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ASSESSMENT OF ATTITUDE AND APPROACH ADOPTED FOR STUDYING BIOCHEMISTRY AMONGST FIRST YEAR MBBS STUDENTS

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ABSTRACT

Background: The subject of biochemistry is taught in the first year of MBBS course. It is a subject required as an aid to understand the health and disease status of the patients in clinical studies and during medical practice. Considering the immense importance of the biochemistry subject in the future of the medical students, a feedback from the 1st MBBS students dealing with the subject would be directional. Hence the present study was undertaken at PIMS-DU with second semester of first year MBBS students as participants. **Aims and Objectives**: 1) To assess the attitude and approach of first year MBBS students towards the subject of biochemistry 2) Ascertain whether the medical students were informed adequately at the beginning of the course. **Materials and Method:** The participants of the study were first year MBBS students who are in the last month of their second semester. The questionnaire was administered amongst the students present on the particular day of study. The written responses to a 21-points questionnaire were analyzed on a Microsoft Excel Spreadsheet and descriptive analysis was done. **Results:** Majority of the first year MBBS students belonged to urban and semi-urban areas. metabolism was considered as the most difficult topic. The medical students had sufficient knowledge regarding the subject of Biochemistry. Their attitude and approach was analyzed towards the subject considering the minute details. **Conclusions:** The attitude and approach of the students of first year MBBS towards biochemistry was found to be commendable. However there is scope for further improvisation.

KEYWORDS: Biochemistry, attitude, approach, medical student

INTRODUCTION

Anatomy, physiology and biochemistry are the 3 main subjects taught at 1st MBBS level for 2 semesters [1]. Across the globe biochemistry is taught in the first phase of undergraduate medical curriculum [2]. Knowledge of biochemistry can be applied to health and disease so as to understand, solve, diagnose clinical problems and helps in decision making by the doctors in clinical scenarios [3]. This fulfills the actual aim of medical curriculum that is to assimilate knowledge and skills in different disciplines and later aptly apply for the benefit of the patients and society in general [4].

The medical educationist have been reforming continuously the educational programs and teaching strategies so as to ensure that students are "actively learning" and have a lifelong dedication towards self-directed learning. The medical students should not be involved in just memorizing facts but in meaningful or dedicated learning. Dedicated or meaningful learning involves recall of knowledge from different starting points, well integrated previous knowledge as well as utility and culmination of facts gained to the meaningful conclusion for diagnosis and planning treatment for the patient [5, 6].

Medical students often perceive biochemistry as a tough subject in the 1st MBBS curriculum. These students often tend to have a superficial approach rather than a thorough approach that is an approach with eye for details and clinical implications.

Consequently it is obligatory on the part of teachers to motivate the medical students towards thorough understanding and learning of the subject of Biochemistry prescribed in the medical curriculum [7].

The syllabus prescribed for the subject of biochemistry at Pravara Institute of Medical Sciences- Deemed University, Loni (Maharashtra) to be taught to the first year MBBS students involves 240 teaching hours. It is further sub classified into 120 hours of didactic lectures, 20 hours tutorials, practicals or demonstrations 80 hours, seminars/monthly tests/revision class 20 hours as per MCI guidelines.

Student's feedback taking is a common, simpler, economical and valid method for accumulation of data on the quality of teaching and its impact on student learning. As a result both teachers and students are the direct beneficiaries. It is challenging role for all medical college teachers teaching first year MBBS students to impart maximum knowledge and thereby also ensure that it is retained by students till they start clinical practice and thereafter as doctors serving the patients and society [2].

The present study was undertaken to assess the attitude and approach of first year MBBS students towards the subject of biochemistry. It was also considered worthy to study whether the first year medical students were informed adequately about the subject of biochemistry before the start of the course.

MATERIALS AND METHODS

Study design:

The study design is a questionnaire based, cross-sectional, exploratory study.

Ethics:

Prior to the study permission was sought and therefore approved by the Institutional Ethical Committee by approval no PIMS/RMC/2015/98.

Sample size:

All first year medical students (n=97) that is 42 boy students and 55 girl students in the second semester of first year MBBS course of batch 2014-2015 of our college.

Inclusion criteria: studying Biochemistry as a part of MBBS curriculum in first years.

Methodology

On the day of administering the questionnaire only the medical students who were present were considered. The questionnaire which was self- developed, multiple-choice and with close ended 21 questions was used as tool. The questionnaire would enable to probe into the knowledge, attitude and approach of the medical students towards the subject of Biochemistry.

STATISTICAL ANALYSIS

The results of this questionnaire-based, cross-sectional, exploratory study were analyzed on the Microsoft Excel Spreadsheet, the data was summarized as percentages and descriptive analysis was done.

RESULTS

TABLE 1. Residential status (Hometown) of first year MBBS students

Residential status (Hometown)	% Boys (n)	% Girls (n)
Urban	69.04 % (29)	85.45 % (47)
Rural	11.90 % (05)	3.63 % (02)
Semi-urban	19.05 % (08)	10.90 % (06)

TABLE 2. Most difficult topic in the subject of Biochemistry according to first year MBBS students given gender wise

Most difficult topic in Biochemistry	% Boys & number	% Girls & number
Chemistry	16.66 % (07)	20.00 % (11)
Metabolism	61.90 % (26)	50.90 % (28)
Clinical Aspects	2.38 % (01)	5.45 % (03)
Case studies/Applied Questions	11.90 % (05)	18.18 % (10)
Genetics/Molecular Biology	7.14 % (03)	5.45 % (03)

***(Figures in parentheses indicates absolute numbers)**

TABLE 3. Knowledge of first year MBBS students about various aspects of Biochemistry subject given gender wise

BOYS RESPONSES IN PERCENTAGES & NUMBERS					
Knowledge about various aspects	**Chemicals in the laboratory**	**Spots kept for identification**	**Exam pattern of theory informed well in advance**	**Exam pattern of practicals informed well in advance**	**Syllabus explained well in advance**
YES	85.71 % (36)	83.33 % (35)	95.24 % (40)	88.09 % (37)	83.33 % (35)
NO	0.00 % (0)	11.90 % (05)	0.00 % (0)	7.14 % (03)	2.38 % (01)
NOT SURE	14.28 % (6)	4.76 % (02)	4.76 % (02)	7.14 % (03)	14.29 % (06)

† (Figures in parentheses indicates absolute numbers)

TABLE 4. Girls Responses in Percentages & Numbers

Knowledge about various aspects	**Chemicals in the laboratory**	**Spots kept for identification**	**Exam pattern of theory informed well in advance**	**Exam pattern of practicals informed well in advance**	**Syllabus explained well in advance**
YES	85.45 % (47)	81.82 % (45)	94.54 % (52)	94.54 % (52)	81.81 % (45)
NO	12.72 % (07)	1.81 % (01)	0.00 % (0)	1.81 % (01)	3.63 % (02)
NOT SURE	1.81 % (01)	16.36 % (09)	5.45 % (3)	3.63 % (02)	14.54 % (08)

‡ (Figures in parentheses indicates absolute numbers)

TABLE 5. Attitude of first year MBBS students regarding Biochemistry subject depicted gender wise

ATTITUDE	**Gender**	**Percentage & number distribution**					
		Almost Always	**Always**	**Frequently**	**Half of the times**	**Sometimes**	**Rarely**
Seeking additional information about class topics	**BOYS**	2.38 % (01)	7.14 % (03)	23.80 % (10)	11.90 % (05)	45.23 % (19)	9.52 % (04)
	GIRLS	10.90 % (06)	3.63 % (02)	12.72 % (07)	14.55 % (08)	43.64 % (24)	14.55 % (08)
Prior preparation before attending a class	**BOYS**	0.00 % (0)	2.38 % (01)	9.52 % (04)	11.90 % (05)	50.00 % (21)	26.19 % (11)
	GIRLS	0.00 % (0)	5.45 % (03)	7.27 % (04)	3.63 % (02)	27.27 % (15)	56.36 % (31)

Aiming to gain maximum knowledge	**BOYS**	16.66 % (07)	28.57 % (12)	38.09 % (16)	9.52 % (04)	4.76 % (02)	2.38 % (01)
	GIRLS	10.90 % (06)	34.54 % (19)	27.27 % (15)	18.18 % (10)	9.09 % (05)	0.00 % (0)
Finding topics difficult	**BOYS**	2.38 % (01)	2.38 % (01)	21.42 % (09)	14.28 % (06)	59.52 % (24)	2.38 % (01)
	GIRLS	0.00 % (0)	0.00 % (0)	7.27 % (04)	40.00 % (22)	41.81 % (23)	10.90 % (06)

§ (Figures in parentheses indicates absolute numbers)

TABLE 6. Approach of first year MBBS students towards Biochemistry subject represented gender wise

ASPECTS	**Percentage & number distribution**						
	Gender	**Almost Always**	**Always**	**Frequently**	**Half of the times**	**Sometimes**	**Rarely**
Reading 2-3 text books for the same topic	**BOYS**	0.00 % (0)	2.38 % (01)	4.76 % (02)	2.38 % (01)	19.04 % (08)	71.43 % (30)
	GIRLS	0.00 % (0)	1.81 % (01)	5.45 % (03)	3.63% (02)	20.00 % (11)	69.09 % (38)
Studying in a group	**BOYS**	0.00 % (0)	2.38 % (01)	16.66 % (07)	9.52% (04)	26.19 % (11)	45.23 % (19)
	GIRLS	3.63 % (02)	0.00 % (0)	12.72 % (07)	7.27% (04)	36.36 % (20)	40.00 % (22)
Self studying	**BOYS**	26.19 % (11)	57.14 % (24)	11.90 % (05)	2.38% (01)	2.38 % (01)	0.00 % (0)
	GIRLS	23.63 % (13)	36.36 % (20)	30.90 % (17)	7.27% (04)	1.81 % (01)	0.00 % (0)
Using Guides & Easy study materials	**BOYS**	0.00 % (0)	2.38 % (01)	9.52 % (04)	2.38% (01)	30.95 % (13)	54.76 % (23)
	GIRLS	3.63 % (02)	5.45 % (03)	9.09 % (05)	3.63 % (02)	23.63 % (13)	54.54 % (30)
Carrying Record Book for practical's	**BOYS**	38.09 % (16)	57.14 % (24)	4.76 % (02)	0.00% (0)	0.00 % (0)	0.00 % (0)
Memorizing during study	**BOYS**	9.52 % (04)	28.57 % (12)	26.19 % (11)	19.04% (08)	11.90 % (05)	4.76 % (02)
	GIRLS	10.90 % (06)	41.81 % (23)	25.45 % (14)	9.09% (05)	12.72 % (07)	0.00 % (0)
Using Class -notes	**BOYS**	4.76 % (02)	35.71 % (15)	35.71 % (15)	7.14% (03)	7.14 % (03)	9.52 % (04)
	GIRLS	18.18 % (10)	41.81 % (23)	30.90 % (17)	1.81% (01)	3.63 % (02)	1.81 % (01)

Writing of personal study notes	**BOYS**	9.52 % (04)	26.19 % (11)	28.57 % (12)	11.90% (05)	11.90 % (05)	11.90 % (05)
	GIRLS	16.36 % (09)	27.27 % (15)	32.72 % (18)	3.63% (02)	12.72 % (07)	7.27 % (04)
Repeated writing of flow-charts of Biochemical reactions	**BOYS**	7.14 % (03)	26.19 % (11)	30.95 % (13)	16.66 % (07)	11.90 % (05)	7.14 % (03)
	GIRLS	14.54 % (08)	21.81 % (12)	27.27 % (15)	7.27 % (04)	12.72 % (13)	5.45 % (03)
Discussed assessment of theory questions in presence of respective teacher after exam	**BOYS**	2.38 % (01)	7.14 % (03)	23.80 % (10)	2.38 % (01)	23.80 % (10)	40.47 % (17)
	GIRLS	5.45 % (03)	7.27 % (04)	9.09 % (05)	9.09 % (05)	49.09 % (27)	20.00 % (11)
Attended Practice tests in theory	**BOYS**	11.90 % (05)	35.71 % (15)	21.42 % (09)	16.66 % (07)	11.90 % (05)	2.38 % (01)
	GIRLS	18.18 % (10)	23.63 % (13)	20.00 % (11)	16.36 % (09)	14.54 % (08)	7.27 % (04)
Attended Revision Practicals	**BOYS**	21.42 % (09)	57.14 % (24)	9.52 % (04)	4.76 % (02)	2.38 % (01)	4.76 % (02)
	GIRLS	34.54 % (19)	63.63 % (35)	1.81% (01)	0.00 % (0)	0.00 % (0)	0.00 % (0)
Clinical significance of Practicals explained well in advance	**BOYS**	21.42 % (09)	38.09 % (16)	9.52% (04)	4.76 % (02)	21.42 % (09)	4.76 % (02)
	GIRLS	16.36 % (09)	50.90 % (28)	12.72% (07)	3.63 % (02)	12.72 % (07)	3.63 % (02)

‖ (Figures in parentheses indicates absolute numbers)

DISCUSSION

Medical education is considered as a dynamic process and modifications in the teaching–learning methodology should be considered periodically. The perceived effectiveness of biochemistry subject and other basic sciences taught in medical colleges in Western Nepal was studied and a positive attitude was depicted in the study by Ravi Shankar et al ,2007 [8].

Our major concern in the present study amongst the students confines to biochemistry subject taught in the first year MBBS .The duly filled questionnaires were obtained from 55 girls (56.70%) and 42 boys (43.30%).Majority of the first year students that is 47 (85.45%) and 29 (69.04%) boys hailed from urban areas whereas 8 (19.05%) boys and 6 (10.90%) girls belonged to semi- urban area. Both these sections of the first year MBBS medical students that is from urban and semi-urban area had migrated from their hometowns to Loni, the place of present study, in the quest of seeking quality education. Local students comprised of 5 (11.90%) boys and 2 (3.63%) girl students. These data are depicted in Table 1.

Biochemistry subject deals with metabolism of biomolecules in human body which was considered as the most difficult topic by 26 (61.90%) boys and 28 (50.90%) girl students. The difficulty level increased in the order of the topics chemistry 7 boys (16.66%) and 11 (20.00%) girl students, case studies or applied questions were also considered hard by 5 (11.90%) boys and 10 (18.18%) girls, molecular biology or genetics was least difficult by 3 (7.14%) boys and 3 (5.45%) girls. The data is represented in Table 2.

In a study conducted by D'Souza et al 2013 [2] according to the feedback received from the students, they preferred to be taught metabolism after chemistry. In our institution we follow the practice of teaching chemistry followed by the respective metabolism. This simplifies the matter for the students due to the continuity of the contents. But in the present study students regard metabolism as difficult probably due to the different patterns of subject study procedure according to the analysis of feedback received in the present study.

As per Table 2 (50.90%) 28 girl students find metabolism and 10 (18.18%) girl students responded that case studies are difficult. Girl students always gave importance to memorization of study material and frequently to repeated writing of flow – charts according to Table 5.Memorizing without understanding may not help to solve case studies or study metabolism. However, according to a previous study by D'Souza et al 2013[2], metabolism and molecular Biology was considered as difficult topics amongst medical students. The reason cited was the nature of the topics which include complex pathways to be studied. It was suggested that importance needs to be given to these topics while deciding the syllabus which should be modified to facilitate easy learning The learning of biochemistry requires an in-depth cognitive process, to relate the subject to clinical practice. Therefore the syllabus of biochemistry should be framed such that overload of irrelevant facts for first MBBS students be avoided as these might form obstacles in medical student's learning and losing interest and developing apathy [2].The same can be applied to reduce the level of difficulty faced by medical students while studying metabolism in our present study.

Practicals in the subject of biochemistry involved qualitative and quantitative experiments. They are also trained in the identification of "spots" pertaining to vitamin deficiencies, reagent uses, tests, instruments in the subject of biochemistry etc. The syllabus of the subject of biochemistry was distributed in printed form amongst the first year medical students at the start of the course. The examination pattern of theory and practicals was also explained thoroughly to the students at the initial stages of the course. The feedback obtained in the form of duly filled questionnaires disclosed both boys and girl students were well-informed and had sufficient knowledge regarding the various aspects of biochemistry subject and pattern of theory and practical examination so that they can plan their studies accordingly. The data are depicted in Table 3.

Many first year medical students are always striving to gain maximum additional information regarding the topics taught in class by the teachers. According to the survey sometimes they do prior preparation before attending a class in biochemistry. However, all these maneuvers are done with an aim to gain maximum knowledge in the subject. But still sometimes the medical students find several topics difficult in biochemistry. The data is depicted in Table 4.

As per Table 5 majority of the medical students 30 (71.43%) boys and 38 (69.09%) girls rarely had the habit of reading 2-3 text-books for the same topic but overall there was no much difference amongst the genders regarding this habit. Similarly not much difference existed amongst the boys and girls about the habit of studying in a group. But sometimes 11 (26.19%) boys and 20 (36.36%) girls tend to study in a group that means majority of the girls prefer to do group-study.

24 (57.14%) boys and 20 (36.36%) girl students always preferred self-studying. There was no difference in the trend amongst boy and girl students in the usage of guides and easy study materials. Girl students were found more diligent and always [maximum 35 (63.63%)] had the habit of carrying their record books to practicals which outnumbered the 24 (57.14%) boy students who always did so.

23 (41.81%) girl students and 12 (28.57%) boy students always had the habit of memorizing. Similarly the major pattern that always 23(41.81%) girls and 15 (35.71%) boys preferred using class notes. Boy and girl students have common habit of writing personal notes; similarly, repeated writing of flow-charts of biochemical pathways and reactions to memorize them. The trend in attendance to practice tests in theory was found to be satisfactory amongst boys and girls students. 35 (63.63%) girl students and 24 (57.14%) boy students always made it a habit to attend revision practicals which depicts the sincerity of the girl students as compared to the boy students. It was observed that 27 (49.09%) girl students sometimes and 17 boys (40.47%)

rarely discussed assessment of theory questions in presence of respective teacher after exam. This emphasizes that girl students are more conscientious in their approach as compared to boy students in understanding the lacunae's in answering, writing and presentation of answers in an examination so that necessary skills are developed to score more marks in theory examinations.

28 (50.90%) girl students and 16 (38.09%) boy students asserted that always clinical significance of practicals explained well in advance always. It should be mentioned that in biochemistry the experiments in the practicals are explanatory only when the clinical interpretation is simultaneously taught in advance using case studies.

The present attitude and approach of the first year MBBS students can be improved to a greater extent by considering some changes. According to MCI guidelines 2012 for graduate medical education there is suggestion for integration of topics or subject areas. There is scope of integration of the subject of biochemistry with emphasis on thorough learning by the medical students according to authors Vittal and Jaweed (2014) [9].Surapaneni and Tekian (2013) [1] supported that concept mapping and case based learning in combination enhances learning of biochemistry. As per the opinion of Sé et al (2008) [10] close and greater interactions between the teachers and medical students as well as periodic feedbacks from the medical students improves the output of the students by inducing the modification of teaching methodology of teachers.

In previous studies by D'Souza et al 2013 [2] as well as Ghosh and Pandya in 2008 [11] the students preferred integrated teaching for understanding related aspects between biochemistry and other subjects which facilitates easy learning. This aspect of integration of the subject biochemistry may enhance student's learning attitude and approach towards the subject.

According to the study by Varghese et al 2012 [12] e-learning resources had a positive impact on the learning of the subject of biochemistry and on the attitude of the medical students. Hence learning of the subject with the aid and supplement of e-resources as one of the way could be experimented to partly bring about a positive outcome in the attitude and approach of medical students towards biochemistry subject.

CONCLUSION

The attitude and approach of students of first year MBBS towards biochemistry was found to be commendable. The present study also enables the teachers of biochemistry to have an insight into the teaching methodology whereas it helps the first year medical students to improve, rectify and sharpen skills while dealing with the subject of biochemistry.

The present study was an attempt made at one medical college. Similar studies are the need of the hour to provide adequate guidance to the first year medical students regarding the modifications of attitude and approach to gain maximum benefit academically and skillfully while studying biochemistry in the first year of MBBS.

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Nil

CONFLICT OF INTEREST

Nil.

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