RESEARCH ARTICLE

Social anxiety and resilience among undergraduate medical students in Kolkata: A mixed-methods study

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ABSTRACT

Background: Social anxiety disorder, or social phobia, involves an uncontrollable fear of social situations, exacerbating stress and hindering academic performance. Building resilience is crucial as it helps individuals cope with and recover from stress effectively. This study aimed to assess social anxiety and resilience among undergraduate medical students at a tertiary care institute in Kolkata and to identify any associated sociodemographic factors.

Methods: A mixed-methods study was conducted from April to June 2022 among 200 undergraduate medical students of Phase-I of Bachelor of Medicine, Bachelor of Surgery. Quantitative data were collected via electronic method (Google Forms). Multinomial logistic regression was performed to examine relation between sociodemographic characteristics, social anxiety, and resilience. The qualitative component consisted of in-depth interviews with 12 purposively selected participants and was thematically analysed.

Results: Most (80.0%) participants were aged between 17 and 20 years, and 63.7% were from urban residences. Social anxiety was prevalent in almost 78% of participants, while only 2.1% exhibited 'high' resilience. Students whose mothers had received primary education and less monthly pocket money had significantly higher odds of experiencing social anxiety. Qualitative findings revealed themes such as fear of judgment, avoidance of social situations, and impacts on academic performance, with coping mechanisms including seeking social support and practicing mindfulness.

Conclusion: Most of the participants experienced social anxiety, with few displaying high resilience. These findings highlight the need for comprehensive mental health support systems within medical institutions.

INTRODUCTION

Social anxiety disorder (SAD), also called social phobia, is an uncontrollable fear of social situations, which involves fear of observation or making contact with strangers. Therefore, helping individuals with social anxiety, can significantly influence their mental health and prevent other problems.[1] SAD is also defined according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) as an extreme fear or anxiety about one or more social situations in which the individual is exposed to scrutiny by others, for instance, social interactions, being observed, and performing in front of others.[1]

HIGHLIGHTS

1. Phase-I MBBS students were involved as study participants as it is the formative and decisive year for the development of any social anxiety and its related coping mechanisms among them.

2. The study utilised a cross-sectional, mixed-methods design to better understand the students' experiences.

3. It is apparent that socioeconomic factors are associated with social anxiety among medical students.

The age of onset of SAD is around 15 years, with the prevalence being between 4.0% and 8.7% among those aged 14 – 24 years. Young people are specially vulnerable to SAD.[2] Social anxiety negatively impact academic and professional achievement, quality of life and social relationships, and predisposed to substance abuse and depression. Studies found that the lifetime prevalence of SAD is reported to be 13.3%.[3]

People with SAD have deficient self cognition and a tendency to criticise their own social abilities. They suffer from appearance anxiety that refers to individuals who pay excessive attention to their appearance due to perceived social standards and perceptions of other people's evaluations, which consequently generate insecurity, doubt, and anxiety about their appearance.[4]

Individuals with SAD tend to rate themselves more negatively than controls in a variety of areas, including social skills, physical appearance, and signs of anxiety. They also believe that it would be undesirable for them to violate social norms, as others would identify their flaws.[5]

Undergraduate medical students often do not seek help for their mental health concerns. The rates of anxiety, depression and burnout in them are expected to be high, with the majority not seeking treatment for their psychological distress. Perceptions of stigma are hypothesised to be a potential source of this lack of care-seeking behaviour. Resilience helps the students handle challenges, such as changing learning styles and experiencing their first clinical practice.[6]

The competitive nature of medical education in India, combined with the societal expectations placed on medical students, can heighten stress levels and exacerbate anxiety disorders. This is seen in the majority of phase-I MBBS students as this is the year when they gradually start getting accustomed to the medical education system. Since there is a dearth of studies regarding these issues in India, the current research focused on exploring social anxiety and resilience among the phase-I undergraduate medical students of a medical college institute in Kolkata to find out any associated sociodemographic characteristics.

METHODS

Design and setting

This was a descriptive observational study with a mixed-method design that employed a quantitative dominant convergent parallel design (QUAN + qual). The study was conducted at the Institute of Post Graduate Medical Education and Research (IPGME&R) and Seth Sukhlal Karnani Memorial (SSKM) Hospital in Kolkata, West Bengal, India.

Participants

The study was conducted over three months (April to June 2022) and included all 200 medical students in phase-I of the MBBS curriculum at IPGME&R and SSKM Hospital. Phase I was selected as it represents the orientation phase of the undergraduate medical course, making it an ideal period to assess students' stress, anxiety, resilience, adjustments, and coping mechanisms during their formative years. The students present for their lecture classes or practical sessions during the entire data collection period were included. The students who were already diagnosed with some mental health disorder and those who did not give informed written consent to participate were excluded from participation.

Sample and sampling

For the quantitative part, eligible study subjects were selected using the complete enumeration method to achieve the desired sample size of 200 during the academic year 2022-2023. However, the final sample size (n) at the end of the data collection period was 190. For the qualitative strand, participants were selected from those willing to share their experiences in depth. The final sample size was 12 (denoted as n1).

Ascertainment of key variables

A predesigned, pretested, and structured electronic questionnaire (Google Forms) was employed to collect data. This self-administered questionnaire, developed in English, contained a mixture of open-ended and closed questions, as all the participants were well-versed in English. Two validated scales were used to assess social interaction, anxiety, and resilience among the participants: the Social Interaction Anxiety Scale (SIAS) [7] and the Brief Resilience Scale.[8] After preparation by the authors, the questionnaire was validated for its content by three faculty members, one each from the Departments of Community Medicine, Psychiatry, and the Medical Education Unit of the institution. Necessary changes were incorporated based on their feedback before pretesting the questionnaire.

The questionnaire was administered to students who attended clinical postings or lecture classes at the end of the sessions. Absentees were contacted by phone and asked to come the following day. Up to three phone calls were made to each absentee. Those who did not respond or were absent throughout the data collection period were excluded from the study. Thus, for the quantitative part, the final sample size at the end of the data collection period turned out to be 190.

Social anxiety was assessed using the 'Social Interaction Anxiety Scale' (SIAS),[7] a validated 5-point Likert scale consisting of 20 items with options ranging from 'not at all' to 'extremely', with a total score range of 0–80. Social interaction and anxiety were calculated by adding scores assigned to each item to obtain the total score. The Brief Resilience Scale8 is a validated 5-point Likert Scale containing six items with options ranging from "strongly disagree" to "strongly agree". The total score range was 6 – 30. Resilience was calculated by adding the responses for all six items and dividing the total sum by the total number of questions answered.

Qualitative data

For the qualitative strand, participants were selected using the convenience sampling technique, following a thorough explanation of the procedures and rationale for conducting the study, including voluntary participation. Twelve students (n_1) were selected for in-depth interviews (IDIs) to gain deeper insights into their experiences and coping mechanisms related to social anxiety and resilience. Interviews were conducted using a pre-tested, semi-structured interview guide. Informed consent to audio records of the sessions was obtained from all participants before the interviews, lasting between 20-30 minutes, ensuring that the IDIs were accurately captured for thorough analysis. The authors provided no prior training before instituting the IDIs. Care was taken to maintain the anonymity of the participants, including data confidentiality.

Statistical analysis

Data were tabulated in Microsoft Office Excel 2021 and analysed using the SPSS version 25.0. Descriptive statistics were represented using mean (standard deviation), frequency, and percent with the help of suitable diagrams.

A score of 36 or higher suggested a possible diagnosis of social anxiety and was categorised as 'having social anxiety'. Those students who scored within the 50th percentile were categorised as having 'low resilience'. In contrast, those who scored between the 50th-75th percentile were classified as having 'moderate resilience', and those who scored >75th percentile were categorised as having 'high resilience' to social anxiety. The association of social anxiety and resilience (mild, moderate, and severe) with sociodemographic characteristics of the students was examined using the chi-square test. Regression was performed to assess the relationship between the sociodemographic characteristics of the study subjects and their social anxiety to obtain odds ratios and their 95% confidence intervals (CIs). All the variables having a $P<0.2$ in the univariate logistic regression were considered biologically plausible and included in the multivariable model to check for model fitness, after checking for multi-co-linearity (variance inflation factor >10 and tolerance <0.1). $P<0.05$ was considered statistically significant.

A thematic analysis was performed on the data obtained from IDIs. The qualitative data were first transcribed, translated, and expressed as verbatims. From the transcription, codes were developed. Similar codes were combined into categories from which themes were developed. The quantitative and qualitative strands were integrated into the final analysis. Data triangulation was done at the analysis and interpretation levels.

Ethical considerations

The ethical clearance to conduct the study was obtained from the Institutional Ethics Committee (IEC) of IPGME&R and SSKM Hospital, Kolkata. Informed written consent was taken from the study participants. Anonymity and confidentiality of the data were maintained throughout the study.

RESULTS

The mean age of the study participants was 19.6 years (standard deviation, 1.2 years). Eighty per cent were aged 17–20 years, 78.4% were male, and 63.7% were from urban areas. More than half (59.4%) had English as the medium of instruction in their respective schools. More than half of their parents had graduation or higher education. Most of their fathers were employed (83.2%), while nearly 82.6% of mothers were homemakers. Almost 60% received pocket money of >1,000 INR per month **(TABLE 1)**.

Among the participants, 78.4% had reported social anxiety, while the remaining (22%) did not report having the same. Only 4 (2%) of the study subjects had 'high' resilience to social anxiety, 35% had 'low' resilience, and most (63%) had 'moderate' resilience. Moderate resilience is the most prevalent level of resilience across both groups (with or without social anxiety). Low resilience is more common in the group with social anxiety (50 respondents). High resilience is rare in both groups but is slightly more represented in the group with social anxiety (4 individuals). This chart indicates that while many respondents with social anxiety have moderate resilience, there is a noticeable group struggling with low resilience **(FIGURE 1)**.

TABLE 1 Socio-demographic characteristics of the study participants (n=200)

Socio-demographic Characteristics	Number (%)
Education of father	
Up to primary	9 (4.7)
Middle school	17 (8.9)
Secondary	18 (9.5)
Higher secondary	8 (4.2)
Graduation or higher	138 (72.6)
Education of mother	
Up to primary	7 (4.2)
Middle school	34 (17.9)
Secondary	32 (16.8)
Higher secondary	17 (10.5)
Graduation or higher	96 (50.5)
Occupation of father	
Professional	25 (13.2)
Retired	158 (83.2)
Others	7 (3.7)
Occupation of mother	
Homemaker	157 (82.6)
Teacher	16 (8.4)
Others	17 (8.9)
Pocket money per month (INR)	
≤500	58 (24.1)
501-1000	37 (15.4)
≥1001	146 (60.5)
Mother tongue	
Bengali	152 (80.0)
Hindi	32 (16.8)
Others	6 (3.2)
Number of siblings of study participants	
None	103 (54.2)
≥1	87 (45.8)

Multivariable binary logistic regression showed that the students who had English as the medium of instruction in their schools and who had no siblings had statistically significantly lower odds of social anxiety compared to the reference group (aOR 0.9; 95% CI 0.4–2.1) and (aOR 0.4; 95% CI 0.2–0.9). Students whose mothers had received primary education and less monthly pocket money had higher odds of experiencing social anxiety, which was statistically significant. (aOR 2.7; 95% CI 0.4–17.1), (aOR 1.1; 95% CI 0.2–1.2) **(TABLE 2)**.

The thematic analysis highlights that social anxiety among medical students is influenced by the fear of judgment, physical symptoms, and academic performance impacts. Coping mechanisms primarily involve seeking social support and sometimes resorting to avoidance. The presence of supportive peers plays a
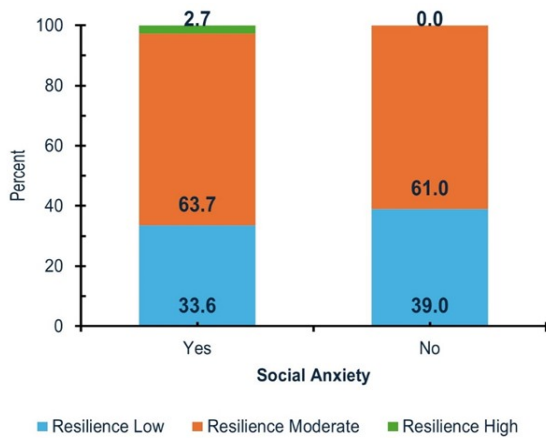
FIGURE 1 Distribution of study participants by resilience under each category of social anxiety (n=190)

crucial role in mitigating anxiety. Additionally, socio-economic factors exacerbate stress levels, underscoring the importance of addressing financial concerns as part of mental health support **(TABLE 3)**.

TABLE 2 Relationship of sociodemographic characteristics of the study participants with social anxiety (n=190)

Sociodemographic Characteristics	Total, number	Social anxiety 'present' number	aOR (95% confidence interval)	P
Education of father				
Up to primary	9	5	1.7 (0.3 – 8.9)	0.50
Higher secondary	43	34	1.0 (0.3 – 2.7)	0.92
Graduates and above	138	110	Ref.	
Education of mother				
Up to primary	8	4	2.7 (0.4 – 17.1)	0.03
Higher secondary	86	67	1.0 (0.4 – 2.5)	0.97
Graduates and above	96	78	Ref.	
Medium of instruction in school				
English	116	94	0.9 (0.42 – 2.1)	0.04
Others (Bengali, Hindi, etc.)	74	55	Ref.	
Pocket money per month, INR				
≤500	58	41	1.12 (0.2 – 1.2)	0.02
501 to 1000	37	23	0.83 (0.3 – 2.3)	0.72
≥1001 and above	146	85	Ref.	
Number of siblings				
None	103	87	0.5 (0.2 – 0.9)	0.03
≥ 1	87	62	Ref.	

aOR indicates adjusted odds ratio; Ref., reference category.

The juxtaposed findings from the quantitative and qualitative strands provide a robust and comprehensive understanding of social anxiety and resilience among medical students. The convergence of data across domains highlights key areas of concern, such as the high prevalence of social anxiety, its impact on academic performance, and the critical role of socio-demographic factors and coping strategies **(TABLE 4)**.

TABLE 3 Thematic analysis of in-depth interviews (IDIs) of the study participants (n_1=12)

Verbatims from IDIs	Codes	Themes
"......... I constantly feel like everyone is watching and judging me."	Fear of judgment	Experiences of social anxiety
"....... I avoid speaking in class or participating in group activities because I'm afraid of embarrassing myself."	Avoidance of social situations	
"........... whenever I have to present something, my heart races, and I start sweating profusely."	Physical symptoms of anxiety	
"........ my anxiety makes it hard to focus during lectures and study sessions. I know I'm capable, but the anxiety holds me back."	Impact on academic performance	
"....... talking to my friends and family helps a lot. They understand and offer support when I'm feeling overwhelmed."	Seeking social support	Coping mechanisms
"........... sometimes, I just isolate myself to avoid any potential anxiety triggers."	Avoidance and withdrawal	
"........ having supportive classmates makes a big difference. We often study together and help each other out."	Peer support	Support systems
"....... coming from a middle-income family, I worry a lot about the financial burden of my education, which adds to my stress."	Socio-economic status	Impact of socio-demographic factors

DISCUSSION

The current study was an observational study with a mixed-methods design. It was carried out among 200 Phase I MBBS students of a medical college in Kolkata, using a complete enumeration method. Data was collected using an electronic questionnaire for the quantitative part along with IDIs for the qualitative strand to the participants.

In a study conducted by Shao R *et al.*,[9] the prevalence of depression and anxiety symptoms among medical students was 57.5 and 30.8%, respectively, and older students (≥20 years) experienced higher levels of depression and anxiety. Whereas in this study, the overall prevalence of anxiety was 80.0% among undergraduate medical students.

TABLE 4 Juxtaposed findings from quantitative and qualitative strand

Domain	Quantitative	Qualitative	Convergence	Inference
Proportion and personal experiences	High proportion of social anxiety (78.4%)	fear of judgment and avoidance behaviors	Confirmed	High social anxiety confirmed by fear and avoidance behaviors
Coping strategies and resilience	Nothing significant	seeking social support	Not confirmed	Social support as a key coping strategy
Impact on academic performance	detrimental impact of social anxiety	anxiety affected concentration and participation	Confirmed	Social anxiety negatively affects academics; confirmed by concentration and participation issues
Socio-demographic influences	Mother tongue, No. of siblings are the factors associated with social anxiety	pressures related to gender expectations and financial stress	Not confirmed	Gender and economic factors impact resilience

According to a study conducted by Sreeramareddy CT *et al.*,[10] in Nepal, the most common sources of stress among undergraduate medical students were related to academic and psychosocial concerns, while the most important and severe sources of stress were staying in the hostel, high parental expectations, the vastness of syllabus, exams, lack of time and facilities for entertainment. Our study revealed that subjects whose mothers had received primary education and less monthly pocket money had significantly higher odds of experiencing social anxiety than those whose mothers had completed higher educations and those who had more monthly allotted pocket money. From this, we can assume that the education of mothers plays a significant role in contributing to social anxiety among their children.

The current study revealed that nearly 80.0% of the first-year undergraduate medical students suffered from social anxiety, and only 2.1% had high resilience to stress and anxiety. Similarly, in a study conducted by Heinen I *et al.*,[11] which also included first year medical students, reported higher levels of perceived stress and higher levels of anxiety and depression than reference samples.

A study was done by Iqbal S *et al.*,[12] in Bhubaneswar, Odisha (India), among undergraduate medical students, which showed that more than half of the study subjects were affected by depression (51.3%), anxiety (66.9%) and stress (53%) while morbidity was found to be more in 5th semester students rather than students of 2nd semester. Females reported higher scores than their male counterparts. However, the present study, conducted only among 1st year (Phase-I) undergraduate medical students, took into account only social anxiety and resilience. In this study, the majority of study participants (80.0%) reported social anxiety. In comparison, very low (only 6%) were resilient to stress or other uncomfortable adjustments, and there was a statistically significant association of resilience with the gender and monthly pocket money of the students.

According to a study conducted by Nimkuntod P *et al.*,[13] in Thailand, which included 230 undergraduate medical students from first year to final year, where 43.2% were male students, it was found that the prevalence of mild to moderate degree of anxiety was 22.5% and used the DASS-1 questionnaire. On the contrary, in the present study, which included 190 undergraduate medical students in only the first year, the majority were males (78.4%). The social anxiety was assessed using SIAS, which revealed that most of the students had social anxiety (80.0%).

In a study conducted by Teh BLS *et al.*,[14] in Malaysia during the COVID-19 pandemic, 371 respondents from a tertiary education centre were recruited. The overall prevalence of anxiety in the study was 37%, and sociodemographic factors such as age group and academic year were significantly associated with anxiety. However, in the present study, which recruited 190 undergraduate medical students from a Tertiary Care teaching institute, the overall prevalence of anxiety was 80.0%, which is much more than the above-mentioned study. Also, sociodemographic characteristics such as the age of the students, mother tongue, number of siblings, father's education and caste had a statistically significant association with their social anxiety. The current study also aimed to find out the resilience among the students, and it was revealed that only 2% had high resilience, which also had

statistically significant associations with the student's gender and religion and allotted pocket money per month.

The present study mainly focussed on assessing social anxiety and resilience among first-year undergraduate medical students, which recruited 190 students. It revealed that the prevalence of anxiety was 78.4%, while only 2% had high resilience, 66% moderate, and 32% had low resilience. On the contrary, in a study by Ghoghare AS *et al.*,[15] which recruited 381 health sciences students and was conducted online, the prevalence of anxiety was 6.3%. In the same study, 1.3% of participants had high resilience, 56.7% had normal resilience, and 42.0% had low resilience. If we compare both these studies, the majority had normal or moderate resilience while very few had high resilience.

According to a study conducted by Golui P *et al.*,[16] during the COVID-19 pandemic among medical students, it was revealed that one-fourth (25.2%) of the participants had low-level resilience, in contrast to the present study, which showed 32% of undergraduate medical students had low resilience. In a study conducted by Mohammed EH *et al.*,[17] the prevalence of severe stress and low resilience among Egyptian medical students was assessed. The study found that 48.9% of the students experienced severe stress, while 49.9% had low resilience. Several factors were significantly associated with higher levels of stress and lower resilience. Female students, those living alone, those spending long hours on social media, and those contemplating suicide or considering leaving the medical field were more likely to experience severe stress and low resilience.

Strengths and Limitations

The current study is novel because it focuses on assessing the social anxiety and resilience factors, including the coping mechanisms of undergraduate medical students during their formative years. Much research has not been conducted on this aspect. However, the study included only the Phase I undergraduate medical students. Moreover, it relied upon self-reported data, which may be subject to social desirability bias.

Conclusion

The findings from this study highlight the need for early detection and management of cases of social anxiety. Evaluation of the educational environment and the types of teaching curriculum in medical colleges is necessary to optimise the students' learning experiences and maintain their psychological well-being, along with enhancing the primary healthcare providers and mental healthcare professionals for early case detection and management.

Author contributions

Conception Conception and design: SKS, PPP, NB, MB, SP, PK. *Acquisition, analysis, and interpretation of data:* SKS, PPP, NB, MB, SP, PK. *Manuscript drafting and revising it critically:* SKS, PPP, NB, MB, SP, PK. *Approval of the final version of the manuscript:* SKS, PPP, NB, MB, SP, PK. *Guarantor of accuracy and integrity of the work:* SKS, PPP, NB, MB, SP, PK.

Conflict of interest

We do not have any conflict of interest.

Ethical approval

The ethical approval for this study was obtained from the Institutional Ethics Committee (IEC) of IPGME&R and SSKM Hospital, Kolkata (IPGME&R/IEC/2022/244, dated xxxxx).

Data availability statement

We confirm that the data supporting the findings of the study will be shared upon reasonable request.

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