

Perceptions of students regarding innovative approaches introduced in nutrition and metabolism module at Shifa college of medicine

Iqra Anwar,¹ Sumreena Mansoor,² Saima Saeed,³ Sajid Rashid⁴

Abstract

Objective: To assess the perceptions of 2nd year medical students regarding certain approaches introduced in the course of Nutrition and Metabolism module.

Method: The descriptive study was conducted at the Shifa College of Medicine, Islamabad, Pakistan, in December 2020, and comprised all 2nd year medical students who completed the Nutrition and Metabolism module in which new components had been added, including introduction to community nutrition, school visits, Islamic perspective of nutrition, journal club and e-posters. Data was collected using a questionnaire based on the modified Dundee Ready Education Environment Measure, and had 5 categories with a total of 25 questions that were scored on a 5-point Likert scale. Data was analysed using SPSS 22.

Results: Of the 100 students, 65(65%) were females and 35(35%) were males. The overall mean age was 20.5 ± 0.5 years. The total mean score was 74.68 ± 2.53 . Mean score for student's perception of learning was 38.17 ± 0.17 , student's perception of teachers 9.27 ± 0.18 , student's academic self-perceptions 12.1 ± 0.11 , student's perceptions of atmosphere 9.03 ± 0.03 and student's social self-perceptions 6.11 ± 0.01 .

Conclusion: The perceptions medical students about innovations were positive, showing an encouraging attitude in terms of learning approach and outcome.

Keywords: Educational environment, Problem-based learning, DREEM, Innovations, Shifa college.

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Introduction

Nutrition and metabolism¹ are key components of the Clinical Biochemistry curriculum. They form the basis of all the metabolic processes occurring at the cellular level in the human body, and it is necessary for medical students to correlate it clinically for a better understanding at an earlier level. Innovative curriculum development² leads to a learning experience with substantially better learning outcomes. Such innovations in the course of Nutrition and Metabolism are essential for strengthening students' knowledge of the subject matter, and their ability to correlate the theoretical knowledge with the clinical. It is also imperative to assess the outcomes to be sure of the efficacy of such interventions. The Dundee Ready Education Environment Measure (DREEM)³ is a well-known, highly reliable diagnostic inventory based on a 50 statement questionnaire used to assess the students' perceptions about the educational environment. However, the questions in the 5 domains already

established through DREEM need certain amendments according to the specific modalities introduced by an institution.^{4,5}

A number of studies have been conducted based on DREEM which assessed the students' perceptions regarding the educational environment in medical schools. However, to our knowledge, no study has yet been done either in relation to nutrition and metabolism module or the biochemistry curriculum on the basis of DREEM or modified DREEM criteria.

The current study was planned to fill the gap by assessing the perceptions of medical students regarding certain approaches introduced in the relevant course module.

Subjects and Methods

The descriptive study was conducted at the Shifa College of Medicine (SCM), Islamabad, Pakistan, in December 2020. After approval from the institutional ethics review committee, the sample was raised using non-probability convenience sampling technique. Those included were 2nd year medical students of either gender who had completed the Nutrition and Metabolism module in which new components had been added. Informed consent was obtained from all the subjects and those who refused to participate were excluded. The new course

¹Department of Biochemistry, Islamic International Medical College, Islamabad, ^{2,3}Department of Biochemistry, Shifa College of Medicine, Islamabad, ⁴Department of Surgery, Rawalpindi Medical University, Rawalpindi, Pakistan.

Correspondence: Sajid Rashid. Email: surgeonrsajidrashid@gmail.com

ORCID ID. 0000-0002-0896-060X

components included introduction to community nutrition, school visits, Islamic perspective of nutrition, journal club and e-posters.

Introduction to community nutrition⁶ helps in the promotion of good health through food and nutrient intake at the community level. This enables the students in developing competencies for public health and community nutrition programmes.⁷ School visits under the supervision of Community Medicine Department were arranged for the students in which they interacted with children and got to know about the common health problems present among school-going children related to poor nutrition, and nutritional counselling was also done. Based on this insight, the students were expected to be able to understand the nutritional problems of all age groups and guide them, especially the vulnerable groups, in their professional lives. Working at the community level in the field through school visits broadened their exposure and the students were able to practice the skills incorporated in the module, like general physical examination, anthropometry, growth charts and body mass index (BMI) calculation on the general population.

Nutritional counselling⁸ along with the making of diet plans with special emphasis on physiological stress needing high nutritional demands, like during pregnancy and lactation phases, was introduced for the development of knowledge, competence and the ability to address nutrition problems. Large-group interactive sessions were scheduled in which nutritional needs during pregnancy and lactation were highlighted. Sessions in the form of small batches were incorporated in which students practised nutritional counselling in the form of role plays.

The introduction of the Islamic perspective of nutrition⁹ in the curriculum was aimed at highlighting the importance of a healthy diet and the concept of maintaining equilibrium with respect to our religion. Ethical issues regarding genetically modified food¹⁰ along with its pros and cons were discussed with the students in the form of large-group interactive sessions.

The idea of the journal club¹¹ is to introduce the element of research. This helps the students in understanding the concept of literature search and article review.¹² The article selected was based on the use of artificial intelligence (AI) for weight-loss among overweight and obese adults. The article was provided beforehand to the students and was discussed in detail in small group discussion (SGD) sessions.

Besides, e-posters¹³ were assigned to the students in 16

groups with proper prior guidelines each having a different topic and at the end of the module all the groups presented their e-posters. The focus of all the topics assigned were to inculcate the principles of nutritional management of various metabolic and nutritional disorders. This encouraged the students' minds towards creativity and innovation in today's growing digital and research-oriented world, and broadened their horizons with reference to international conferences.¹⁴

Problem-based learning (PBL),¹⁵ a well-known approach, was also incorporated in this module in order to impart knowledge regarding enteral and parenteral nutrition. For this purpose, both the departments of Basic Sciences and Clinical Sciences¹⁶ collaborated to formulate a clinical case scenario. Two PBL sessions were conducted with a gap of 1 week, followed by a final session where all the batches wrapped up the case scenario in the form of power point presentations.

Formative quiz was also incorporated in order to encourage the students to actively participate and to get acquainted with team management skills without the fear of marks (weightage) in their final exam of the module.

A modified criterion based on DREEM was used for data collection and assessment. Originally, DREEM is a 50-statement questionnaire divided into five categories; student's perception of learning (SPL), student's perception of teachers (SPT), student's academic self-perceptions (SASP), student's perceptions of atmosphere (SPA), student's social self-perceptions (SSSP).¹⁷ The modified DREEM comprised 25 items spread over the same 5 domains. It was scored on a 5-point Likert scale from 0=strongly disagree to 4=strongly agree. The broad domains were kept the same as the original DREEM questionnaire which is already a validated instrument. Modifications were done systematically while keeping the main structure of the criteria intact. Changes were done in the items according to Biochemistry subject's requirement in terms of learning innovations. For instance, in the SPL domain, items were based upon students' perception regarding case-based learning, journal club initiation, nutritional counselling sessions along with ethical issues related to genetically modified food, community visits and e-posters. In the SPT domain, items were amended on the basis of students' perception regarding teaching skills and methodologies. In SASP, students' perception were assessed on the basis of the academic progress made by imparting the innovative strategies. In SPA, students' perception regarding the learning environment were assessed, while in SSSP, students' perception regarding their active participation during sessions was assessed. On the other hand, the

items in the original DREEM criteria were based entirely upon the learning environment. Post-modification, there were 13 questions in SPL, 3 in SPT, 4 in SASP, 3 in SPA and 2 in SSSP. The maximum total score of all the 5 categories was 100 (25 × 4) wherein 0-25, 25-50, 50-75 and 75-100 interpreted as very poor, plenty of problems, more positive than negative and excellent respectively. Mean scores of each question was calculated for all the students. Percentages were calculated for each domain by adding all the means and dividing them by the total of all mean scores of questions. Scoring of each domain was then compared with the guide for domain score (Figure). Face validity of the questionnaire was done by a professor and an assistant professor from the Biochemistry Department since majority of the content of the module was from Biochemistry.

The questionnaires were distributed by one of the researchers at the end of the module. Each questionnaire took 5-7 minutes to be filled and was collected by the same researcher. After the collection of the questionnaires, each participant was allotted a specific

number to maintain confidentiality. Data was analysed using SPSS 22.

Results

Of the 100 students, 65(65%) were females and 35(35%) were males. The overall mean age was 20.5 ± 0.5 years. Highest mean score was 3.29±0.18 for item 16 (Table-1)

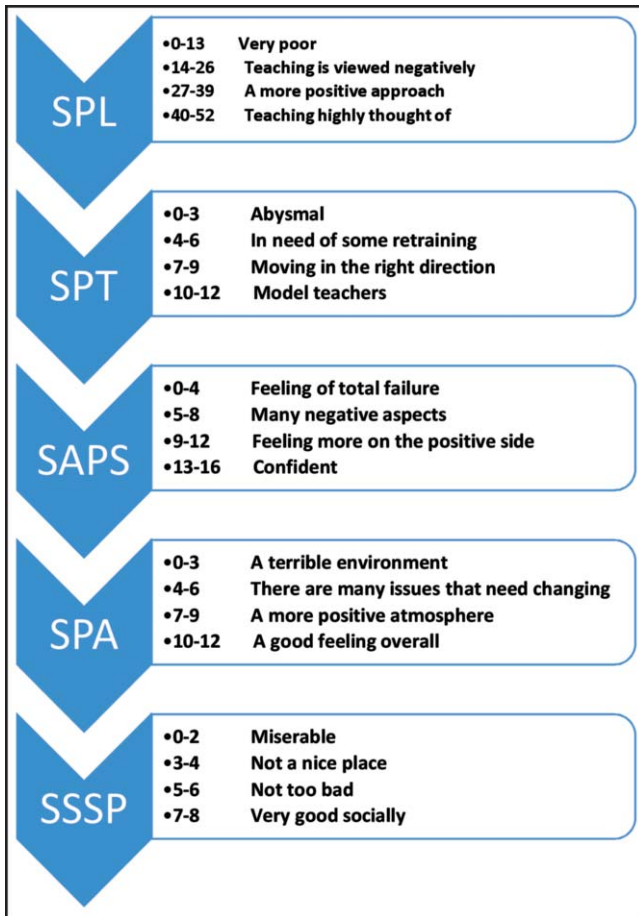
The total mean score was 74.68±2.53. Mean score for

Table-2: Total mean score of the five Dundee Ready Education Environment Measure (DREEM) subclasses.

Domain	Total Score	Percentage
Students perception of learning (SPL)	38.17 / 52	73.04 ± 0.17
Students perception of teachers (SPT)	9.27 / 12	77.25 ± 0.18
Students academic self-perception (SASP)	12.1 / 16	75.625 ± 0.11
Students perception of atmosphere (SPA)	9.03 / 12	75.25 ± 0.03
Students social self-perception (SSSP)	6.11 / 8	76.375 ± 0.01
Total	74.68 / 100	74.68 ± 2.53

Table-1: Individual scores of all 2nd year medical students across all Dundee Ready Education Environment Measure (DREEM) domains (n=100).

No.	Student's Perception of Learning	Mean Score
1	I am being able to correlate the metabolic processes clinically.	2.79± 0.17
2	Introduction of community nutrition will help me in understanding nutritional issues at community level.	2.91± 0.17
3	Initiation of Islamic perspective of nutrition is making us equipped to tackle the health care needs of our society.	2.69± 0.17
4	The practical/SCIL sessions helps in the inculcation of basics of clinical medicine.	3.02± 0.17
5	Case based learning promotes critical thinking and approach towards provisional diagnosis.	3.21± 0.17
6	Introduction of parenteral nutrition and its clinical significance through PBL enabled me to channel my knowledge clinically at an early stage.	3.07± 0.17
7	Practicing skills at community level during school visits strengthened my skills.	3.04± 0.17
8	Nutritional counseling as real life physician augmented my communication skills.	3.11± 0.17
9	Initiation of e-posters is a useful step in encouraging active learning.	2.68± 0.17
10	Discussion about ethical issues related to genetically modified food is helpful in enlightening its effects on health.	2.84± 0.17
11	Introduction of nutritional disorders with emphasis on obesity as a disease seems relevant to health care career in our society.	3.14± 0.17
12	Initiation of journal club is a good initiative towards research introduction.	2.69± 0.17
13	Formative quiz promotes active participation and healthy competition.	2.98± 0.17
	Student's Perception of Teachers	
14	The course coordinators adopted patient centered approach while designing the curriculum.	2.84± 0.18
15	The teachers were well aware of the new approaches introduced.	3.14± 0.18
16	The skills taught in the practical sessions were well prepared by the instructors.	3.29± 0.18
	Student's Academic Self-Perceptions	
17	New learning strategies introduced work well for me in addition to the previous ones.	2.86± 0.11
18	With the help of PBL, my problem solving skills have been improved.	3.04± 0.11
19	Formative quizzes and mini test helps me in memorizing the course content.	3.02± 0.11
20	Patient counselling helped me in developing empathy.	3.18± 0.11
	Student's Perceptions of Atmosphere	
21	The course content was accurately timetabled.	2.77± 0.03
22	Learning environment was comfortable and motivating during lectures and SGDs.	3.07± 0.03
23	I was given full opportunity to ask questions and clear my queries.	3.19± 0.03
	Student's Social Self-Perceptions	
24	The faculty provides an open door policy for the students who are stressed or facing any problem.	2.96± 0.01
25	The fellow students encourage each other and constructive criticism is also appreciated during SGDs.	3.15± 0.01



SPL: Student's perception of learning, SPT: Student's perception of teachers, SASP: Student's academic self-perceptions, SPA: Student's perceptions of atmosphere, SSSP: Student's social self-perceptions.

Figure: Dundee Ready Education Environment Measure(DREEM) domain score interpretation.

student's perception of learning was 38.17 ± 0.17 , student's perception of teachers 9.27 ± 0.18 , student's academic self-perceptions 12.1 ± 0.11 , student's perceptions of atmosphere 9.03 ± 0.03 and student's social self-perceptions 6.11 ± 0.01 (Table-2).

Discussion

The current study aimed at determining how the students experienced their educational environment. For an optimal study environment, teachers as well as students along with the social atmosphere play an integral part.

The total mean score was 74.68 ± 2.53 which was higher compared to studies conducted in India¹⁸ and Canada.¹⁹ But it was lowered as compared to the studies conducted in Australia²⁰ and Sweden.²¹ However, the earlier results were based on the established DREEM criteria rather than a modified one as was the case in the current study.

The overall score in the current study range 51-75 which was more positive than negative. Highest percentage was obtained for the SPT domain (77.25%) and the lowest for the SPL domain (73.04%) which depicted that the students were more satisfied with the teaching methods and learning strategies, which was in line with a study carried out in India. The rest of the domains were better compared to those reported by an earlier study.²²

In the SPL domain, item 5 scored highest which depicted that the students were more receptive to student centric clinical-based strategies.

Items 3, 9 and 12 were scored among the lowest which showed lesser inclination towards these relatively newer approaches. The elements of e-posters and the journal club demanded more creativity from the students which played a transitive role from traditional learning to active learning along with research introduction. This was probably one of the reasons behind their lesser interest.

In the SPT domain, item 16 was scored the highest by the students which showed satisfaction with teaching methodology. Item 14 was scored relatively lower in this domain. There might be a possibility that uniformity among the instructors while inculcating the patient-centric approach in the subject matter was variable.

In the SASP domain, item 20 was scored the highest that portrayed a positive impact of counselling sessions introduced in the module. Item 17 was scored relatively lower which might be due to lesser adaptability on students' part related to newer strategies.

Formative quiz and mini-tests received a positive response, indicating students' satisfaction towards timely and action-oriented feedback. PBL also received a positive response indicating motivation in terms of autonomous learning and group work.

In the SPA domain, item 23 received the highest score which indicated an open, insightful and congenial environment for students' queries. Item 21 received relatively lower score, indicating there was a margin of improvement in terms of time slots provided for this module of 4-week duration.

The limitation of the current study is that it was done at a single centre. Due to non-uniformity of curriculum and its delivery mechanism, however, it was not possible to carry out the study in different medical institutions.

Conclusion

Total score indicated that the students perceived the

innovations positively, showing an encouraging response towards learning approach, outcome and attitude.

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Conflict of Interest: None.

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