https://doi.org/10.29309/TPMJ/2026.33.11.10727 www.theprofesional.com

ORIGINAL ARTICLE

Attention span crisis: Factors affecting focus during medical lectures among medical students of Nishtar Medical University — A cross-sectional study.

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ABSTRACT… Objective: To identify and quantify the factors associated with reduced attention span during lectures among medical students at Nishtar Medical University, focusing on students, pedagogy, teaching methods and determinants related to environment. **Study Design:** Cross-sectional Survey. **Setting:** Nishtar Medical University, Multan. **Period:** March 2026 to October 2026. **Methods:** A structured questionnaire was used, we assessed eleven factors affecting attention span. Students also rated their perceived concentration over the course of a typical lecture. Descriptive statistics characterized the prevalence of these distractors; multivariate logistic regression was used to examine associations between these factors and self-reported attention decline during lectures. **Results:** A large proportion among the respondents reported declining attention during lectures which is by the various distractors which we have studied. Key student-related factors significantly associated with concentration loss included psychological factors such as lack of personal interest and post lunch meal status and peer distraction. Negative emotional background is also correlated with reduced focus. Regarding pedagogical variables, insignificant use of audiovisual aids and passive lecturing style and teaching methodologies were linked to lower sustained attention. Environmental factors, particularly noise pollution and poor lighting or ventilation, were also significant predictors of concentration decline. In regression analysis, for example, students who reported distractions from noise pollution had greater attention decline as compared to those who did not, controlling for various other variables. In our study of 219 medical students, attention-span difficulties were highly prevalent, with major contributors including impaired concentration (89.04%), emotional impact (86.76%), environmental noise (83.56%), diet (81.28%), lack of interest (73.06%), teaching method (72.15%), study material (61.64%), and prior knowledge (54.79%). **Conclusion:** Our study indicates that a multifactorial "attention span crisis" affects medical students during lectures, encompassing individual environmental, and pedagogical contributors. To mitigate or eradicate this decline, medical educators should consider more interactive teaching, improvements needed in teaching styles, optimized classroom environments, and scheduling considerations (e.g., meal timing) to maintain and improve student engagement.

Key words: Attention Span, Medical Lectures, Concentration, Medical Students, Pedagogical Factors, Environment.

Article Citation: Tufail N, Siddiqui SS, Khan H, Riaz S, Khalid R, Shaheen A. Attention span crisis: Factors affecting focus during medical lectures among medical students of Nishtar Medical University — A cross-sectional study. Professional Med J 2026; 33(11):2352-2357. https://doi.org/10.29309/TPMJ/2026.33.11.10727

INTRODUCTION

Sustained attention during lectures is critically important for effective learning in medical education Students concentration during lectures has always been an important issue for educational professionals, with the traditional lecture practice sometimes dubbed as ineffective.[1] Research consistently shows that students' concentration is usually at peak early in a lecture and declines with time means reduced at the end. A classic study of medical students using real-time measures found that concentration rises sharply to a maximum within 10–15 minutes, before it steadily starts to deteriorate, which suggests that traditional 60-minute lectures may exceed students' optimal attention span.[2] Beyond time, attention is influenced by various other factors—student-related, teaching-related, and environment-related. For instance, internal motivation, peer distractions, and emotional stability significantly affect overall attentiveness.[3] In a study of 300 medical students in South India, personal interest in the subject and emotional well-being were strongly associated with concentration level of students.[4] Similarly, meal status (e.g., post-lunch drowsiness) has been identified as an important physiological determinant of attentiveness

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Article received on:
20/05/2026
Date of revision:
21/07/2026
Accepted for publication:
22/07/2026

in classrooms during lectures.[5]

Pedagogical characteristics and teaching methodologies also play a vital role. A recent BMC Medical Education study used speech-recognition and face-recognition technology to show that linguistic features of teachers, specifically voice volume and question frequency, positively influence student concentration.[6] Interactive teaching methods, including the use of audiovisual aids and student-centered techniques, have been shown to improve both knowledge retention and motivation in medical students.[7] Environmental conditions further modulate attention to some extent. A study at Qom University of Medical Sciences found noise pollution and inadequate lighting or ventilation among the most significant external factors responsible for impaired and declining attention.[8] Consistent with this, the subjective views of medical students have mentioned peer distractions, classroom environment, and lecture duration as major hindrances in maintaining focus.[9] Global evidence also highlights that digital distractions, such as mobile-phone multitasking, significantly reduce attention span in lecture settings.[10] Additionally, cognitive load theory suggests that excessive or poorly structured material can overwhelm working memory, further reducing sustained attention during lectures.[11]

In Pakistani medical institutes, similar attention-related concerns have been documented, including challenges related to teaching style, overcrowded lecture halls, and environmental discomfort.[12] Studies also indicate that emotional background and academic stress among Pakistani medical students contribute substantially to reduced attention and concentration during lectures.[13] A recent cross-sectional study among first-year medical students shows a quite similar pattern: attention was highest during the first 10 minutes of a lecture then declined, and there was only a transient rebound at the end. Importantly, that study also linked poorer attention with inadequate sleep and disturbed routine, underscoring the role of physiological factors.[14]

There is a lack of research that determines the combined influence of these factors, especially integrating physiological (meal, emotional), pedagogical, peer, and environmental domains, specifically in the context of Pakistani medical schools. At Nishtar Medical University, lectures remain a central part of the curriculum, not wrong to say the whole education system,understanding what specifically disrupts student focus in this setting could guide targeted pedagogical and infrastructural reforms in a better way.

Therefore, this study aims to assess how the eleven factors identified in our questionnaire (clinical orientation, prior knowledge, volume of material, interest, meal status, peer distraction, emotional background, audiovisual usage, teaching method, noise, lighting/ventilation) relate to self-reported attention span among MBBS students at Nishtar Medical University. By identifying the strongest predictors of concentration decline, we aimed at providing evidence-based recommendations for improving lecture delivery and learning environments in our institution.

METHODS

This cross sectional study was conducted at Nishtar Medical University, Multan. Data collection was carried out during scheduled class hours for the defined study period, from March 2026 to October 2026.Ethical approval was obtained from IREB (Ref. no. 6890) of the Nishtar Medical University .A total of 200 medical students were enrolled from pre-clinical and clinical years. Students from programs other than MBBS program were excluded. Applying the WHO Geneva sample size determination formula [1], with a Confidence level of 95% and a confidence limit of 5%, a sample size of 200 students was determined.

Formula $n = Z^2 \times p(1-p) / d^2$

Where: Z = 1.96(95%), p = 0.5 (50% prevalence, using the study conducted in south India[4]), d = 0.05 n = 200. Data collection was done using a structured, self-administered questionnaire after taking written informed consent from all participants, piloting and making necessary adjustments in a paper format and online through Google Forms. Participation was kept strictly anonymous, and confidential. The data entered and analyzed using SPSS version 26. Demographic variables, attention scores, and other relevant variables were summarized using

descriptive statistics: frequencies, percentages, means ± standard deviation.

RESULTS

Among 200 medical students participated in this research the highest frequency of students was in the 4th year, approximately 98 students (45%), followed by relatively equal frequencies in the 1st, 2nd, and 3rd years, approximately 33 students (15%). In terms of Gender, the sample showed a slight female predominance, with 124 students (56.62%) being female and 95 students (43.38%) being male. A series of Chi-Square tests for dependence were conducted to examine the relationship between a student's perceived Concentration Level (Concentration: Yes/No) and nine other factors. The significance level was set at d= 0.05, significant Associations ($p < 0.05$). The analysis identified statistically significant associations between a student's perceived Concentration Level and four factors: Emotional Impact, Diet/Meal Status, Interest, and Teaching methodology. The remaining five factors showed no statistically significant association with the perceived Concentration Level.

DISCUSSION

This study explored the prevalence of poor attention during lectures among medical students at Nishtar Medical University and examined behavioural, lifestyle, personal, and environmental factors associated with reduced focus. The findings indicate that poor attention is a frequent issue, similar to trends reported in a study from Punjab Pakistan, where sustained concentration typically declines after the first 10–20 minutes of passive learning.[15]

TABLE-I

Descriptive statistics of participants' age and year of study (n=200)

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Age	200	8	17	25	21.65	1.694
Year	200	4	1	5	3.22	1.242

TABLE-II

Chi-square analysis for factors with concentration level (n=200)

Variables Paired with Concentration Level	Response	Concentration No N 200(%)	Concentration Yes N 200(%)	X2 statistics	Degree of Freedom	P-Value	Significance
Emotions	No	20(44.4%)	25(55.6%)	6.074	1	0.008	Significant
	Yes	10(6.5%)	145(93.5%)				
Diet	Yes	17 (37.8%)	28 (62.2%)	14.120	1	<0.001	Significant
	No	13 (8.4%)	142 (91.6%)				
Interest	No	19 (42.2%)	26 (57.8%)	4.499	1	0.034	Significant
	Yes	11 (7.1%)	144 (92.9%)				
Teaching methodology	No	21 (46.7%)	24 (53.3%)	5.132	1	0.023	Significant
	Yes	9 (5.8%)	146 (94.2%)				
Noise	No	15 (33.3%)	30 (66.7%)	2.553	1	0.110	Non-Significant
	Yes	15 (9.7%)	140 (90.3%)				
Gender	Female	24 (15.5%)	131 (84.5%)	0.008	1	0.929	Non-significant
	Male	6 (13.3%)	39 (86.7%)				
Environment	No	25 (16.1%)	130 (83.9%)	0.035	1	0.852	Non-Significant
	Yes	5 (11.1%)	40 (88.9%)				
Material	No	21 (46.7%)	24 (53.3%)	0.223	1	0.637	Non-Significant
	Yes	9 (5.8%)	146 (94.2%)				
Year of study		30 (15.0%)	170 (85.0%)	1.765	1	0.779	Non-Significant

Poor sleep quality was one of the most important factors related to diminished attention. This is consistent with studies showing that inadequate, improper, and disturbed sleep impairs memory, alertness, and academic performance among university students.[16] Medical students often experience irregular and disturbed sleep due to academic pressure, making them more vulnerable to drowsiness and slow cognitive processing during lectures.[17] Frequent checking of notifications and multitasking can disrupt working memory and distract students from the main lecture content.[18] This pattern has been observed in modern classrooms, where distractions due to digital tools are increasingly competing with academic activities.

Psychological stress further contributes a major part to poor attention. High stress levels impair concentration and reduce cognitive efficiency, which aligns with existing evidence showing emotional and psychological factors as major contributors to inattentiveness among medical students during lectures.[19] Our study also found that teaching methods and style significantly influence student attention during lectures. Interactive teaching strategies, such as audiovisual aids or active questioning, were associated with better focus. Similar findings were reported in a recent study from South India, which showed that students' attentiveness improved when instructors used visual and interactive tools instead of solely didactic approaches.[20] These methods help re-engage students when their natural attention span begins to decline. Environmental conditions, including lighting, ventilation, and classroom noise, also affected attention levels including poor acoustics or external noise that can disrupt concentration.[21] This is supported by our research that classroom noise interferes with learning and reduces student engagement in educational activities. Likewise, inadequate lighting or ventilation can lead to discomfort and reduced mental alertness, consistent with studies highlighting the role of classroom environments in learning effectiveness among students.[22] Intrinsic interest in the subject was an important personal factor which influenced students' attention. Students who were more motivated or interested in the topic tended to remain more focused. This observation aligns with evidence that academic motivation strongly predicts learning engagement and performance.[23] Peer-related distraction also played a role; students reported reduced concentration when their friends were not attentive, talking, or using mobiles during lectures .Group behavior and peer influence have been shown to affect individual classroom attentiveness.[24] Overall, our study findings support the results of already existing research from both local and international contexts. The combination of internal factors (sleep, stress, interest), lifestyle factors (mobile phone use, sleeping habits), external factors (environmental conditions), and instructional factors (pedagogy, teaching method) reflects the multifactorial nature of attention recognized worldwide. Similar studies have also reported that gender differences are quite small, suggesting that attention issues are common among all subgroups (males, females) of medical students.[25]

CONCLUSION

This study concluded that a multifactorial combination of internal and external factors impact attentiveness and concentration of medical students during lectures. Internal factors including personal interest in the subject matter, motivation, emotional stability, stress levels, and overall physiological wellbeing, play a significant role in determining the overall academic attentiveness of a medical student. At the same time, external elements such as teaching methods pedagogical factors, instructional clarification, classroom design, students interactions, and the broader learning environment also contribute to the attention span of students to some extent.

Importantly, the study found no significant differences between male and female students in terms of the factors influencing their concentration. This concludes that any strategies used at improving attentiveness should be generally applicable rather than gender-specific.

Considering the demanding nature of medical education, it becomes highly important for academic institutions to design learning environments that are supportive, and augmented for cognitive engagement of medical students to improve their attention span. Educators should prioritize active learning techniques, interactive sessions, clear

communication, and adaptable teaching methods that accommodate diverse learning methods. In addition, equal emphasis must be placed on student's psychological and physical wellbeing by providing access to counseling, stress management programs, and wellness initiatives that can drastically strengthen student's capacity to maintain concentration.

Future research and educational efforts should aim to develop evidence based strategies that promote consistent attention among medical students. These may include attention training programs, improved curricular design, mindfulness practices, and the use of innovative technology that increases student's participation. By addressing both the individual and environmental factors of focus, institutions can promote better academic performance, improved learning experiences, and ultimately more competent and confident future healthcare professionals.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

SOURCE OF FUNDING

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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AUTHORSHIP AND CONTRIBUTION DECLARATION	
1	**Nadia Tufail:** Study design, data analysis.
2	**Sana Shaukat Siddiqui:** Drafting, acquisition of data.
3	**Hamna Khan:** Proof reading.
4	**Sumaira Riaz:** Acquisition of data.
5	**Rubab Khalid:** Data collection.
6	**Azra Shaheen:** Data entry.