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Original Research Article

Students' attitude towards different modalities of teaching in the medical curriculum of the faculty of physiology, SKIMS Medical College, Bemina

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ABSTRACT

Background: The way that students learn and the caliber of their learning results are both influenced by their judgments about their learning modes. The clinical portion of undergraduate medical courses is conducted in a setting intended more for clinical service than for instruction. When these two activities fight for resources, tension results. A projected rise in the number of medical students prompted us to evaluate the learning environment in order to make future plans. Objective was to evaluate students' attitude towards different modalities of teaching in the medical curriculum of the faculty of physiology, SKIMS medical college, Bemina.
Methods: 200 SKIMS medical college students between the ages of 19 and 25 participated in a questionnaire-based study starting in October 2022. The phrasing of the question is repeated below. Each teaching method- lectures, handouts, textbooks, media sites (video-recorded lectures), simulation, PBL (problem-based learning), TBL (team-based learning), and ICM (introduction to clinical medicine, physical examination) practicals- was the subject of five questions. Answers were on a 5-step Likert scale.
Results: It was a descriptive type of research in nature. The data has been collected with the help of a structured questionnaire based on the Likert scale.
Conclusions: The study's overall conclusions demonstrated that there had been significant changes in attitudes regarding professional development, team experiences, and peer evaluation.

Keywords: Handouts, Lectures, Problem based learning, Team based learning, Textbooks, Video recorded lectures

INTRODUCTION

Over the last two decades a paradigm shift has occurred in the way medicine is taught and learnt. Traditionally, medical schools have attempted to include an enormous amount of factual information into their preclinical curricula. This has resulted in a perception that students are overwhelmed with information that is scarcely related to medical practice and in this sense irrelevant, and that they respond to this challenge by adopting a strategy of superficial fact learning rather than deep understanding. The solution to this problem was thought to be training medical students as self-learners.[1]

Three trends are discernible in the developments of the last three to four decades. One consists of efforts to introduce more clinical content in the first two years of medical school while minimizing the teaching of those basic science elements that have no obvious clinical relevance. The second trend is the development of active learning modalities in which the emphasis is not on fact knowledge and routine clinical skills, but on the development of reasoning and communication skills. This emphasis produced small-group based learning featuring students' active participation and self-learning, including problem-based learning (PBL) and later team-based learning (TBL). The third development is driven by

innovations in simulation technology and web-based methods. It brought forth video-recorded lectures that students watch at home, and simulation using patient manikins.[2]

In order to be used successfully, these new methods need to be fully accepted by faculty and students. However, surprisingly few studies have investigated the attitudes and opinions of faculty and students about these rapidly diversifying teaching modalities. For example, Alimoglu et al reported that in the first and second years of medical school in Turkey the students gave lowest ratings for lectures.[3] They were more satisfied with PBL, and most of all with practicals. Henning et al reported that students expressed needs for: more clinical exposure early in the curriculum; fewer lectures; greater consistency of assessment; and more constructive relationships.[4] Jelsing et al studied attitudes of first year students at Mayo Medical School.[5] Student ratings for satisfaction and perceived learning were low for clinical integration sessions, mentor interaction and shadowing relative to didactic sessions, TBL, and independent study.

Other studies have been done on attitudes to individual teaching modalities such as TBL, but without comparing them with attitudes to other modalities used at the same school.[6,7]

The current study assessed the attitudes of students about 6 different teaching/learning modalities in the first 2 years of medical school. The modalities include lectures, PBL (problem-based learning), a form of TBL (team-based learning), media site (video recorded lectures on the Internet), textbooks/handouts, ICM (introduction to clinical medicine)/ practicals. The questionnaire used in this study was based on the Minnesota Satisfaction Questionnaire.[8]

METHODS

The present study was a descriptive in nature and was undertaken in the postgraduate department of physiology, SKIMS Medical College and Hospital, with effect from November 2021 to October 2022, on 250 students aged 19-25 years. The SKIMS Medical College is situated in the Indian state of Jammu and Kashmir, just outside of Srinagar. Nearly all of the students were Indian citizens. The college runs on a system of professional exams. A total of 250 students were enrolled in the first two trimesters at the time of the study (2022-2023). At the conclusion of their basic science degree, students volunteer for the NEET PG exam, and if selected, they have the opportunity to work as postgraduates in a variety of medical specialties.

Source of data

All the students studying in 1st and 2nd year participated in the study.

Inclusion criteria

Students of 1st and 2nd trimester. Age between 19-25 years. Both males and females were included.

Exclusion criteria

No students except studying in 1st and 2nd trimester were allowed to participate in the study.

Statistical analysis

The data was analyzed using computer software Microsoft Excel and SPSS version 20.0 for windows. Data reported was as mean±standard deviation and proportions deemed as appropriate for quantitative and qualitative variable respectively. The statistical difference in mean value was tested using unpaired 't' test. ANOVA of variance was also performed to evaluate statistical significance in more than two groups. A p value of <0.05 was considered statistically significant. All p values reported were two-tailed.

RESULTS

It was a descriptive type of research in nature. The data has been collected with the help of a structured questionnaire based on the Likert scale. The sample size for the study is 200. The below given table summarizes the data as per the gender of the respondent and gives the total number of male/female respondents, the most frequent answer and the number of respondents who answer the most frequent option for each question of the schedule. It was observed that 94 respondents were males and 106 respondents were females.

Table 1: Descriptive statistics: Q1-Q30.

Variable	Gender	N	N*	Mean	Mode	N for mode
Q1	1	94	0	2.4362	2	38
	2	106	0	2.2736	3	38
Q2	1	94	0	2.7660	3	39
	2	106	0	2.7642	3	70
Q3	1	94	0	2.521	3	35
	2	106	0	2.5377	2	47
Q4	1	94	0	3.032	4	48

Continued.

Variable	Gender	N	N*	Mean	Mode	N for mode
	2	106	0	3.019	4	53
Q5	1	94	0	2.9043	3	45
	2	106	0	2.9623	3	60
Q6	1	94	0	1.8085	1	41
	2	106	0	1.6604	1	51
Q7	1	94	0	2.5426	2	41
	2	106	0	2.7264	3	58
Q8	1	94	0	2.2021	2	40
	2	106	0	2.2547	2	54
Q9	1	94	0	2.894	4	44
	2	106	0	2.991	4	50
Q10	1	94	0	2.0957	2	40
	2	106	0	2.1415	2	63
Q11	1	94	0	2.0745	2	39
	2	106	0	2.2264	2	44
Q12	1	94	0	2.0426	2	63
	2	106	0	2.1981	2	55
Q13	1	94	0	2.2340	2	52
	2	106	0	2.3396	2	47
Q14	1	94	0	2.830	4	41
	2	106	0	3.113	4	55
Q15	1	94	0	2.0106	2	46
	2	106	0	2.2170	2	47
Q16	1	94	0	1.9043	1	37
	2	106	0	2.151	1	36
Q17	1	94	0	2.840	2	30
	2	106	0	3.358	4	56
Q18	1	94	0	1.8617	2	41
	2	106	0	2.0849	2	52
Q19	1	94	0	2.564	4	41
	2	106	0	3.132	4	67
Q20	1	94	0	1.9894	2	43
	2	106	0	2.2264	2	49
Q21	1	94	0	2.181	2	35
	2	106	0	2.3019	2	48
Q22	1	94	0	2.0957	2	44
	2	106	0	2.2736	2	47
Q23	1	94	0	2.0426	2	49
	2	106	0	2.3585	2	41
Q24	1	94	0	2.957	4	48
	2	106	0	3.264	4	63
Q25	1	94	0	2.4255	2	38
	2	106	0	2.6792	3	46
Q26	1	94	0	1.7447	1	45
	2	106	0	1.5377	1	63
Q27	1	94	0	2.1277	2	55
	2	106	0	2.1887	2	53
Q28	1	94	0	2.0213	2	51
	2	106	0	1.8585	2	54
Q29	1	94	0	2.702	4	44
	2	106	0	2.755	4	55
Q30	1	94	0	2.351	2	44
	2	106	0	2.0849	2	57

DISCUSSION

Factor analysis was used to assess the structure of the data by evaluating the correlations between variables. Factor analysis summarizes data into a few dimensions by condensing a large number of variables into a smaller set of latent factors not directly measured or observed, but are easier to interpret. To determine the number of factors the scree plot orders the eigenvalues from largest to smallest. The ideal pattern is a steep curve, followed by a bend, and then a straight line. These results show the un-rotated factor loadings for all the factors using the principal components method of extraction. The first five factors have variances (eigenvalues) that are greater than 1. The eigenvalues change less markedly when more than 6 factors are used. Therefore, 4-5 factors appear to explain most of the variability in the data. The percentage of variability explained by factor 1 was 0.089 or 8.9%. The percentage of variability explained by factor 5 was 0.051 or 5.1%. The scree plot shows that the first five factors account for most of the total variability in data. The remaining factors account for a very small proportion of the variability and are likely unimportant. In these results, a varimax rotation was performed on the data. Using the rotated factor loadings, interpretation of the factors is as follows: Q21 to Q25 have higher loadings on the factor 1. Q1 to Q3 have higher loading on the factor 2. Q11 to Q13 have a higher loading on factor 3. The factors jointly explain 33% of the total variation in the dataset.

Factor analysis

Maximum likelihood factor analysis of the correlation matrix

Table 2 below shows rotated factor loadings and communalities.

Table 2: Rotated factor loadings and communalities.

Varimax rotation						
Variables	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**	**Communality**
Q1	0.056	0.374	-0.043	0.211	-0.397	0.347
Q2	0.106	0.249	0.020	-0.094	-0.272	0.156
Q3	-0.027	0.281	-0.079	-0.059	0.014	0.089
Q4	-0.030	0.004	-0.008	-0.119	-0.263	0.084
Q5	0.076	0.349	-0.153	-0.164	-0.312	0.275
Q6	0.025	0.218	-0.075	-0.047	0.529	0.335
Q7	0.163	0.070	-0.252	-0.143	0.250	0.178
Q8	0.053	0.026	-0.081	-0.262	0.502	0.331
Q9	-0.065	0.043	-0.083	-0.205	0.110	0.067
Q10	0.076	0.244	-0.072	-0.205	0.463	0.327
Q11	0.047	-0.088	0.721	0.051	-0.000	0.532
Q12	0.223	-0.015	0.392	0.002	-0.184	0.237
Q13	0.084	0.013	0.665	0.126	0.010	0.465
Q14	-0.008	0.039	0.119	-0.129	-0.155	0.056
Q15	0.099	0.118	0.684	-0.025	-0.043	0.495
Q16	0.047	-0.038	-0.098	-0.528	-0.023	0.293
Q17	0.311	0.072	0.009	-0.385	-0.335	0.363
Q18	0.092	0.145	-0.000	-0.773	0.126	0.644
Q19	0.048	0.130	-0.117	-0.398	-0.052	0.194
Q20	0.063	0.158	0.170	-0.544	0.027	0.354
Q21	0.719	-0.012	0.207	0.010	0.053	0.562
Q22	0.799	0.205	0.068	0.046	-0.054	0.691
Q23	0.687	0.054	0.093	-0.138	-0.010	0.504
Q24	0.339	0.137	-0.033	0.020	0.068	0.140
Q25	0.723	0.170	0.073	-0.177	0.038	0.590
Q26	0.094	0.394	-0.032	-0.074	0.087	0.178
Q27	0.289	0.427	0.137	-0.037	-0.094	0.295
Q28	0.137	0.706	0.141	-0.114	0.242	0.608
Q29	0.031	0.405	0.089	-0.055	-0.039	0.178
Q30	0.240	0.507	-0.050	-0.061	0.131	0.338
Variance	2.6798	1.9597	1.8818	1.8680	1.5157	9.9050
% Var	0.089	0.065	0.063	0.062	0.051	0.330

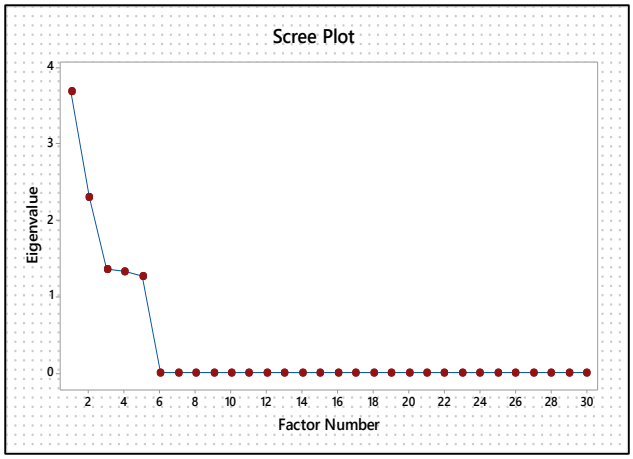

Figure 1: Scree plot.

The correlation coefficients are given with the corresponding p values given below them. Correlation coefficients with a p value less than 0.05 were considered significant at 5% LOS. Close to 1 correlation coefficient indicates a positive correlation and close to -1 correlation coefficient indicates a negative correlation.

Table 3: Spearman Rho: Q1, Q6, Q11, Q16, Q21, Q26 correlations.

	Q1	Q6	Q11	Q16	Q21
Q6	-0.058				
	0.413				
Q11	-0.070	-0.085			
	0.324	0.230			
Q16	-0.103	0.021	-0.019		
	0.148	0.764	0.785		
Q21	0.020	0.052	0.232	0.105	
	0.778	0.464	0.001	0.140	
Q26	0.092	0.076	-0.032	0.151	0.152
	0.194	0.286	0.649	0.033	0.032

Cell contents: Spearman rho, p value

Table 4: Spearman Rho: Q2, Q7, Q12, Q17, Q22, Q27 correlations.

	Q2	Q7	Q12	Q17	Q22
Q7	0.022				
	0.756				
Q12	0.148	0.069			
	0.037	0.333			
Q17	0.317	0.166	0.174		
	0.000	0.019	0.014		
Q22	0.157	0.154	0.268	0.283	
	0.027	0.029	0.000	0.000	
Q27	0.175	0.186	0.229	0.354	0.388
	0.013	0.008	0.001	0.000	0.000

Cell contents: Spearman rho, p value

Table 5: Spearman Rho: Q3, Q8, Q13, Q18, Q23, Q28 correlations.

	Q3	Q8	Q13	Q18	Q23
Q8	0.187				
	0.008				
Q13	-0.050	-0.018			
	0.482	0.799			
Q18	0.125	0.273	-0.105		
	0.078	0.000	0.141		
Q23	0.059	0.112	0.163	0.156	
	0.407	0.114	0.021	0.027	
Q28	0.146	0.085	0.034	0.297	0.171
	0.039	0.233	0.633	0.000	0.015

Cell contents: Spearman rho, p value

Table 6: Spearman Rho: Q4, Q9, Q14, Q19, Q24, Q29 correlations.

	Q4	Q9	Q14	Q19	Q24
Q9	0.049				
	0.494				
Q14	0.169	0.071			
	0.017	0.318			
Q19	0.126	0.109	0.201		
	0.074	0.124	0.004		
Q24	0.022	0.130	0.042	0.121	
	0.757	0.066	0.554	0.089	
Q29	0.112	0.102	0.091	0.232	0.114
	0.115	0.151	0.201	0.001	0.107

Cell contents: Spearman rho, p value

Table 7: Spearman Rho: Q5, Q10, Q15, Q20, Q25, Q30 correlations.

	Q5	Q10	Q15	Q20	Q25
Q10	0.064				
	0.365				
Q15	-0.046	0.009			
	0.519	0.902			
Q20	0.089	0.164	0.149		
	0.209	0.020	0.035		
Q25	0.139	0.102	0.199	0.208	
	0.050	0.151	0.005	0.003	
Q30	0.126	0.124	-0.024	0.231	0.287
	0.076	0.079	0.737	0.001	0.000

Cell contents: Spearman rho, p value

Of the total 200 respondents included in the study 94 were males and rest were females. After analysing the data with varying numbers of factors, it becomes evident that using more than six factors does not significantly alter the eigenvalues. Rather, the greatest amount of variability is explained by only four to five factors. Interestingly, the first factor explains 8.9% of the variability while the fifth factor only explains 5.1%.

This information is further supported by the scree plot, which shows a clear drop-off after the first several factors. Based on the factor loadings, Q21 to Q25 have higher loadings on factor 1, which implies that these questions have a strong association with factor 1. On the other hand, Q1 to Q3 have higher loading on factor 2, indicating a significant relationship with factor 2. Moreover, Q11 to Q13 have higher loading on factor 3, signaling a robust correlation with factor 3. The interpretation process involves examining the loadings of each variable on each factor and determining what the variables have in common. In our particular study, we found that some questions showed a positive correlation with each other, indicating a similar underlying construct. However, we also found that some questions showed a negative correlation with others, indicating important differences in the constructs being measured. By carefully examining the factor loadings and correlations, we were able to gain a deeper understanding of the underlying constructs and how they relate to each other. Upon correlation analysis of the responses, it was revealed that there were certain questions that were positively associated with each other, while some showed a negative correlation. These findings highlight the interrelated nature of the variables being studied, which resonates with the aim of the research to explore the complex relationships between these factors.

CONCLUSION

The study's overall conclusions demonstrated that there had been significant changes in attitudes regarding professional development, team experiences, and peer evaluation. In the first year of medical school, students expressed more favourable attitudes towards professional development and satisfaction with peer assessment. In the second year of medical school, there was a noticeable improvement in attitudes regarding satisfaction with the team experience. For the topics of team impact on learning quality and team impact on clinical reasoning ability, there were no appreciable changes in attitudes between the first and second years of medical school.

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ANNEXURE

Student Questionnaire

Age: Gender:

1. How much do you personally like to learn by lectures?
   I. Always
   II. Very Often
   III. Sometimes
   IV. Rarely
   V. Never
2. Do you like lectures? Why?
   i. Very easy
   ii. Easy
   iii. Neutral
   iv. Difficult
   v. Very difficult
3. How effective are lectures for you to acquire clinical knowledge?
   I. Extremely Helpful
   II. Very Helpful
   III. Somewhat Helpful
   IV. Not so helpful
   V. Not all helpful
4. According to you, lectures are the most productive way to develop clinical judgement.
   I. Strongly agree
   II. Disagree
   III. Neither agree nor disagree
   IV. Agree
   V. Strongly disagree
5. How effective are lectures for you to prepare for NEET PG?
   I. Extremely effective
   II. Very effective
   III. Somewhat effective
   IV. Not so effective
   V. Not effective at all
6. How much do you personally like to learn by handouts, textbooks?
   I. Always
   II. Very Often
   III. Sometimes
   IV. Rarely
   V. Never
7. Why do you like or dislike handouts and textbooks?
   I. Very easy
   II. Easy
   III. Neutral
   IV. Difficult
   V. Very difficult
8. How effective are handouts, textbooks for you to acquire clinical knowledge?
   I. Extremely Helpful
   II. Very Helpful
   III. Somewhat Helpful
   IV. Not so helpful
   V. Not all helpful
9. Do you think handouts and textbooks are the most useful for developing clinical judgement?
   I. Strongly agree
   II. Disagree
   III. Neither agree nor disagree
   IV. Agree
   V. Strongly disagree
10. How effective are handouts, textbooks for you to prepare for NEET PG?
    I. Extremely effective
    II. Very effective
    III. Somewhat effective
    IV. Not so effective
    V. Not effective at all
11. How much do you personally like to learn by media sites (video-recorded lectures)?
    I. Always
    II. Very Often

III. Sometimes
IV. Rarely
V. Never
12. Why do you like or dislike watching lectures on video-sharing websites?
i. Very easy
ii. Easy
iii. Neutral
iv. Difficult
v. Very difficult
13. How effective are media sites (video-recorded lectures) for you to acquire clinical knowledge?
I. Extremely Helpful
II. Very Helpful
III. Somewhat Helpful
IV. Not so helpful
V. Not all helpful
14. In your opinion media sites (video-recorded lectures) are most effective to acquire clinical judgement.
I. Strongly agree
II. Disagree
III. Neither agree nor disagree
IV. Agree
V. Strongly disagree
15. How effective are media sites (video-recorded lectures) for you to prepare for NEET PG?
I. Extremely effective
II. Very effective
III. Somewhat effective
IV. Not so effective
V. Not effective at all
16. How much do you personally like to learn by simulation, PBL (problem-based learning)?
I. Always
II. Very Often
III. Sometimes
IV. Rarely
V. Never
17. Why do you like or dislike simulation, PBL (problem-based learning)?
i. Very easy
ii. Easy
iii. Neutral
iv. Difficult
v. Very difficult
18. How effective are for you simulation, PBL (problem-based learning) to acquire clinical knowledge?
I. Extremely Helpful
II. Very Helpful
III. Somewhat Helpful
IV. Not so helpful
V. Not all helpful
19. In your opinion simulation, PBL (problem-based learning) are most effective to acquire clinical judgement.
I. Strongly agree
II. Disagree
III. Neither agree nor disagree
IV. Agree
V. Strongly disagree
20. How effective are simulation, PBL (problem-based learning) for you to prepare for NEET PG?
I. Extremely effective
II. Very effective
III. Somewhat effective
IV. Not so effective
V. Not effective at all
21. How much do you personally like to learn by TBL (team-based learning)?
I. Always
II. Very Often
III. Sometimes
IV. Rarely
V. Never
22. Why do prefer or not prefer TBL (team-based learning)?
i. Very easy
ii. Easy
iii. Neutral
iv. Difficult
v. Very difficult
23. How effective is for you TBL (team-based learning) to acquire clinical knowledge?
I. Extremely Helpful

II. Very Helpful
III. Somewhat Helpful
IV. Not so helpful
V. Not all helpful

24. In your opinion TBL (team-based learning) is most effective to acquire clinical judgement.
I. Strongly agree
II. Disagree
III. Neither agree nor disagree
IV. Agree
V. Strongly disagree

25. How effective is TBL (team-based learning) for you to prepare for NEET PG?
I. Extremely effective
II. Very effective
III. Somewhat effective
IV. Not so effective
V. Not effective at all

26. How much do you personally like to learn by practicals i.e ICM (introduction to clinical medicine, physical examination)?
I. Always
II. Very Often
III. Sometimes
IV. Rarely
V. Never

27. Why do prefer or not prefer learning by practicals i.e ICM (introduction to clinical medicine, physical examination)?
i. Very easy
ii. Easy
iii. Neutral
iv. Difficult
v. Very difficult

28. How effective is for you to acquire clinical knowledge by practicals i.e ICM (introduction to clinical medicine, physical examination)?
I. Extremely Helpful
II. Very Helpful
III. Somewhat Helpful
IV. Not so helpful
V. Not all helpful

29. In your opinion practicals i.e ICM (introduction to clinical medicine, physical examination) are most effective to acquire clinical judgement.
I. Strongly agree
II. Disagree
III. Neither agree nor disagree
IV. Agree
V. Strongly disagree

30. How effective are practicals i.e ICM (introduction to clinical medicine, physical examination) for you to prepare for NEET PG?
I. Extremely effective
II. Very effective
III. Somewhat effective
IV. Not so effective
V. Not effective at all