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Aggression Among Undergraduate Medical Students: A Cross-sectional Study Using the Buss–Perry Questionnaire at a Tertiary Institution in Northern India

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Abstract **Background:** Aggression among medical students is an underexplored but critical issue that can affect academic performance, peer relationships, and future professional behavior. This study aimed to assess levels of aggression and explore its association with key demographic, lifestyle, and psychosocial variables among MBBS students at Indira Gandhi Medical College, Shimla. **Methods:** A cross-sectional study was conducted using the Buss and Perry Aggression Questionnaire (1992) via a structured Google Form. A total of 202 undergraduate medical students, spanning first to fourth year (Batch 1–4), participated. Variables assessed included gender, age group, type of family, sleep duration, alcohol and smoking habits, exercise, meditation, music listening, romantic relationship status, and internet use. Statistical analyses included independent samples t-tests, one-way ANOVA, and descriptive statistics using Epi Info version 7 software. **Results:** The mean total aggression score was 123.97 (SD = 16.16). Males scored significantly higher than females ($p = 0.011$), and students in a romantic relationship exhibited greater aggression ($p = 0.042$). A significant variation was observed across academic years ($p < 0.001$), with 2nd and 4th year students showing the highest scores. Sleep duration was significantly associated with aggression ($p = 0.002$); students sleeping <6 hours had the lowest scores, whereas those sleeping 6–8 hours or >8 hours had higher aggression levels. Other variables such as type of family, alcohol/smoking habits, exercise, meditation, and music showed no statistically significant associations. **Conclusion:** Aggression in medical students appears influenced by gender, relationship status, academic year, and sleep patterns, underscoring the need for psychological screening and targeted wellness interventions within medical curricula. While some lifestyle factors showed no significant associations, their observed trends merit further exploration in larger and more diverse samples.

Key Words Aggression, medical students, buss-perry questionnaire, gender differences, sleep, romantic relationships, medical education, MBBS, psychosocial factors, India

INTRODUCTION

Aggression is a complex psychological construct characterized by behaviors, thoughts, or emotions intended to cause harm or assert dominance. While a certain degree of assertiveness is necessary in high-pressure professions like medicine, excessive aggression can compromise professional conduct, interpersonal relationships, academic performance, and mental well-being [1-4]. Among medical students who are frequently subjected to high academic demands, emotional fatigue, and lifestyle irregularities understanding aggression becomes particularly important for promoting holistic development and psychological resilience.

The World Health Organization recognizes mental health as a critical component of health, yet psychological well-being among medical students is often overlooked. Previous literature suggests that medical students may experience elevated levels of stress, irritability, and burnout compared to peers in non-medical fields. These factors, when left unmanaged, can manifest as aggression in various forms verbal, physical, cognitive, or emotional. Understanding the prevalence and patterns of aggression among this population is, therefore, essential for both preventive and interventional strategies [5-8].

The Buss and Perry Aggression Questionnaire (1992) is a validated and widely used self-report tool that dissects

aggression into four measurable domains: Physical Aggression, Verbal Aggression, Anger, and Hostility. This multi-dimensional approach allows for a nuanced understanding of not just behavioral manifestations but also emotional and cognitive aspects of aggression [9-11].

This study was conducted at Indira Gandhi Medical College (IGMC), Shimla, Himachal Pradesh, India, and involved undergraduate medical students from all academic years (1st to 4th year MBBS). Utilizing an online Google Form for data collection, the study aimed to measure aggression levels using the Buss and Perry framework and to examine how demographic and lifestyle variables including gender, sleep duration, relationship status, substance use, and others relate to aggression profiles.

By exploring these associations, this research not only contributes to the literature on aggression among Indian medical students a relatively underexplored population but also offers insights for faculty, counselors, and institutional policymakers to design targeted psychological support systems within medical colleges.

METHODS

Study Design and Setting

This was a cross-sectional, quantitative study conducted at Indira Gandhi Medical College (IGMC), Shimla, one of the premier government medical institutions in Himachal Pradesh, India. The study aimed to assess the aggression profiles of undergraduate MBBS students using the Buss and Perry Aggression Questionnaire (1992) and to explore associations with selected demographic and lifestyle variables.

Participants

The study sample included 202 MBBS students from four academic years, referred to as:

- Batch 1 – 1st-year MBBS
- Batch 2 – 2nd-year MBBS
- Batch 3 – 3rd-year MBBS
- Batch 4 – 4th-year MBBS

Participants were selected through convenience sampling, and inclusion was voluntary. All participants provided informed consent prior to participation.

Data Collection Tool

Data were collected through a Google Form comprising:

- Demographic and lifestyle questions: including age, gender, family type, alcohol use, smoking status, sleep duration, internet use, exercise habits, meditation, music listening, history of expulsion, and relationship status.
- Aggression Questionnaire (AQ): A validated 29-item self-report scale developed by Buss and Perry (1992), which assesses aggression across four subscales:
  - Physical Aggression (PA)
  - Verbal Aggression (VA)
  - Anger (A)
  - Hostility (H)

Each item was rated on a 5-point Likert scale (1 = extremely uncharacteristic of me; 5 = extremely characteristic of me). Items 9 and 16 were reverse-scored as per the original scoring protocol.

Scoring Procedure

- Subscale scores were calculated by summing the scores of corresponding items.
- A Total Aggression Score was computed as the sum of all four subscales.
- Aggression scores were further categorized into Low, Average, and High based on tertiles for categorical analysis.

Statistical Analysis

Data were analyzed using Epi Info version 7 software. The following statistical techniques were applied:

- Descriptive statistics for frequencies, means, and standard deviations.
- Independent t-tests and One-Way ANOVA for group comparisons.
- Chi-square tests to examine associations between categorical variables and aggression levels.

A p-value of <0.05 was considered statistically significant.

RESULTS

A total of 202 undergraduate medical students from Indira Gandhi Medical College, Shimla, participated in the study. The sample was well-distributed across academic years: Batch 1 (1st year MBBS) and Batch 4 (4th year MBBS) each comprised 20.8% of the participants, Batch 2 (2nd year) accounted for 23.3%, and Batch 3 (3rd year) represented 35.1%. The gender distribution included 42.1% males and 57.9% females. The majority of students came from nuclear families (69.3%). Most participants reported no history of alcohol (85.6%) or smoking (87.6%), and a large proportion did not engage in regular exercise (80.7%) or meditation (86.6%). Music listening was nearly universal (96%), while 30.2% reported being in a romantic relationship. Sleep duration was mostly between 6–8 hours (87.6%), and 68.8% of students reported using the internet for more than 2 hours daily.

Comprehensive group-wise analysis of total aggression scores revealed both statistically significant and non-significant differences across a range of demographic and behavioral variables.

Gender was significantly associated with aggression scores. Male students (n = 85) had a mean total aggression score of 127.36 (SD = 17.67), which was significantly higher than that of female students (n = 117), who scored 121.50

Table 1: Descriptive Statistics for Demographic and Lifestyle Variables (N = 202)

Variable	Category	Number	Percentage
Batch	1	42	20.8%
	2	47	23.3%
	3	71	35.1%
	4	42	20.8%
Age Group	≤ 20 years	113	55.9%
	> 20 years	89	44.1%
Gender	Male	85	42.1%
	Female	117	57.9%
Type of Family	Nuclear	140	69.3%
	Joint	62	30.7%
Alcohol Use	Yes	29	14.4%
	No	173	85.6%
Smoking	Yes	25	12.4%
	No	177	87.6%
Exercise	Yes	39	19.3%
	No	163	80.7%
Meditation	Yes	27	13.4%
	No	175	86.6%
Music Listening	Yes	194	96.0%
	No	8	4.0%
BF/GF (Relationship)	Yes	61	30.2%
	No	141	69.8%
Expulsion History	Yes	11	5.4%
	No	191	94.6%
Sleep Duration	< 6 hours	6	3.0%
	6–8 hours	177	87.6%
	> 8 hours	19	9.4%
Internet Use	< 2 hrs/day	63	31.2%
	≥ 2 hrs/day	139	68.8%

Table 2: Group Comparisons on Total Aggression Score (AQ)

Variable	Group	Mean (SD)	Test	p-value
Gender	Male	127.36±17.67	t = 2.580	0.011
	Female	121.50±14.56		
Age Group	≤ 20	123.18±16.81	t = -0.785	0.433
	> 20	124.98±15.33		
Family Type	Nuclear	122.81±15.71	t = -1.533	0.127
	Joint	126.58±16.96		
Alcohol Use	Yes	123.41±13.91	t = -0.200	0.842
	No	124.06±16.54		
Smoking	Yes	125.72±11.85	t = 0.577	0.564
	No	123.72±16.69		
Exercise	Yes	125.18±16.73	t = 0.519	0.604
	No	123.68±16.06		
Meditation	Yes	122.70±14.37	t = -0.437	0.663
	No	124.17±16.45		
Music Listening	Yes	124.16±16.25	t = 0.842	0.401
	No	119.25±13.68		
BF/GF Relationship	Yes	127.48±11.51	t = 2.044	0.042
	No	122.45±17.62		
Expulsion History	Yes	119.73±6.51	t = -0.895	0.372
	No	124.21±16.52		
Internet Use	< 2 hrs	123.62±13.82	t = -0.207	0.836
	≥ 2 hrs	124.13±17.16		
Sleep Duration	< 6 hrs	101.67±3.39	F = 6.454	0.002
	6–8 hrs	124.40±16.08		
	> 8 hrs	127.05±14.43		
Batch	1	119.81±17.34	F = 6.198	0.000
	2	129.32±19.36		
	3	119.76±14.63		
	4	129.26±9.16		

(SD = 14.56) (t = 2.58, p = 0.011). This result aligns with prior research suggesting that males are more likely to exhibit overt aggressive tendencies.

Sleep duration showed a highly significant association with aggression (F = 6.45, p = 0.002). Students sleeping less than 6 hours (n = 6) had the lowest aggression score (M = 101.67, SD = 3.39), whereas those sleeping 6–8 hours (n = 177) reported a mean of 124.40 (SD = 16.08). Surprisingly, students sleeping more than 8 hours (n = 19) had an even higher mean score of 127.05 (SD = 14.43). These findings suggest that both insufficient and excessive sleep may reflect or contribute to emotional dysregulation, potentially influencing aggression.

Relationship status also had a significant impact. Participants reporting a current boyfriend/girlfriend relationship (n = 61) had a mean aggression score of 127.48 (SD = 11.51), significantly higher than those not in a relationship (n = 141), who scored 122.45 (SD = 17.62) (t = 2.04, p = 0.042). The presence of a relationship may intensify emotional arousal, interpersonal conflicts, or stress, contributing to elevated aggression.

Academic year, categorized as Batch 1 through Batch 4, revealed statistically significant differences (F = 6.20, p<0.001). Students in Batch 2 (2nd year) and Batch 4 (4th year) showed the highest aggression scores (M = 129.32, SD = 19.36 and M = 129.26, SD = 9.16, respectively). Conversely, students in Batch 1 (1st year) and Batch 3 (3rd year) reported lower aggression (M = 119.81 and 119.76, respectively).

This trend could be linked to transitional academic pressure (Batch 2) and professional stress (Batch 4).

Several lifestyle and background variables, although not statistically significant, offer insight into aggression patterns. For example, students from joint families (n = 62) had a higher aggression mean (M = 126.58, SD = 16.96) compared to those from nuclear families (n = 140, M = 122.81, SD = 15.71), but this difference was not statistically significant (p = 0.127). This may reflect differing dynamics in social support or conflict within household structures.

Alcohol use showed minimal impact on aggression scores. Those reporting alcohol use (n = 29) had a mean aggression score of 123.41 (SD = 13.91), almost identical to those who did not consume alcohol (n = 173; M = 124.06, SD = 16.54), and the difference was not significant (p = 0.842). Similarly, smokers (n = 25) had a slightly higher aggression score (M = 125.72) than non-smokers (n = 177; M = 123.72), but this difference also lacked statistical significance (p = 0.564).

Students who exercised regularly (n = 39) had a slightly higher mean score (M = 125.18, SD = 16.73) compared to non-exercisers (n = 163; M = 123.68, SD = 16.06), but this was not statistically meaningful (p = 0.604). Meditation, commonly assumed to buffer emotional reactivity, did not show a measurable impact either: students who meditated (n = 27) had an aggression mean of 122.70 (SD = 14.37), marginally lower than non-meditators (n = 175; M = 124.17, SD = 16.45), with no significant difference (p = 0.663).

Lastly, music listening habits, nearly universal in this cohort, had no significant influence on aggression. The small

Table 3: Descriptive Statistics for AQ Subscales

Subscale	Mean	SD	Min	Max
Physical Aggression	25.10	5.63	13.0	42.0
Verbal Aggression	16.22	3.48	8.0	23.0
Anger	21.23	5.08	9.0	33.0
Hostility	24.43	4.61	12.0	32.0
Total AQ Score	86.98	14.84	50.0	120.0

group of students who did not listen to music (n = 8) reported a lower mean score (M = 119.25, SD = 13.68) compared to music listeners (n = 194; M = 124.16, SD = 16.25), but this difference was not statistically significant (p = 0.401).

Descriptive analysis of the Buss and Perry Aggression Questionnaire revealed that the highest mean subscale score was in Hostility (M = 24.43, SD = 4.61), closely followed by Physical Aggression (M = 25.10, SD = 5.63) and Anger (M = 21.23, SD = 5.08). Verbal Aggression had the lowest mean (M = 16.22, SD = 3.48). The overall Total Aggression Score averaged 86.98 (SD = 14.84), with individual scores ranging from 50 to 120. This distribution indicates moderate-to-high variability in aggression traits among the medical student population, with cognitive (hostility) and physical components of aggression being more prominent than verbal expressions.

DISCUSSION

The present study aimed to assess aggression levels among undergraduate medical students at Indira Gandhi Medical College, Shimla, using the Buss and Perry Aggression Questionnaire, and to explore how various demographic, behavioral, and psychosocial variables influence aggressive tendencies. The findings provide important insights into how aggression manifests within a high-pressure academic and clinical training environment.

The data revealed that male students exhibited significantly higher total aggression scores than female students. This finding is consistent with existing literature suggesting that males are more prone to externalizing aggressive behaviors, such as physical and verbal aggression, likely due to both biological and sociocultural influences. While females may be more inclined toward internalizing stress and emotional dysregulation, males often channel such tendencies through outward aggression, especially in competitive academic settings like medical colleges.

One of the most striking findings was the association between sleep duration and aggression. Students who reported sleeping less than 6 hours per night had the lowest aggression scores, while those who slept between 6–8 hours and more than 8 hours had significantly higher aggression levels. While this might appear counterintuitive, it suggests that individuals experiencing emotional or interpersonal dysregulation (which could elevate aggression) may be sleeping more as a coping or escape mechanism. Conversely, very short sleep may reflect high academic engagement or burnout, which paradoxically may suppress outward aggression due to emotional exhaustion.

Students involved in a romantic relationship had significantly higher aggression scores. Romantic relationships during medical training can be both a source of support and a stressor, potentially leading to emotional volatility, interpersonal conflict, or distraction from academic responsibilities. This aligns with studies showing that emotionally charged interpersonal contexts often heighten anger, frustration, and reactive aggression [5,6,8,12].

A clear pattern emerged with respect to academic year. Second-year and final-year (Batch 2 and Batch 4) students had the highest aggression scores, while first-year and third-year students had significantly lower levels. This trend may reflect the transitional stress of adapting to clinical exposure (in second year) and professional examination pressures (in final year), both of which are known stressors in medical education. These findings underscore the importance of year-specific psychological support and stress-management interventions in medical curricula.

Although variables such as type of family, alcohol and smoking habits, exercise, meditation, and music listening did not show statistically significant differences in aggression, their trends provide valuable context. For instance, joint-family students had marginally higher aggression scores than those from nuclear families, potentially reflecting complex family dynamics or reduced autonomy. Smokers and alcohol users also showed slightly elevated aggression, which while not significant in this sample aligns with broader psychological literature linking substance use with impaired emotion regulation [5,6,8].

Regular exercise and meditation, while theoretically expected to buffer aggression, did not significantly alter scores in this study. This could be due to variability in frequency, quality, or consistency of these practices. Interestingly, students who did not listen to music had slightly lower aggression, although the sample size in this group was very small, limiting interpretation.

CONCLUSION

This study explored aggression levels among MBBS students at Indira Gandhi Medical College, Shimla, using the Buss and Perry Aggression Questionnaire and examined its association with a range of demographic and behavioral variables. The findings revealed that male gender, romantic relationship involvement, and specific academic years (2nd and 4th year) were significantly associated with higher aggression scores. Additionally, sleep duration showed a complex, nonlinear relationship with aggression, indicating that both insufficient and excessive sleep may be markers of psychological distress or poor emotional regulation.

While other variables such as type of family, alcohol or smoking status, exercise, meditation, and music listening did not reach statistical significance, they offer valuable context into the psychosocial environment in which aggression develops. These findings highlight the need for early identification, tailored interventions, and year-specific

psychological support within medical colleges to mitigate aggression and improve emotional well-being in future healthcare professionals.

Recommendations

Based on the findings of this study, the following recommendations are proposed:

- **Gender-Sensitive Counseling:** Develop male-oriented psychoeducational programs that help students understand and regulate aggressive impulses.
- **Sleep Hygiene Education:** Encourage balanced sleep routines and address both sleep deprivation and oversleeping as potential indicators of stress.
- **Relationship Counseling:** Offer relationship guidance services to help students navigate interpersonal conflicts that may fuel aggression.
- **Stress Management Workshops:** Conduct year-wise training sessions focused on mindfulness, time management, and emotion regulation, particularly for 2nd and 4th-year students.
- **Routine Screening:** Incorporate periodic psychological screening, including aggression assessments, into student wellness programs.
- **Peer Support Networks:** Foster safe peer-sharing platforms where students can discuss academic and emotional struggles without judgment.

Strengths of the Study

- The study includes a representative sample across all four years of medical education, allowing for meaningful year-wise comparisons.
- It uses a validated and widely accepted psychometric tool (Buss & Perry Aggression Questionnaire), ensuring reliability in measurement.
- The online data collection format allowed for anonymous, wide-reaching participation, which may have encouraged more honest responses.
- The study explores not only aggression scores but also contextualizes them with lifestyle and behavioral factors, offering a holistic view of aggression in the medical student population.

Limitations

Despite its contributions, this study has several limitations:

- Cross-sectional design limits causal inference; longitudinal studies are needed to examine changes over time.
- Self-reported data may be subject to social desirability and recall bias.
- The sample was drawn from a single medical institution, which may limit generalizability to broader populations.
- Lifestyle variables such as exercise, meditation, and sleep were assessed categorically without detailed frequency or duration metrics.
- Some groups (e.g., non-music listeners, <6-hour sleepers) had small sample sizes, reducing statistical power.

Future research should address these limitations by employing larger, multicenter designs with more granular lifestyle assessments and integrating qualitative components to explore the context of aggression more deeply.

Ethical Considerations

Participation was voluntary, and informed consent was obtained digitally via Google Form before submission. Participant anonymity and data confidentiality were strictly maintained throughout the study.

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Conflict of Interest

The authors declare no conflict of interest related to the conduct, analysis, or publication of this research.

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