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Online Feedback Analysis of Current Teaching Methodology in Anatomy and Physiology Medical Research Practice Among Medical Under Graduates at Sharda University

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ABSTRACT

Introduction: Complex links between anatomy, physiology, and clinical sciences are crucial for both disease diagnosis and managementas it causes structural alterations or anatomical deformities. Future medical professionals must therefore have sufficient anatomical and physiology knowledge that leads to an impactful medical learning depends upon a strong medical teaching system. Therefore, feedback analysis assessment was done of current medical teaching methodology and trends in Anatomy and Physiology medical research practice among medical undergraduates at Sharda University.

Method: A self-structured online questionnaire survey was conducted among 250 medical undergraduates at Sharda University. Questionnaire dealt with teaching methodology in anatomy and physiology medical research practice containingone appropriate answer. Collected data was analysed using SPSS version 23 and p-Value≤0.05 was considered significant.

Result: About (60.3%) of subjects considered 45 minutes as the ideal duration for theory class and asking query from friend at first bench was relevant among (56.2%) study subjects. About (13.8%) study subjects inclined for research at genetic level to understand the etio-pathogenesis of a disease and (23.7%) thought that research is unpopular in country due to poor funding aid by government towards health care.

Conclusion: It was found that for an MBBS undergraduates to receive better and more thorough training and become a qualified physician, modified teaching strategies should be developed.

Keyword: *Feedback, Medical teaching, Methodology, MBBS undergraduates, Medical research*

1. INTRODUCTION

By 2030 there will be one million more MBBS doctors in India. [1]In light of the constantly expanding population and rising life expectancy doctors are vital to our well-being with advancement of medical science and technology [2] that pace the foundation for strong medical teaching system. Education systems need to improve their teaching methods in order to teach medical students more efficiently. [3] Medical education system is revolutionized with newer effective teaching and learning strategies, along with an emphasis on promoting research. However a student-oriented approach is absent from the traditional lecture-based teaching methods used in many Indian medical schools.[4]Traditional teaching-learning techniquesuse classic chalk-and-board method, PowerPoint presentations, overhead projectors, clinical case/bedside teaching which has

advantages and disadvantages of its own. More interactive methods between teachers and students are required for inclining student performance. [5]

Consequently, studies are required to determine the assessment of students' needs in connection to their daily learning activities. As a result, it is essential for teachers to understand that each student has a unique learning style and that they should modify their lessons properly to promote learning. [6]

Human anatomy and physiology serve as fundamental building blocks for medical science. Understanding the human body's structure and organization through anatomy reveals the intricate web of organs, tissues, and systems that function in harmony. Physiology explores functioning of these anatomical structures their interaction and reaction to stimuli. Every advancement in medical technology, from robotic surgery and prosthetics to sophisticated imaging methods, is based on a thorough understanding of human anatomy and physiology. [7]

Medical education combines theoretical instruction with hands-on practice to improve comprehension of the subject. Evaluation tools such as feedback can be used to learn about the benefits and drawbacks of instruction. [8]Assessing students perception of the teaching-learning approach is one of the most crucial ways to improve medical education at the content delivery level.[6]Hence a study was conducted among medical 1st year undergraduates to assess feedback analysis of current medical teaching methodology and trends in Anatomy and Physiology medical research practice at Sharda university.

2. MATERIALS & METHOD

A cross-sectional web based survey was conducted for a duration of 2 months (February–March 2025) at Sharda University.

The study population was selected by purposive sampling and includes all the MBBS undergraduates of first year who gave consent to participate in the study.

A self-structured questionnaire was developed on the topic of interest with demographic details. The questionnaire was consisted of 22 close ended questions with one correct answers. A pilot study was done among 25 MBBS undergraduates of first year to check the feasibility of the main study at Department of Physiology in college premises in the month of January 2025. The study was approved by the Ethics Committee of Sharda University Greater Noida.

The "Google Form" was sent to all undergraduates of first year via WhatsApp group. To make sure that only students filled the questionnaire, the Google Form was encrypted with a question in the beginning asking whether the participant is currently a medical 1st year student or not. If no, the form would end submission. The privacy and confidentiality of the filled questionnaires were maintained. Each student was allowed to complete the questionnaire only once.

The students were followed up 2-3 times for a 100% response rate for 2 month before Anatomy and Physiology lectures. Only 224 of the total 250 first year MBBS undergraduates responded back. The completed questionnaires were subjected to statistical analysis using IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 23 Armonk, NY: IBM Corp. Descriptive statistics were addressed, such as frequency and percentage. A Chi-square test was used to test the significant differences ($P < 0.05$).

3. RESULTS

(Table: 1) In present study, among 250 MBBS 1st year undergraduates, 224 has submitted the responses for the study revealing 89.6% of response rate. It was found that majority 98(43.8%) of study subjects belongs to 20 year of age and a statistically significant (p-Value $\leq$0.05) was found using Pearson chi-square test.

AGE	**GENDER**		**Total**
	FEMALE	**MALE**	
18	21(61.8)	13(38.2)	34(15.1)
19	30(62.5)	18(37.5)	48(21.5)
20	45(45.9)	53(54.1)	98(43.8)
>20	16(37.3)	28(63.6)	44(19.6)
Total	112(50.0)	112(50.0)	224(100.0)
p-VALUE	0.039*		

TABLE 1: DEMOGRAPHIC DETAIL

(Table: 2) According to 69(30.8%) and 135(60.3%) of study subjects 50-100 is the ideal number of students in class for healthy learning discussion and 45 minutes is the ideal duration for theory class respectively. Classes are critical, but attendance should not be forced upon was the most opted option among 128(57.1%) study subjects and teaching structure per week should be 2 hours of Clinical Posting, 3 hours of Theory and 2 hour of Practical as per 93(41.5%) study subjects. Majority 142(63.4%) of study subjects chose use of supplementary aids like animation videos, 3D illustrations, students as methodology to understand subject best and asking query from friend at first bench was relevant among 126(56.2%) study subjects. Current system of theory and practical 59(26.3%) and daily graded system to assess the regularity, punctuality, and learning 59(26.3%) was found as most progressive way to test students with regards to learning process. About 23(10.3%) students found more SGD, less theory and least practical classes as most beneficial teaching methodology in 1st year curriculum and only 38(17.0%) thought that practical skills should be taught in 3rd term while 15(6.7%) thought that oral presentation or poster presentation in speciality conferences is the most effective way to train a student in public speaking.

Only 33(14.7%) thought that a sound theoretical knowledge of the speciality is the most critical skill to develop as a clinician treating a patient. More than half 143(63.8%) thought that research is important in medical school while 104(46.4%) selected 2nd year as ideal time to start research project. Only 31(13.8%) study subjects inclined for research at genetic level to understand the etio-pathogenesis of a disease and 66(29.5%) towards drugs to find a better cure for existing diseases. About half of the study subject had no idea that how to go about research and 53(23.7%) thought that research is not popular in country due to poor funding aid by government towards health care. About 74(33%) of study subjects would like to pursue post-graduation in India because they want to be with their family whereas according to 97(43.3%) of study subjects Indian doctors visit Western countries for super specialty training or fellowships as they are technologically more advanced in health services. About 111(49.6%) of study subjects believed that famous people prefer to receive treatment from doctors or hospitals outside India due to better standard of care and treatment than India. About 72(32.1%) study subjects, most effective way to ensure development and progress in the field of medicine was by better infrastructure with the latest technologies made available in government hospitals.

Q.NO.	QUESTION	OPTION	N	%
1	What do you think should be the ideal number of students in a class to allow healthy learning and discussion process?	Less than 50	65	29.0
		50-100	69	30.8
		100-150	58	25.9
		150-200	31	13.8
		Multiple answer	1	0.4
2	In your opinion, what is the ideal duration of a theory class?	30 Minutes	70	31.2
		45 Minutes	135	60.3
		1 Hour	14	6.2
		1.5 Hour	1	.4
		Multiple answer	4	1.8
3	Which of the following suits you the most?	Classes are extremely important for the learning process.	31	13.8
		Classes are critical, but attendance should not be forced upon.	128	57.1
		Classes may be relevant only on most frequently tested topics in the exams.	27	12.1
		I don't need classes. I attend them only for attendance.	14	6.2
		Multiple answer	24	10.7
4	How should the teaching be structured for students per week?	Clinical Posting 3hrs, Theory 3hrs, Practical 1hrs	79	35.3
		Clinical Posting 1hrs, Theory 3hrs, Practical 4hrs	19	8.5
		Clinical Posting 2hrs, Theory 4hrs, Practical 1hrs	11	4.9
		Clinical Posting 2hrs, Theory 3hrs, Practical 2hrs	93	41.5
		Multiple answer	22	9.8
5	Which methodology helps you understand the subject best?	Small group discussion (SGD)	26	11.6
		PowerPoint presentations.	13	5.8
		Use of supplementary aids like animation videos, 3D illustrations, catalogic students, etc.	142	63.4
		Multiple answer	43	19.2
6	In case of query, which do	Teacher has no time for my doubts.	14	6.2

	you find the most relevant?	Teacher might make fun of me, regarding lack of my knowledge.	28	12.5
		It's easier to ask my friend sitting in the first bench.	126	56.2
		Multiple answer	56	25.0
7	Which is the most progressive way to test students with regards to learning process?	The current system of theory and practical.	59	26.3
		Only multiple choice questions with Viva.	49	21.9
		It should be a daily graded system to assess the regularity, punctuality, and learning process of students.	59	26.3
		We don't need exams.	25	11.2
		Multiple answer	32	14.2
8	In your 1st year curriculum which teaching methodology is most beneficial?	Small group discussion (SGD)	38	17.0
		Theory	28	12.5
		Practical classes	122	54.5
		More SGD less theory and least practical classes	23	10.3
		More SGD and no theory and practical classes	12	5.3
9	When do you think practical skills should be taught?	1st term	137	61.2
		3rd term	38	17.0
		Nothing should be done before internship.	13	5.8
		Multiply Answer	36	16.0
10	What do you think is the most effective way to train a student in public speaking?	Seminar topics allotted to students	58	25.9
		Clinical presentation of a patient about his medical problem to the consultant doctor	80	35.7
		Anchoring in college sets	12	5.4
		Oral presentation or poster presentation in speciality conferences	15	6.7
		Multiply Answer	59	26.3
11	What do you think is the most critical skill to develop as a clinician treating a patient?	A sound theoretical knowledge of the speciality he or she is in	33	14.7
		The art of communicating with patient	92	41.1
		Empathizing the patient	15	6.7
		Running a thorough laboratory workup for patient	8	3.6
		Multiple answer	76	33.9

12	Do you think research is important in medical school?	Yes	143	63.8
		No	7	3.1
		I am not sure because I have not been in one	53	23.6
		Research is not for doctor	5	2.4
		Multiple answer	16	7.1
13	When do you think is an ideal time to start a research project?	1st year	57	25.4
		2nd year	104	46.4
		3rd year	34	15.2
		Final year	12	5.4
		Internship	2	7.6
14	Which subject you are most inclined to do a research on?	Research at genetic level to understand the etiopathogenesis of a disease	31	13.8
		Research in drugs to find a better cure for existing diseases	66	29.5
		Research in basic science and paraclinical sciences to understand variation of normal anatomy and physiology in various population groups	34	15.2
		Research in clinical sciences regarding atypical disease pattern and outcomes of surgery	40	17.9
		Multiple answers	53	23.6
15	Why do you think you haven't started working on a research project yet?	I have no idea how to go about it	105	46.9
		Teachers don't encourage research	15	6.7
		Limited available resources and difficulty accessing	34	15.2
		Not interested	32	14.3
		Multiple answers	38	16.9
16	16. Why do you think research is not popular in our country?	Hospitals are severely unstaffed and doctors are clinically overworked	51	22.8
		There is a very poor funding aid by government towards health care	53	23.7
		Lack of financial incentives to the doctors	39	17.4
		It is easier to follow Western data	10	4.5
		Multiple answer	71	31.6
17	Which of the following do you think is apt for you?	I would like to pursue post-graduation in India because of a patient load	42	18.8

		I would like to pursue post-graduation in India because I want to be with my family	74	33.0
		I would like to pursue post-graduation in Western countries because of advanced and better quality of patient care	50	22.3
		There is no difference between India and Western countries in terms of healthcare	4	1.8
		Multiple answer	57	25
18	Why do Indian doctors visit Western countries for super specialty training or fellowships?	It looks cool on visiting cards	17	7.6
		They are technologically more advanced in health services	97	43.3
		They have better clinical experience than Indian doctors	14	6.2
		They practice evidence-based medicine and authentic clinical research	96	42.8
		Multiple answer	17	7.6
19	Why do you think famous people like cricketers, film actors, politicians prefer to receive treatment from doctors or hospitals outside India?	They believe their standard of care and treatment is better as compared to Indian hospitals	111	49.6
		They have more money	24	10.7
		They have better skilled doctors with updated knowledge	25	11.2
		They are free from media interference	8	3.6
		Multiple answers	56	25.0
20	What do you think is the most effective way to ensure development and progress in the field of medicine?	Better funding from the government towards health schemes for the patient	31	13.8
		Better infrastructure with the latest technologies made available in government hospitals	72	32.1
		Evidence-based medicine from results of research done in our Indian population instead of following western data	32	14.3
		We are on par with the world with respect to healthcare	4	1.8
		Multiple answers	83	37.9

TABLE 2: QUESTIONNAIRE

4. DISCUSSION

In present study 69(30.8%) students preferred class strength to be 50-100, less than the results reported by Nekkanti et al.[9] It has been found that small group instruction improved students' subject-matter knowledge, attitude, and competency.[10]However both studies reported 45 minutes to be an ideal duration for theory class whereas Mustafa T et al[11] reported that almost all (92%) of study subjects reported that they could not concentrate in class beyond 30 minutes as it was

found that the human attention span is limited which some researchers have laudably stated that it lasts for a maximum of 20 minutes in every hour.Hence lectures should be planned according to the limited human attention span with high quality content to enhance effectiveness of topic.[12]Majority of students felt that attendance should not be forced upon, parallel to the results of Nekkanti et al.[9] However active learning strategies and improved cognitive integration throughout the lectures can encouraged students to attend class more frequently effortlessly.[13]In present study usage of supplementary aids were considered as best way to understand subject whereas in results reported by Zubair AA[14]group discussions helped to arouse interest in the subject and in study by Vijayan P. [15] case based discussions and group discussions were the most useful teaching aids. Therefore medical education should be adaptable enough to successfully and suitably integrate multidisciplinary teaching methods starting from the preclinical years.In present study their current system of theory and practical 59(26.3%) and daily graded system to assess the regularity, punctuality, and learning 59(26.3%) was found as most progressive way to test students with regards to learning process in accordance with the Zubair AA[14] and oral presentation or poster presentation in speciality conferences was considered as the most effective way to train a student in public speaking similar to the Nekkanti et al.[9]Oral presentations are widely used in tertiary settings worldwide and help students to learn, as well as frequently used as a form of evaluation in all subject areas. Presentation abilities, one of the components of communication skills essential for any student at the tertiary level and vital to manage patient.Almost half of the study subjects reported art of communication with patient as most critical skill to develop as a clinician treating a patient, however future physicians must be adequately trained as well as should be well versed in sound theoretical knowledge of the speciality and empathizing the patient for best illness diagnosis and treatment management.[17]

More than half of study subjects thought that research is important in medical school and about half of them opted 2nd year as ideal time to start research project, similar results reported by Zubair AA. [14] This could be due to the burden of study felt by students in initial years of under graduation also in present study nearly half of the study subjects had no idea how to start about research project. About (29.5%) of study subjects shown interest towards drugs to find a better cure for existing diseases in line with results reported by Nekkanti et al.[9] which shows their zeal to find treatment and unawareness about the need to find cause and spread of disease crucial for case management. Illness results in structural changes or anatomical deformities that affect how well organs and systems work. Therefore, knowledge for intricate relationships between anatomy, physiology, pathology, radiology, and clinical sciences are essential for both illness diagnosis and treatment analysis. [17] Poor funding aid by government towards health care and research, advanced technology and health services in Western countries was found to be another factor by study subjects in present and similar study [9] led to pursue super specialty training or fellowships by doctors there. Government should raise the funds for medical research as well as awareness to foster the medical growth and encourage upcoming medical professionals.Limitationof the study was that the survey conducted among single batch of MBBS undergraduates at a single Institution, hence it has small sample size therefore, for generalizing the result of this survey a study with larger sample is suggested that might include undergraduates from all year with multicentre study setting.For progression and advancement of medical profession, medical educators are essential and basic subjects such as anatomy and physiology plays a crucial role to develop deep learning for body system. This survey helps to understand the efficiency of teaching methodologyby feedback from aspiring doctors as well as their learning from it and potential drawbacks that can be addressed. [18]

5. CONCLUSION

This study revealed feedback of MBBS first year undergraduates promoting modificationin current medical education system with an emphasis on the improved teaching and learning strategies with additional resources, more effective evaluation strategies and basic subjects detailed understanding with early research promotion & government aid. For an MBBS student to receive better and more thorough training and become a qualified physician, these needs would need to be met

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