Original Article

Factors Disturbing Undergraduate Students' Interaction During Lecture: A Gender-Based Study

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Abstract

Background: Effective student interaction during lectures is a key component of active learning, promoting critical thinking, deeper understanding, and long-term retention of knowledge.

Objectives: To determine the different factors affecting students' interaction during lectures.

Methods: A comparative cross-sectional study was carried out in a private medical college of Faisalabad. Sample size was 300 and those who gave consent were included. Lecture disturbance factors divided into four categories i.e. colleague, faculty, individual and environment related factors. A validated questionnaire was used and distributed via google forms. SPSS 25 was employed for assessing and analysing data. Means of disturbance factors were calculated. The Mann-Whitney U test was used to compare the median scores of disturbance factors between male and female students, while the chi-square test was applied to examine associations between gender and specific categorical disturbance items. P value < 0.05 was taken as significant.

Results: Most common factors identified were faculty and environmental. Distribution of all 4 factors was same in both gender categories. For faculty, long lecture without break (Mean $\pm$ S.D. = 3.57 $\pm$ 0.59); for environmental, air – conditioning problem (Mean $\pm$ S.D. = 3.12 $\pm$ 1.04); for individual, fear of making mistake while asking question (Mean $\pm$ S.D. = 2.98 $\pm$ 0.99) and for colleague, gossiping during lecture (Mean $\pm$ S.D. = 2.96 $\pm$ 1.06) were the most common identified factors causing lecture disturbance. Significant associations were found between faculty and MBBS classes (p = 0.03) and between environmental and permanent residence (p = 0.001).

Conclusion: Males were more disturbed by colleague and faculty-related factors while females were disturbed more by individual and class environment factors. All stakeholders including administration, faculty, and students must overcome these factors to reduce disturbance during lectures leading to smooth learning for students.

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Introduction

A multitude of factors impact student learning and engagement in the dynamic and multifaceted tertiary educational landscape.[1] A key factor in predicting success is the degree of classroom engagement and involvement from the students.[2] One

of the most important aspects of undergraduate education's learning process is peer interaction. Peers can either create disruptions that make it more difficult for students to participate in class discussions or they can enhance a positive learning atmosphere.[3] Positive peer relationships often foster a collaborative learning environment, enhance motivation, and promote the exchange of knowledge.[4] The way these violations are treated and addressed also depends on gender roles. For example, female students may be less likely to engage in discussions and ask questions because they experience more fear and discomfort from each other's undermining colleagues.[5]

The classroom environment and the relationship between students and the surrounding conditions depend heavily on the role of the teacher. Discipline, clear communication, and good teaching strategies are necessary to minimize disruptions in the classroom. A teacher who helps students feel more at ease may establish a welcoming classroom that encourages engagement and lowers distractions.[6] There are other factors associated with education that can cause disturbance e.g. poor behavioral control and weak learning strategies can cause more violations. In addition, class relations may be influenced by the gender dynamics between teachers and students. If male-dominated classrooms, especially in areas where men are also dominant, female students may feel less confident, which can reduce their participation and make them more vulnerable to violations.[7]

The interaction between the students during the lectures also largely depends on personal factors such as the unique and personal circumstances of each student. A student may find it challenging to participate completely in the learning process if they are dealing with anxiety, low self-esteem, or mental exhaustion, among other problems.[8] Gender disparity is evident in the ways that these specific qualities affect student interactions. Higher levels of stress and anxiety are often reported in female students, which may reduce their participation in classes and increase their propensity to distractions.[9]

Students' interaction is highly dependent on their physical and psychological environment.[10] Class design, lighting, temperature, and noise levels can affect students' ability to concentrate and lecture. In a packed or badly laid out classroom, children could find it challenging to participate in class and might even start acting out.[11] Student interactions are also influenced by the institutional culture and the general vibe of the institution. Some students may be more sensitive to environmental stressors and thus more likely to experience disruptions in interaction due to suboptimal classroom conditions, therefore, understanding the gender-based differences in how these factors affect student interaction is essential for developing targeted interventions.[12]

Undergraduate student interaction during lectures is impacted by a complex interaction between personal, environmental, teacher, and classmate factors. It is essential to comprehend these elements and how gender affects them to develop educational strategies and interventions that work. This study aims to provide a comprehensive analysis of these factors and offer insights into how universities can better support their students in achieving their academic potential.

Methods

After taking ethical approval from institutional ethical committee with Ref. No. IEC/235-23, a comparative cross-sectional study was conducted among medical students from July 2023 to March 2024. Quota sampling was done and a sample size of 300 was calculated using OpenEpi sample size calculator, based on an expected prevalence of 50%, a 95% confidence level, and 5% margin of error, as supported by previous similar studies. This approach ensured a sufficiently powered sample for statistical comparisons. Informed consent was taken before study from sample population. All those who were medical undergraduate students and gave consent were included. 60 students from each MBBS class (30 males, 30 females) were taken. Those who filled the questionnaire first were included and rest were excluded. The study made use of a Google-based online questionnaire that was created and administered online A validated questionnaire was used which had 5 different components i.e. participants socio-demographics; colleague (9 questions) and faculty (16 questions) and individual (11 questions) and environmental factors (6 questions) related to disturbance during lecture.'13 The answers were recorded as likert scale with strongly agree = 4 to strongly disagree = 0. The information was treated with confidentially and data was coded and analysed with SPSS version 25. Means were calculated to see the prevalence of most

commonly associated factors related to disturbance in lecture. Normality of data was assessed using the Shapiro-Wilk test. For normally distributed variables, the independent sample t-test was used to compare means between male and female students. For non-normally distributed variables, the Mann-Whitney U test was applied. Chi-square test was used for associations between gender and categorical variables. A p-value < 0.05 was considered statistically significant.

Results

Medical students included in the study were 300. Equal percentage of participants were included from each MBBS class i.e. 60 including equal representation of males and females i.e. 30 students of each gender. Majority were of above 21-year age group (172, 57.3%) while below 21 years of age were 128 (42.3%) in number. Most of the students were day scholars i.e. 224 (74.7%) while hostelite students were 76 (25.3%) in number. Majority of the students were living in urban areas i.e. 274 (91.3%) while 26 (8.7%%) were from rural areas.

By taking into account chosen options of "agree and strongly agree" only of participants, main lecture disturbance factors were evaluated. Figure 1 shows that faculty related factors were the most common linked to lecture disturbance among students followed by environmental factors.

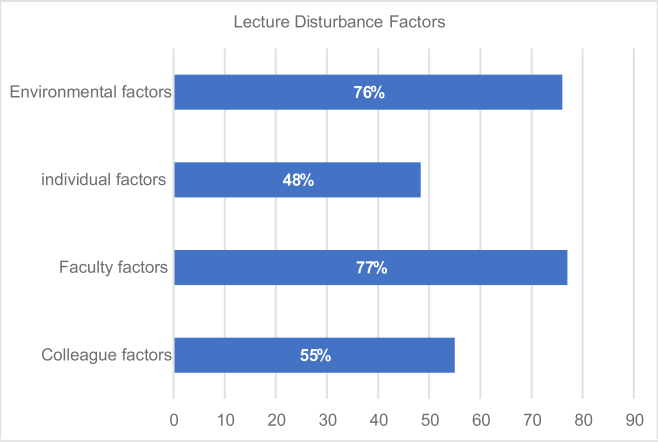

Figure-1: *Distribution of lecture disturbance factors*

Table 1 shows most common factors of each category which students perceived as causing disturbance in lectures. They were arranged from ascending to descending order as per their means distribution.

Table 2 shows comparison on basis of means distribution of socio-demographic factors with lecture disturbance factors. In gender variable, males were more disturbed by colleague and faculty related factors while females got disturbed more by individual and class environment factors. In age group variable, all four disturbance variables were more commonly observed in age group of > 21 years. In case of MBBS class, final year were seen more disturbed by all four lecture disturbance variables and also significant association (p = < 0.05) was observed between MBBS classes and faculty related factors. In case of permanent residence, all four disturbance elements were seen more commonly among urban students and also significant association (p = < 0.05) was seen between permanent residence and class environmental factors. In case of current residence, lecture disturbance elements were more commonly

Table 1: *Common individual factors creating disturbance in students' interaction during lecture*

	Mean ± SD
Colleague related factors (I get upset when)	
Class fellows start talking to each other during the lecture	2.96 ± 1.06
When my colleague makes fun of me for asking questions or raising a point	2.68 ± 1.19
Students interrupt teacher frequently	2.67 ± 1.11
My class fellows ask irrelevant questions	2.51 ± 1.17
Faculty related factors (It upsets me when teacher)	
Delivers long lecture without break	3.57 ± 0.59
Attitude with students is not good	3.24 ± 0.91
Focuses on only few good students in the class	3.17 ± 0.97
Delivers lecture without ensuring whether students understand the topic	3.16 ± 1.01
Speaks too fast	3.10 ± 0.92
Delivers monotonous lecture and without any facial expression	3.08 ± 0.93
Individual student factors	
I have fear of making mistake while asking a question	2.98 ± 0.99
I feel sleepy during lectures	2.74 ± 1.05
I have no personal interaction with teachers	2.34 ± 1.21
Class environmental factors	
Air-conditioning problem	3.12 ± 1.04
Loud noises coming from outside the classroom	3.10 ± 1.05
When I don't hear teacher clearly	3.08 ± 0.99

Table 2: *Means distribution of socio-demographics with disturbance elements*

		Colleague	Faculty	Individual	Environmental
Gender	Male	19.75 ± 6.92	45.97 ± 10.64	21.87 ± 9.26	14.29 ± 4.45
	Female	18.57 ± 6.09	45.05 ± 11.46	22.63 ± 7.82	15.03 ± 4.01
	P value	0.17	0.47	0.45	0.13
Age group	< 21 years	19.07 ± 6.25	45.28 ± 11.51	21.93 ± 8.42	14.47 ± 4.31
	> 21 years	19.23 ± 6.76	45.68 ± 10.72	22.49 ± 8.69	14.80 ± 4.23
	P value	0.84	0.76	0.57	0.5
Class	1st year	18.5 ± 6.22	41.92 ± 12.96	21.92 ± 8.34	13.93 ± 4.78
	2nd year	18.47 ± 6.11	44.77 ± 10.54	20.73 ± 8.43	14.20 ± 4.61
	3rd year	19.62 ± 7.13	47.47 ± 9.97	23.13 ± 7.81	15.08 ± 3.62
	4th year	18.92 ± 6.83	45.83 ± 10.68	21.82 ± 8.35	14.83 ± 4.73
	5th year	20.30 ± 6.37	47.57 ± 10.18	23.65 ± 9.76	15.25 ± 3.34
	P value	0.48	0.03	0.36	0.37
Permanent residence	Urban	19.24 ± 6.39	45.77 ± 10.78	22.45 ± 8.57	14.92 ± 4.03
	Rural	18.31 ± 8.03	42.77 ± 13.44	20.12 ± 8.35	11.96 ± 5.6
	P value	0.49	0.18	0.18	0.001
Are you?	Day scholar	19.29 ± 6.17	46.09 ± 10.37	22.15 ± 8.73	15.01 ± 3.93
	Hostelite	18.78 ± 7.54	43.80 ± 12.77	22.55 ± 8.15	13.62 ± 4.99
	P value	0.55	0.12	0.72	0.013

Table 3: *Association between gender and class with individual disturbance factors elements*

I get upset when students interrupt teacher frequently						
Gender	Strongly Agree	Agree	Uncertain	Disagree	Strongly disagree	P value
Male	46	50	20	29	5	0.04
Female	29	71	25	22	3	
It upsets me when teacher focuses on only few good students in the class						
Male	59	70	11	6	4	0.03
Female	76	49	11	13	1	
I have fear of making mistake while asking a question						
Male	51	55	23	14	7	0.01
Female	46	80	15	8	1	
I have lack of proficiency in English Language						
Male	26	36	30	30	28	0.00
Female	10	46	37	43	14	
I get upset when my or any other's phone rings during the lecture						
Male	25	51	24	28	22	0.04
Female	14	50	39	34	13	

Table 3: *Association between gender and class with individual disturbance factors elements*

I have non-serious attitude						
Male	20	33	37	32	28	0.00
Female	8	30	31	60	21	
I have lack of motivation						
Male	28	40	32	28	22	0.00
Female	10	35	35	50	20	
MBBS class	**It upsets me when teacher taunts/blames student on wrong answer**					
1^{st}year	20	19	5	11	5	0.03
2^{nd}year	28	20	3	6	3	
3^{rd}year	29	21	7	2	1	
4^{th}year	27	17	11	3	2	
Final year	29	20	8	0	3	
It upsets me when teacher focuses on only few good students in the class						
1^{st}year	24	19	4	9	4	0.03
2^{nd}year	25	29	2	4	0	
3^{rd}year	29	24	5	2	0	
4^{th}year	29	18	8	4	1	
Final year	26	27	4	3	0	
It upsets me when teacher focuses on students of opposite gender more						
1^{st}year	25	11	7	6	11	<0.001
2^{nd}year	23	19	10	8	0	
3^{rd}year	23	19	12	6	0	
4^{th}year	24	28	3	4	1	
Final year	26	18	10	1	5	

Table 4: *Association between individual disturbance factors elements with residence*

I get upset when students interrupt teacher frequently						
Current residence	Strongly Agree	Agree	Uncertain	Disagree	Strongly disagree	P value
Day scholar	57	95	39	27	6	0.00
Hostelite	18	24	8	24	2	
It upsets me when teacher taunts/blames student on wrong answer						
Day scholar	101	74	29	11	9	0.03
Hostelite	32	23	5	11	5	
It upsets me when teacher is not well-prepared for the lecture						
Day scholar	76	82	39	18	9	0.00
Hostelite	24	23	7	16	6	
It upsets me when teacher has lack of enthusiasm and interest						
Day scholar	77	98	33	9	7	0.00
Hostelite	25	25	9	12	5	

I get upset when my or any other's phone rings during the lecture						
Day scholar	32	71	48	53	20	0.02
Hostelite	7	29	18	8	14	
I get upset by loud noises coming from outside the classroom						
Day scholar	100	88	20	9	7	0.04
Hostelite	26	32	4	9	5	
Permanent residence	**It upsets me when teacher accent and pronunciation is not understandable**					
Urban	86	113	44	25	6	<0.001
Rural	8	8	2	3	5	
It upsets me when teacher focuses on only few good students in the class						
Urban	122	109	22	18	3	0.04
Rural	11	8	1	4	2	
I get upset by overcrowded class						
Urban	88	91	49	34	12	0.00
Rural	5	6	2	11	2	
I get upset by inappropriate light						
Urban	97	117	34	16	10	0.01
Rural	7	12	0	3	4	
I get upset by when I don't hear teacher clearly						
Urban	107	127	24	8	8	<0.001
Rural	5	11	2	3	5	

Table 5: *Lecture disturbance factors among both genders*

Sr No	Null hypothesis	P value	Decision
1	Distribution of colleague factors is same across categories of gender	0.07	Retain the null hypothesis
2	Distribution of faculty factors is same across categories of gender	0.66	Retain the null hypothesis
3	Distribution of individual factors is same across categories of gender	0.53	Retain the null hypothesis
4	Distribution of environmental factors is same across categories of gender	0.17	Retain the null hypothesis

observed in day scholars except individual factors where prevalence was higher among hostelite, also significant association ($p = < 0.05$) was observed with environmental factors. Table 3 shows individual disturbance factors significant associations with gender and MBBS class of participants. Table 4 shows association between individual factors of lecture disturbance with residence of participants. Mann-Whitney U Test was employed to see any significant association of lecture disturbance factors among both genders as shown in table 5.

Discussion

Among lecture disturbance factors, most common were faculty related factors followed by environmental factors. Distribution of all lecture disturbance factors was same among both genders. Males were more disturbed by colleague and faculty related factors while females got disturbed more by individual and class environment factors. A study done by Cicekci et al showed similar results in which besides students, teachers, and the surroundings, the pupils link themselves also to this issue of disturbance in lectures.[14] A study done by Deepa V. Ramane et al showed that distractions from noise and network accessibility caused learners to lose focus. Prolonged use of electronic devices and insufficient face-to-face communication with educators and classmates resulted in significant physical and mental strain.[15] It

shows similar association with our study where significant association was seen between noise and lecture disturbance, also significant association was seen with insufficient teacher student communication. A study done by Addisu Sewbihon Getie et sl showed that peer groups positively affect students' views which is in contrast to results of this study but physical learning environment, seating arrangements, and classrooms, had a detrimental effect on the attitudes of the pupils which showed similar results to our study.[16]

A research done by Ryan Rafiola et al showed that student achievement was positively and significantly impacted by learning motivation"[17] which is similar to our study where lack of motivation among students contribute to disturbance in their learning behaviour. Study done by Esra Meşe et al also showed that because of faculty related factors, some students had effect on their motivation which contributed to disturbance in lectures. [18] A study done by Hasnan Baber showed that faculty well-preparation about lecture and student motivation had positive impact on learning which is similar to our results.[19] A research done by Lini Diora et al also showed that student fear or shame about asking question related to learning material in lecture contributed to ineffective learning environment and class disturbance[20] which is similar to our study.

A research done by Maike Paulus et al showed that break between lengthy lectures improved student performance and interaction in lecture which contributed to effective learning[21] which is similar to our study where students responded that lengthy lectures affected their interaction and contributed to lecture disturbance. A research done by Marion Scherzinger et al showed that there was little to moderate consensus between student-teachers on interruptions in the classroom, and there was little correlation between the teacher-student interaction leading to lecture disturbance[22] which is in contrast to our results because we found significant associations among them.

Efficient learning requires efficient learning environment and involves many factors including faculty, students' personal and environmental factors. Faculty and environmental factors contributed most to disturbance in lectures in our study followed by colleague factors which signifies the importance that to improve learning behaviour in lectures, all stakeholders should contribute and play their role. This study touches on an underexplored area and provides new insights into the current literature. The study is contextually grounded so that it could also be used for practical implications to stakeholders within that setting. A carefully designed data collection tool and an adequate size sample improved the reliability and validity of findings. The use of a first-come, first-served approach in selecting participants may have introduced selection bias, as early respondents could differ in motivation, technological familiarity, or academic interest compared to late responders. A randomized selection method within each quota would have been more robust. Since the data collection relied solely on an online Google Form, students with limited internet access or lower interest in digital surveys may have been inadvertently excluded, contributing to potential non-response bias.

Conclusion

Males were more concerned by factors connected to colleagues and teachers, whereas females were more disturbed by factors related to individuals and the classroom environment. Educators may create a learning environment that is more inclusive and conducive to engagement and academic achievement by addressing the unique needs and obstacles that male and female students confront.

Ethical Approval: The Institutional Ethical Committee, Aziz Fatimah Medical & Dental College, Faisalabad approved the study vide letter. Ref No. IFC/235-23.

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Authors' Contribution:

MD: Conception & design, analysis & interpretation of data, drafting manuscript, critical revision for important intellectual content, final approval

AK: Acquisition of data, critical revision for important intellectual content

TA: Acquisition of data, Literature search, drafting manuscript

RI: Acquisition of data, drafting manuscript

EJ: Acquisition of data, drafting manuscript

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