*	J) *Sporothrix schenckii*

Based on the clinical history, culture and microscopic characteristics in 1, 2, 3, 4 and 5 below, match the most probable aetiological agent and write the answer in the space provided. Each answer fetches 1 mark

Q1.	A green dimorphic fungus producing radially folded colonies and a red pigment on the medium and is isolated from a HIV patient.	Answer:
Q2.	A zoophilic fungus producing spindle shaped macroconidia is isolated from a moist erythematous lesion with well-defined margin on the body.	Answer:
Q3.	Encapsulated yeast cells producing brown pigment on bird seed agar are isolated from the CSF of a 6-year-old female child suffering from meningitis.	Answer:
Q4.	A dimorphic fungus producing tuberculated macroconidia is isolated from a man who has caving as avocation	Answer:
Q5.	A dimorphic, dematiaceous fungus producing a tissue form called asteroid body and is isolated from a florist	Answer:

Keys
Q1 – I, Q2 – F, Q3 – G, Q4 – C and Q5 - J

Results

Item analysis was done on the EMQ and the results are tabulated as below.

Group Statistics

The means scores and standard deviations are presented in Table 1. The number of students who gave the corrected response is recorded in Table 2. The Difficulty rank of the questions based on student's performance is tabulated in Table 3.

The discrimination index, relation between difficulty index and discrimination index and the discriminator analysis for question 5 (which was taught using the narrative) are tabulated in Tables 4, 5 and 6

Discussion

Putting the learner at the centre is pivotal in any teaching learning activity.[6] The students also spend significant time, effort in response to our assessments and therefore, we must ask whether our assessments are robust and drive our students to learn.[7]

Anecdote based delivery of concepts in teaching

In the analysis the 5th question was noted as the easiest question. A feedback session was conducted in the cohort to find the reason for the maximum students (165/194) getting the answer correct for question 5. The students remembered the concepts and had a better retention of the details about the fungi (Question 5) for which the lecturer had used a story-based delivery for *Sporothrix schenckii* topic but while the normal interactive teaching style was used for other topics on fungi (Questions 1-4 in the EMQ).

Background of Question 5

Story based delivery of Medical Science

Story based delivery of lecture keeps the audience attentive and remains in the memory over a long period of time. Narratives may serve as hooks to engage audience and as memory aid (Easton 2016). The following is an example of how a medical mycology topic was taught to Year 1 medical students with an anecdote.

Sporothrix schenckii

*There lived a girl called **schenckii** (The teacher asks the students, is schenckii a nice name for a girl). Usually, it is a mixed response for that question. This girl is fond of roses and daisies. Of course, most girls are fond of roses and daisies. The teacher raises the curiosity of the students by asking them, "When you think of a rose, what do you think of?" (response from students, think of love… think of beauty, think of happiness etc). So if you think of rose you think of love, but it may not be happy moments always.. sometimes it hurts right? Students respond Yes, yes! So, when you think of a rose, you also think of a thorn, so when you think of a thorn you also think of the getting (hurt) pricked. Now it's time for the lecturer to let the students know that Sporothrix schenckii is a fungus, it is on the rose plants and can be acquired by pricking of a thorn (now explain the mode of acquisition and the common name for the disease, Sporotrichosis - rose handler's disease or rose thorn disease). At this point, the teacher also explains that all sub-cutaneous infections are acquired by traumatic implantation (a pricking of thorn or a sharp object). Then ask why schenckii likes daisies and explain that the fungus has a conidial arrangement similar to daisy flowers (shows picture). Beautiful girl, schenckii has a pet cat named 'Scratch' (relate the risk of contact with infected cats that carry a high zoonotic risk for sporotrichosis).*

The teacher tells the students, when we talked about love, 'I saw the stars in your eyes' (relate the star to the asteroid body, the tissue form of Sporothrix schenckii, also a diagnostic key-shows picture)

The teacher concludes by saying love has a bright side and a dark side. The colour of the colony is white initially (bright side) and may change colour over time to become cream to dark brown (dark side). Now as he discusses about the dark brown colour of the colony, introduce the term dematiaceous fungi (darkly pigmented fungi).

*In a later lecture on the management of Sporothrix schenckii, the students were told that most of the time, the solution is available within the problem. After making them curious it was told that Pottasium Iodide (KI) is a treatment option that is embedded in the word schenc***ki***i*

Conclusion

Item analysis provides valuable information to the teachers to further item modification and future test development and offers educational tools to assist them.[2] In the item analysis for question 5, the analysis says the distractors are non-functional. It is always essential to analyse the true background of teaching and assessment before concluding on just numbers. If the feedback session was not conducted with the

students to find that the narrative based delivery helped them to easily find the correct answer, we would have easily brushed this question aside in the next assessment either as 'easy question' or would have advised 'to change the distractors'. Hence it is always important to judge a question comprehensively taking all aspects of T&L strategy into consideration. Since all the mycology lectures were taught by the same lecturer in the current study, the question on difference in teaching as a reason for better performance on a particular question can be eliminated. From this study, we can conclude that narrative based delivery of concepts reach the students better and the item analysis should include the holistic understanding of T&L activities, rather than just depending on numbers to discriminate a good question from a bad question.[8] However, it needs a lot of creativity for the lecturers to come out with specific anecdotes/narratives to the respective topics.

Conflict of interest

There is no conflict of interest in this study.

The narrative on *Sporothrix schenckii* is original creation of the first author.

In the narrative, the word *schenckii* is personified to a girl, however only lower case was used intentionally to insist that species name is written in lowercase.

Table 1. The mean scores and the standard deviations

Group	No: of students	Mean scores	Standard Deviations
All	194	2.66	1.42
Lower	65	1.08	0.67
Middle	64	2.67	0.47
High	65	4.23	0.48

Table 2. Number of students in the class who gave correct response

Question No:	Q1	Q2	Q3	Q4	Q5
No: of students given correct response	71	60	118	102	165
KEYS	I	F	G	C	J

Table 3. Difficulty rank (least to most difficult) and item number

Difficulty index = < or = 30% = difficult, >30% - 69% = medium, = or > 70% = easy

Difficulty rank	All	Low	Middle	Upper
			Difficulty Index	
1. Q5	85.05 (E)	64.6 (M)	90.63 (E)	100.0 (E)
2. Q3	60.82 (M)	16.92 (D)	73.44 (E)	92.31 (E)
3. Q4	52.58 (M)	10.77 (D)	57.81 (M)	89.23 (E)
4. Q1	36.60 (M)	9.23 (D)	26.56 (D)	73.85 (E)
5. Q2	30.93 (M)	7.69 (D)	17.19 (D)	67.69 (M)

As per the students' performance Q2 is the most difficult question (Is it difficult because of bad construction of the question or poor understanding on concepts?) and Q5 is the easiest Question (The possibility of better performance may be due to easy to guess the answer or excellent teaching or any other factor)

* D=Difficulty level high, M=Medium level difficulty, E= Easy

Table 4. Discrimination Index

Poor = <0.1, fair = 0.1 - 0.3, good = > 0.3

Discrimination Index	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**
	0.65	**0.6**	**0.75**	**0.78**	**0.35**
Rank (lowest to highest)	**3**	**2**	**4**	**5**	**1**

** All questions have good discrimination

Table 5. Relation between difficulty index and discrimination index

Questions	**Difficulty Index**		**Discrimination Index**		**Decision**
Q1	Medium	36.60	Good	0.65	Accept
Q2	Medium	30.93	Good	0.60	Accept
Q3	Medium	60.82	Good	0.75	Accept
Q4	Medium	52.58	Good	0.78	Accept
Q5	Easy	85.05	Good	0.35	OK

Table 6. Distracter Analysis for Question 5

	Low	Middle	High	
A	4	1	0	5
B	3	0	0	3
C	1	1	0	2
D	2	2	0	4
E	1	0	0	1
F	2	0	0	2
G	4	0	0	4
H	3	2	0	5
I	3	0	0	3
J	42	58	65	**165**
				194

Q 5 – easy item – distracters - non-functioning

In the distractor analysis, it was found that only for Question 5, the distractors were not working effectively

References

1. Chandratilake M, Davis M, Ponnamperuma G. Assessment of medical knowledge: the pros and cons of using true/false multiple choice questions. Natl Med J India. 2011 Aug;24(4):225–8.
2. Arjmand S. The Use of Narrative in Medical Education. Journal for Learning through the Arts [Internet]. 2012 [cited 2021 Mar 25];8(1). Available from: https://escholarship.org/uc/item/1b95d8vv
3. Easton G. How medical teachers use narratives in lectures: a qualitative study. BMC Med Educ. 2016 Jan 7;16:3.
4. Aftab MT, Tariq MH. Continuous Assessment as a Good Motivational Tool in Medical Education. Acta Med Acad. 2018 May;47(1):76–81.

5. Rezigalla A, Abdalla A, Mutwakil H, Alhassen M, Abbas M. Students' Perceptions Toward Continuous Assessment in Anatomy Courses. Journal of Medical Sciences and Health. 2017 Jul 25;3.
6. OECD. Student assessment: Putting the learner at the centre. In: Synergies for Better Learning [Internet]. OECD; 2013 [cited 2020 Dec 21]. p. 139–269. (OECD Reviews of Evaluation and Assessment in Education). Available from: https://www.oecd-ilibrary.org/education/synergies-for-better-learning/student-assessment-putting-the-learner-at-the-centre_9789264190658-7-en
7. Scott IM. Beyond 'driving': The relationship between assessment, performance and learning. Medical Education. 2020;54(1):54–9.
8. Odukoya JA, Adekeye O, Igbinoba AO, Afolabi A. Item analysis of university-wide multiple choice objective examinations: the experience of a Nigerian private university. Qual Quant. 2018 May;52(3):983–97.