Comparison of attention span between different years of a medical college

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Abstract

Objective: To determine the association between attention span and the academic year among medical students, and to identify the factors affecting the attention span.

Method: The cross-sectional study at the Foundation University Medical College, Islamabad, Pakistan, from July to August 2022, and comprised medical students from 1st to 5th academic year. Data was collected using the online Attention Control Scale questionnaire. Data was analysed using SPSS 26.

Results: Of the 285 subjects with mean age 21.1+1.68 years, 195(68.4%) were females and 90(31.6%) were males. The mean score among the males was 50.31±6.37 compared to 48.12±7.12 for the females. Third-year students had the lowest mean score 46.67±7.02, while fourth-year students scored the highest 49.98±6.67. Significantly influenced internal factors were emotions about 154(54.7%), while longer courses 196(68.8%) and nearby noises 118 (41.4%) were additional factors. Finally, 204(71.6%) students struggled while listening to a one-hour class, and 148 (52.28%) preferred problem-based learning and small group discussions as teaching methods.

Conclusion: Traditional lectures and long group discussions affected students' attention span negatively, with external factors, like course length and loud surroundings, and internal factors, like emotions and learner type, having an influence.

Key Words: Attention span, Internal and external factors.

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Introduction

Attention span refers to the time a person can focus on a task without distraction. Digital devices have significantly impacted human ability to maintain focus, and sustain attention.[1,2] Attention span indicates the ability of cognitive engagement on a particular task or stimulus, and it plays a fundamental role in learning, productivity and overall cognitive functioning. Concerns about attention span have become prevalent, leading to a growing body of research exploring its nature, determinants and consequences. Understanding attention span is crucial as it can significantly impact various domains, such as education, workplace productivity, and mental wellbeing.

Attention is composed of different components.[3] Focussed attention involves maintaining cognitive activity on a task or stimulus over a prolonged period, while sustained attention is selective concentration on a discrete aspect of information while ignoring other perceivable information.

Sustained attention is crucial for efficient coding of information into memory, a cognitive process essential for long-term knowledge acquisition and retrieval. Both memory and attention are integrated.[4] In the field of medicine, attention is crucial for professional development.

Understanding attention span is crucial for improving learning outcomes. Factors like lecture duration, sleep quality, stress, eating habits, health, noise and personal issues affect cognitive performance, leading to lapses and slowed responses. Studies show that young learners have a shorter attention span (5-7 minutes) compared to adult learners (10-15 minutes).[5] Therefore, lecture length and active learning strategies are essential to maintain student engagement and to maximise attention span in educational settings.[6]

The current study was planned to determine the association between attention span and the academic year among medical students, and to identify the factors affecting the attention span.

Subjects and Methods

The descriptive, cross-sectional study was conducted at

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the Foundation University Medical College (FUMC), Islamabad, Pakistan, from July to August 2022. The Ethical Review was obtained by Ethical Review Committee of Foundation University Medical College in July 2022. The sample size was calculated using Rao soft calculator[7] with a 5% margin of error and 95% confidence interval (CI). The sample was raised using stratified random sampling technique with focus on probability proportional to size (PPS) to ensure equal representation across different years of medical education. Those included were medical students of either gender from academic year 1 to 5. Students with an attendance <60% and those diagnosed with attention deficit hyperactivity disorder (ADHD) were excluded.

After taking informed consent from the subjects, data was collected using the Attention Control Scale (ATTC) which has reported internal consistency of 0.93 and reliability 0.74-0.93.[7] The tool was used after taking permission from the American Psychological Association.[8] The internal consistency of the questionnaire in the current study yielded Cronbach's alpha value of 0.88, indicating good reliability. The scale consists of three subscales: ATTC-TOT (Total Attention), ATTC-FOC (Attention Focussing) and ATTC-SHIF (Attention Shifting). The questionnaire included demographic variables, internal factors and external factors influencing the attention span.

Data was analysed using SPSS 26. Data was expressed as mean ± standard deviation, or frequencies and percentages, as appropriate. Independent sample t-test was used for 2-group comparison, while one-way analysis of variance (ANOVA) was used for 3 or more groups. Chi-square test was used to compare significance of relationships between variables. P<0.05 was considered significant.

Results

Of the 285 subjects with mean age 21.1+1.68 years (range: 17-25 years), 195(68.4%) were females and 90(31.6%) were males. There were 64 (22.5%) students from the second year, followed by 60 (21.1%) third year, the 57 (20%) first year, 54 (18.9%) fourth year and 50 (17.5%) final year. The mean score among the males was 50.31±6.37 compared to 48.12±7.12 for the females (p=0.319). Third-year students had the lowest mean score 46.67±7.02, while fourth-year students scored the highest 49.98±6.67. Attention span varied across different academic years, but had non-significant association with attention focussing (p=0.168), attention shifting (p=0.145) and total attention (p=0.101). Attention focussing took a dip in the first 3 years, and steadily increased during clinical years, while attention shifting kept fluctuating across the academic years (Figure 1).

Significant internal factors were emotions 154(54.7%), while longer courses 196(68.8%) and nearby noises 118 (41.4%) were additional factors. External factors, like

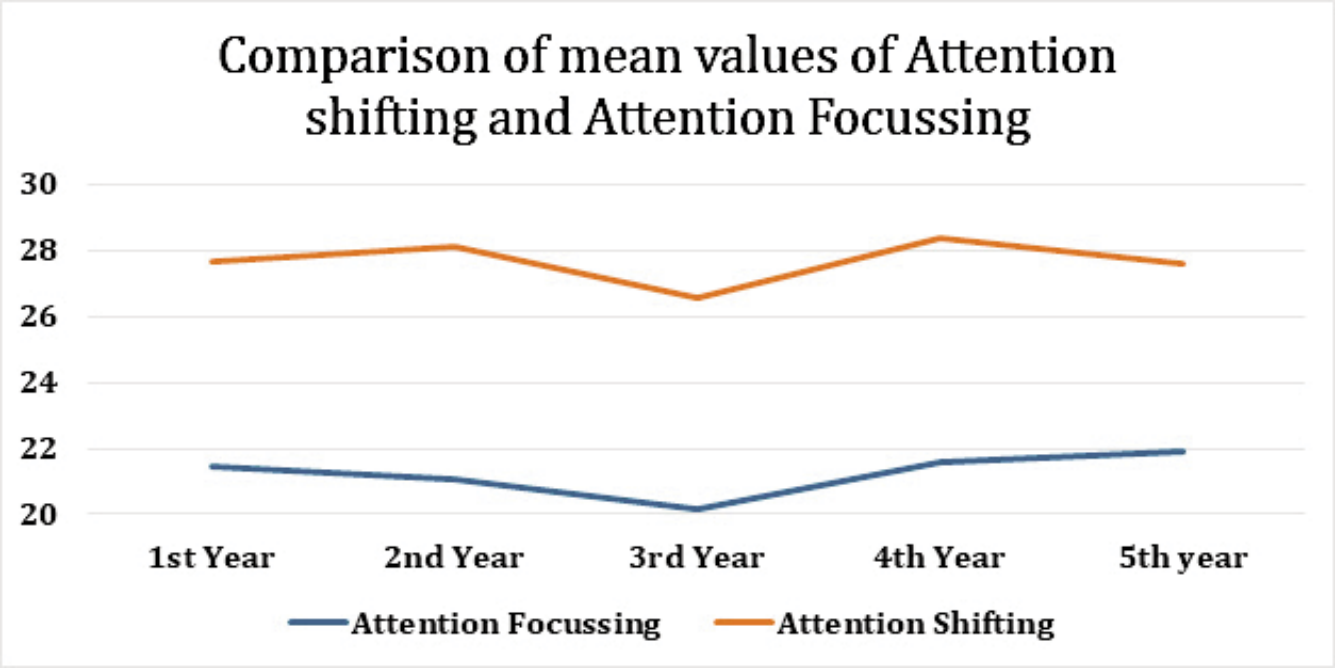

Figure-1: Attention focusing took a dip in the first 3 years, but steadily increased during clinical years, while attention shifting remained fluctuating across the academic years.

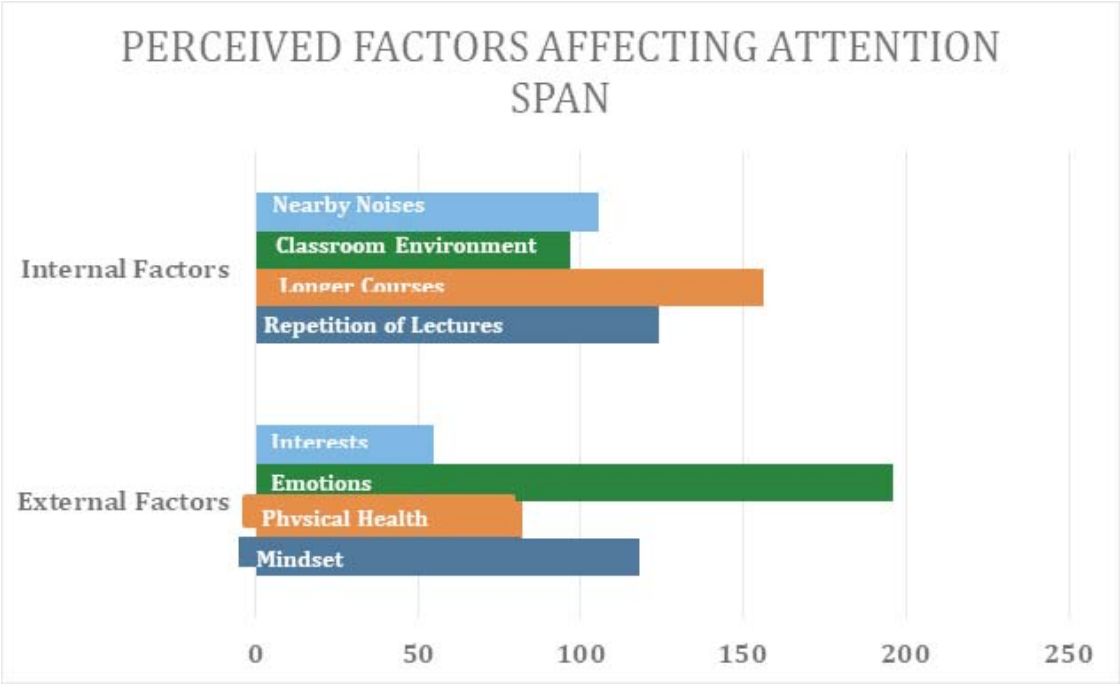

Figure-2: External and Internal Factors Affecting Attention Span.

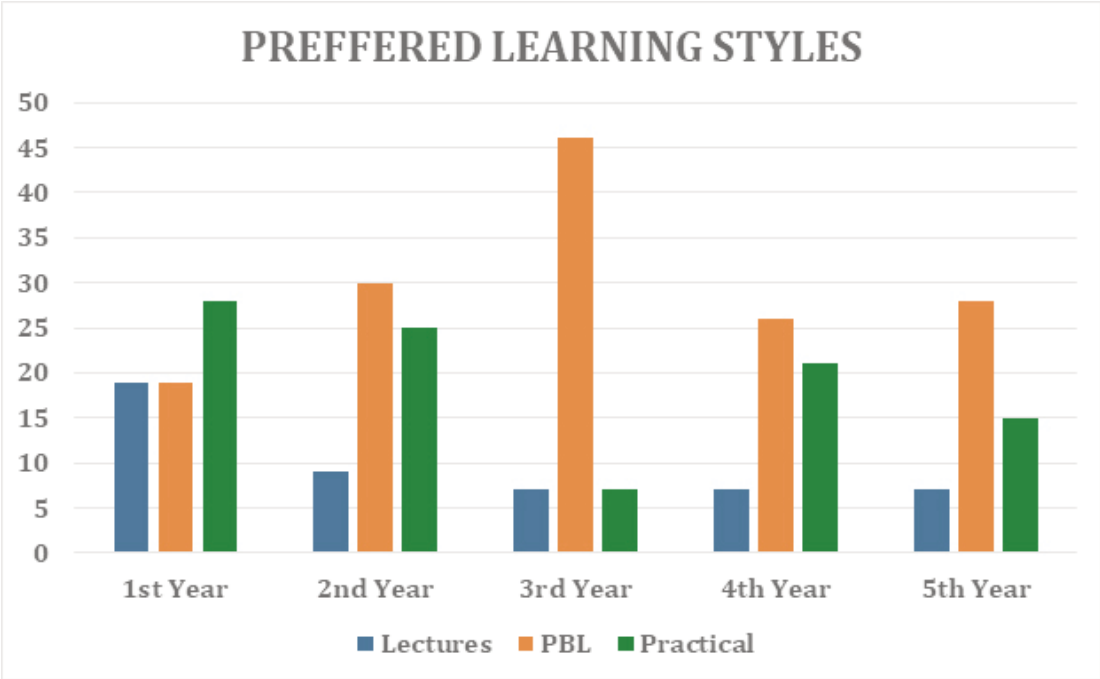

Figure-3: Preferred Learning Style by Different Years of Medical College.

course length and nearby noises, were also noted, with 204(71.6%) students struggling while listening to a one-hour class (Figure 2). Overall, 148 (52.28%) students preferred problem-based learning (PBL) and small group discussions (SGDs) as teaching methods (Figure 3). There were 110(38.6%) visual learners, and 30(10.5%) were kinesthetic learners.

Discussion

A strong attention span is crucial for students' academic success, as it helps them stay focussed, absorb information, and engage in learning activities.[8] Attention span is positively correlated with students' ability to concentrate, comprehend complex concepts, and perform well in exams and assignments, ultimately shaping their academic achievements and overall learning outcomes.[9] As they are better equipped to sustain their focus, they process information deeply, and actively contribute to classroom discussions.[10] The findings of the current study suggests that attention span may not be directly influenced by advancing years of medical education. It is important to consider that attention span is a complex construct influenced by various factors, and the progression of years in medical education alone may not be sufficient to impact this aspect of cognitive functioning. In the current study, the correlation between attention span and age or year of study was not significant, but a trend of attention span going down in the third year of medical school and rising towards the final year was noted (Figure 1). As students progress through medical education, they experience attitudinal changes, such as increased cynicism and empathy towards patients, that are often linked to the transition from preclinical to clinical years.[11] exposing students to real-world medical settings. Further research is needed to explore the intricate relationship between attention span and medical education progression, considering additional variables, such as stress levels, workload and coping mechanisms employed by the students. Several studies indicate that attention span can vary among individuals based on various factors, such as gender and age.[12] However, the current study only looked at a specific population; that of medical students.

The current study found no significant difference in attention span between male and female participants. While the mean scores showed a slight disparity, the lack of statistical significance implied that any observed difference could be due to random variation or other factors unrelated to gender. Generally, girls tend to have longer attention spans[13] because they are stronger in the verbal-emotive area, whereas boys are more inclined towards kinesthetic and visual-spatial activities.[14] There is no strong evidence suggesting a gender effect.[15] Research suggests that males have greater vigilance.[16] Another study reported significant gender differences in sustained attention and related it with sociocultural factors of gender inequality. However, even that study admitted that wherever there was minimal disparity, the gender factor became non-significant.[17]

In the current study, 52.28% students preferred PBL mode of learning, which is one of the most effective and engaging education methods[18], allowing the students to actively participate in their own learning, develop essential skills for the future, and retain knowledge in the long term.[19] Traditional learning is the least preferred teaching method, as it has been around for 600 years without significant changes.[20] Also, in this type of learning, the students remain passive learners. They cannot communicate directly with the teacher, and have no conditions for self-study and decision-making.[21]

When evaluating unimodal methods, visual learning was the most cited method (38.59%), while kinesthetic learning was the least favoured (10.52%) in the current study. Students from first to final year also tended to prefer visual learning. Based on research, the predominant learning style identified in medical colleges is kinesthetic[22,23] learning which involves whole body movement, strengthening relationships, enhancing students' capacity to derive meaning, and fostering rigour.[24]

The attention span is crucial for students' academic achievements and long-term success. High level of attention span indicates high academic achievements.[25] The current study found that 71.6% students struggled to maintain their attention span in a 1-hour lecture, which should not exceed 15 minutes.[2] However, keeping in mind the burden of medical studies, this is not practical.

To improve attention span, incorporating humour,[26] physical activity, and visual aids can promote retention and optimise classroom environments.[27]

Students' learning processes are influenced by various external and internal factors[6], which were also noted in the current study, including noise, side conversations, and passing individuals. Higher noise levels can disrupt learning and make it difficult for students to understand instructions[28], potentially resulting in errors.

The physical atmosphere of the classroom, including seating arrangement, can also influence focus. For instance, sitting next to friends may lead to off-topic conversations and loss of concentration.[27] Classroom management strategies eployed by the faculty also affect attentiveness.[29] Emotions also influence attention[30], particularly in the medical field where job opportunities are limited. Physical health is another crucial as poor health increases the likelihood of academic difficulties.[31] Distractions and poor attention span may hinder students from fully engaging in hands-on clinical experiences, which are essential for developing practical skills.

Addressing attention barriers is vital for optimising learning experiences and maximising educational outcomes.

The current study has limitations as it was conducted at a single private-sector medical institution. Future studies should include public-sector medical colleges to improve generalisability of the findings.

To optimise the learning process, the students should be trained to avoid distractions by managing internal and external factors. Faculty should focus on motivating workshops, engaging materials and activities, a positive environment and active participation.

Conclusion

Medical students' attention span could be influenced by a variety of perceived internal and external elements, including emotions, classroom atmosphere and surrounding noises. Majority of the students expressed their inability to listen to a one-hour lecture. PBL and SGDs were preferred by the students.

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AUTHOR'S CONTRIBUTION:
HFB: Proposed topic of study, literature review, writing and interpretation of results.
MT: Literature review, writing and data collection.
MF: Literature review and writing.
AT: Data collection and literature review.
AA: Data analysis and writing.
NA: Data analysis, writing and final approval.
MR: Data collection and statistical analysis.