Original Article

A Novel Teaching Learning Methodology in Medical Education : Personification (Role Play) in Biochemistry – A Pilot Study

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Abstract

Background : The perception of Biochemistry among medical Undergraduates is that it is dry and uninspiring, with retention of the subject being the least as a medical student progresses to a medical Graduate. To change this perception and make the subject more interesting, it was decided to experiment with role-play and develop a new Teaching-Learning Methodology - Personification.

Aims and Objectives : To introduce the concept of personification in biochemistry and assess the response of the undergraduates.

Materials and Methods : The topic chosen was Heme Synthesis and study of Porphyrias. The day before class, each student was given a role of products, enzymes, cofactors, and all other factors involved in Heme Synthesis. Each student was asked to be prepared to talk two lines about their assigned role on the topic, for eg, Uroporphyrinogen decarboxylase and also had a placard informing others of their role. The students spoke as per the order of involvement in the cycle and deficiencies of factors and enzymes were also discussed. Ultimately, feedback was collected from the undergraduates and analyzed.

Results : In 43.2% found the concept of role-play somewhat useful in understanding Heme Synthesis. In 41.1% understood porphyrias very clearly with this method. 42.1% expressed the desire to have future classes similarly.

Conclusion : Even though the Undergraduates were introduced to personification for the first time, it aroused their curiosity and ensured their involvement in the process of learning. More metabolic cycles need to be taught using personification for an in-depth analysis of this method. Moreover, feedback from faculty should also be included in the future.

Key words : Role Play, Personification, Medical Education, Biochemistry.

The perception of Biochemistry among medical Undergraduates is that it is dry and uninspiring with retention of the subject being the least as a medical student progresses to becoming a medical Graduate even though it was felt that the knowledge of Biochemistry is important as a medical professional[1,2]. In a bid to change this perception and to make the subject interesting, it has become imperative to develop new innovative methods for teaching Biochemistry. Role play is one such teaching learning methodology which has traditionally been utilized by clinical subjects for displaying doctor patient interactions and even various forms of communication with positive outcome[3,4]. The aim of the project is to make Biochemistry more relatable and real as here each student will impersonate a metabolite/ enzyme. This would remove the abstract feeling that a medical student perceives while learning metabolic cycles. It will create an interactive learning process with enhanced retention and understanding. Hence, it is a felt need to try to experiment with this method as few medical educators have utilized this teaching methodology in the field of Biochemistry with positive outcomes[5]. To develop and implement this novel method of Teaching Learning Methodology - Personification, it was imperative to conduct a pilot study to determine the acceptability among Undergraduates.

Editor's Comment :

- Personification (Role Play) can become an important tool for teaching Biochemistry as it involves the learner and makes learning easy.

Materials and Methods

The topic of Biochemistry chosen as per CBME was

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'Describe the functions of Heme in the body and describe the processes involved in its metabolism and describe Porphyrin metabolism' in which Heme Synthesis and study of Porphyrias was selected. The day before class, each student was given a role of products, enzymes, cofactors and all other factors involved in Heme Synthesis. Each student was asked to be prepared to talk two lines about their assigned role in relation to the topic, for eg Uroporphyrinogen decarboxylase and also had a placard informing others of their role. The students spoke as per the order of involvement in the cycle and deficiencies of factors and enzymes were also discussed. Simultaneously the topic of Jaundice was selected from the CBME 'Describe different types of Anaemias & Jaundice' to be taught as Case-based Learning and Haemoglobinopathy was selected from the CBME 'Describe the major types of Haemoglobin and its derivatives found in the body and their physiological/ pathological relevance' to be taught as Seminar wherein students prepared and presented the same with guidance of faculty. At the end, feedback was taken from the Undergraduates and analyzed. The feedback was taken after the lecture in the form of a google survey form with the responses on a Likert Scale.

Results

In 70.5% found the class good/excellent as against 29.5% who found the class fair to poor (Fig 1). 36.8% found the topic of Jaundice taught by case based learning the best as compared to 32.6% who found all three topics taught by different methodologies acceptable. However, on direct questioning 54.7% found case based learning the best as against 21.1% who found all three methods acceptable. 43.2% found the concept of role-play somewhat useful in understanding Heme synthesis as against 23.1% who did not find it useful (Fig 2). 41.1% understood Porphyrias very clearly with this method as against 15.8% who did not understand the topic by this method (Fig 3). In 42.1% expressed the desire to have future classes similarly.

Discussion

Biochemistry is a basic science subject which is the part of first MBBS and is taught for one year in India. It forms the foundation on which the future knowledge acquired during the next three and a half years is built. It is one of the key subjects on which a clinical diagnosis is based[6]. Traditionally, the different teaching methods utilized for learning Biochemistry are traditional lectures, PowerPoint presentations, whiteboards, tutorials and practicals. These traditional teaching methods allow for a monologue from the teachers end with no input from the learner's side, causing the learner to lose the learning initiative and creativity[7]. With the advent of Competency-based Medical Education, the different teaching-learning methods advocated are Lecture cum Demonstration, Laboratory experiments, Case study, Mastery Learning, Creative projects, Small group discussions, Tutorials Simulation, Self-directed Learning and Roleplay[8]. Most of the methods mentioned above are already being implemented in Departments of Biochemistry across the country as mandated by NMC in its curriculum. Role play is one of the methods which has rarely been used[5] for teaching Biochemistry. It has routinely been utilised by clinical specialities to demonstrate and develop patient doctor interactions and promotes and improves communication skills[3,4]. Role play is a teaching strategy which encompasses active learning and promotes critical thinking. It is an activity which engages learners cognitively and effectively and allows them to work together to resolve issues. The

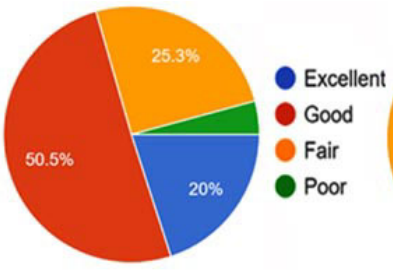

Fig 1 — Overall, how would you rate the class? (95 responses)

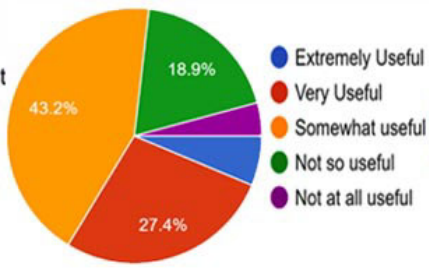

Fig 2 — How useful was the role play in making cycle of heme synthesis interesting? (95 responses)

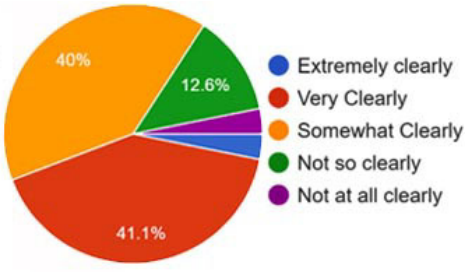

Fig 3 — How clearly were you able to understand porphyrias? (95 responses)

learners role play will interact with different persons and share information collaboratively which will remove the ambiguities and inaccuracy of concepts[9]. In the present pilot study, an attempt was made to introduce the concept of Personification and simultaneously other methodologies were also used to determine the acceptability of this novel method. This study was primarily a sensitisation of the Undergraduate students to the concept of Role Play and Personification. In this maiden attempt at implementation of the method of personification, 41.1% of Undergraduate students (Fig 3) expressed increased understanding. This was positive feedback which motivates the faculty to further streamline the method and to implement it in other metabolic cycles. 43.2% found the concept of role-play somewhat useful in understanding Heme Synthesis implying the acceptability of this novel method among Undergraduates (Fig 2). 42.1% of Undergraduates expressed the desire to have future classes similarly. A drawback of this study was that feedback of the faculty was not included. It would be important to determine the usefulness of this novel method of personification from the faculty's point of view.

Conclusion

Even though the Undergraduates were introduced to Personification for the first time, it aroused their curiosity and ensured their involvement in the process of learning. More metabolic cycles need to be taught using personification for an in-depth analysis of this method. Moreover, feedback from faculty also should be included in the future.

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Conflict of Interest : None

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