Prevalence and correlates of depression, anxiety, and stress among high school students in a block of Hooghly district, West Bengal: Across-sectional study

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Abstract:

BACKGROUND: Adolescent mental health is a concern. A high magnitude of deranged mental health conditions among adolescents is prevailing, which often gets extended into adulthood too. Hence, assessment of mental health morbidities like depression, anxiety, and stress is crucial to address them. This study aimed to estimate the prevalence of depression, anxiety, and stress among school-going adolescents studying in classes IX–XII and find out its correlates among the subjects.

MATERIALS AND METHODS: This cross-sectional study was conducted among 812 adolescents studying in classes IX–XII in four randomly selected schools of Haripal block of Hooghly district, West Bengal, in 2022. A complete enumeration of students in each class of the selected schools was done. Data were collected by using a pretested schedule that included standardized depression, anxiety, and stress scale (DASS-21). Descriptive statistics and a Chi-square test were applied. Regression analysis was doneto determine associations and compute the adjusted odds ratio. Data were analyzed using SPSS version 23.

RESULTS: Overall prevalence of depression, anxiety, and stress were found to be 52.3%, 47.4%, and 33.7% respectively. Subscale scores shows 16.1% and 10.8% suffered from extremely severe depression and anxiety, respectively. It was noted that these were more common among female students, the late adolescent age group (16–19 years), students having social problems in the family, and those reporting using substances.

CONCLUSION: The prevalence of depression, anxiety, and stress being high among school students indicates a significant burden of mental health disease. Effective strategies to alleviate the adverse mental health, along with early identification of disease, can help in along way.

Keywords:

Adolescent, anxiety, depression, India, stress

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Introduction

Adolescence is the phase of life between childhood and adulthood, from ages 10 to 19. It is a unique stage of human development and an important time tolay the foundations of good health.[1] It is a unique and formative time. Physical, emotional, and social changes, including exposure to poverty, abuse, or violence, can make adolescents vulnerable to mental health problems. Protecting adolescents from adversity, promoting psychological well-being, and ensuring access to mental health care are critical for health and well-being during adolescence and productive adulthood.

The physical, psychological, and behavioral changes taking place during adolescence contribute to many mental health problems.[2] Globally, it is estimated that 1 in 7 (14%) 10–19 year-olds experience mental health conditions,[3] yet these remain largely unrecognized and untreated. Depression, anxiety, and stress are recognized as common, serious mental health issues for the adolescent age group. Adolescents with mental health conditions are particularly vulnerable to social exclusion, discrimination, stigma (affecting readiness to seek help), educational difficulties, risk-taking behaviours, physical ill-health, and human rights violations. Anxiety disorders (which may involve panic or excessive worry) are the most prevalent in this age group and are more common among older than among younger adolescents. It is estimated that 3.6% of 10–14 yearold and 4.6% of 15–19 yearolds experience an anxiety disorder. Depression is estimated to occur among 1.1% of adolescents aged 10–14 years and 2.8% of 15–19 yearolds.[1] In India, psychiatric disorders among adolescents arearound 7.3%.[4] Depression and anxiety share some of the same symptoms, including rapid and unexpected changes in mood. Anxiety and depressive disorders can profoundly affect school attendance and schoolwork. Social withdrawal can exacerbate isolation and loneliness. Depression can lead to suicide.[1]

Several studies[5-7] done in India and abroad found that these disorders, which begin with symptoms in childhood and adolescence, later manifest in adulthood. Some of the major determinants include late adolescence period, unhealthy lifestyle, early or forced marriage, addiction, low self-esteem, peer pressure, familial conflict, exposure to poverty, and a lack of a supportive environment.[8,9] These morbidities largely remain unrecognized and untreated during the developing years, which makes adolescents vulnerable to risk-taking behaviors, discrimination, social exclusion, and face educational difficulties.

In the above scenario, after a careful literature search, evidence regarding mental health morbidities of adolescents in the Hooghly district of West Bengal, India, was unavailable. To bridge the evidence gap, this study was planned to estimate the prevalence of depression, anxiety, and stress among the study subjects and find out the association (if any) between depression, anxiety, stress, and socio-demographic factors of the study subjects.

Materials and Methods

Study design and setting

This cross-sectional study was conducted from June to July 2022 among students studying in 9–12 grades, in Haripal block of Hooghly district, West Bengal, India. There are total 18 Government sponsored higher secondary schools in Haripal block.[10] This study was done in selected schools of the block.

Study participant and sampling

Adolescents studying in classes 9,10,11, and 12 were the study participants. Out of the total list of 18 schools, 20% of the schools, that is, 4 schools were selected by simple random sampling. All students studying in classes 9, 10, 11, and 12 and not exceeding 19 years of age were included in the study. Students having history of psychiatric illness or currently under antipsychotic medication and those absent on the day of data collection were excluded. The minimum sample size was calculated based on a previously conducted study[11] in Chandigarh, India, using a similar instrument on students in classes 9–12. Thus, considering 47.02% prevalence of stress, 95% confidence level, and an absolute precision of 5%, the minimum required sample size for this study is calculated as follows:

$$n = [(Z_{1-\alpha/2})^2 * P * (1-P)] / d^2$$

$$= [(1.96)^2 * 0.47 * 0.53] / (0.05)^2 = 382.6$$

Applying a design effect of 2 due to multistage sampling, the sample size becomes 383 * 2 = 765.2 ~ 766

Adding a 5% non-response rate, the final sample size becomes 766 + 38 = 804.

A complete enumeration of all the students studying in classes 9,10,11, and 12in these schools and who met the eligibility criteria were included in the study.

Data collection tools and techniques

A pre-designed, pre-tested, semi-structured questionnaire for data collection was developed based on the study variables consisting of two parts. The first part had questions related to socio-demographic profile of the study subjects. This included class, age, gender, religion, caste, marital status, type of family, number of siblings, total no.of family members, father's and mother's educational level, monthly family income, substance use, and social problem in family. The second part consisted of standardized depression, anxiety, and stress scale (DASS). This is a psychological screening instrument capable of differentiating symptoms of DAS. The scale contains 21 items and was developed by Lovibond and Lovibond, which is a modified shorter version of DASS-42 questionnaire.[12] It is a set of three self-report scales thatmeasures the emotional states of depression, anxiety, and stress simultaneously and can be used in a non-clinical setting. Each of the three components of the DASS-21 scale contains 7 items.

The depression scale assesses dysphoria hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia, and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The stress scale is sensitive to levels of chronic non-specific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/over-reactive, and impatient. Respondents are asked to use the 4-point severity/frequency scales (as 0 – never, 1 – some times, 2 – often, and 3 – always) to rate the extent to which they have experienced each state over the past week. The final scores for each domain of depression, anxiety, and stress are calculated by multiplying the scores by 2 and summing them up. Cutoffs for the severity of the disease are used as per the available literature.[13] Previously, the validated Bengali version of DASS-21 was used. The questionnaire was pretested on 20 students in a school of the neighboring block. Necessary changes were made accordingly before final data collection.

The questionnaire was self-administered to the participants. Each school was visited once for collecting data. On the day of visit, the purpose of the study was briefed to the students and informed assent was obtained from them. Instructions were given to the students regarding filling up information in questionnaire and timely doubts of the students were clarified. The students were assured of confidentiality of information. Finally, 812 students from all four schools were included in the study.

Data analysis

Collected data were checked for completeness and consistency and entered in the Excel data sheets. Descriptive statistics relating to categorical variables, prevalence of DAS, and severity of them was expressed in absolute number with percentages. For categorical risk factors, bivariate analysis was done to find the significant association between the presence of depression, anxiety, and stress as dependent variables. Factors that came out to be significantly associated ($P < 0.05$) with depression were considered as independent variables for multivariable logistic regression model. After necessary assumptions and model fitting, the adjusted odds ratio with its 95% confidence interval was determined. An alpha level of 5% was considered as the cutoff to be statistically significant. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp. was used for analysis.

Ethical consideration

The study was conducted after getting approval from the Institutional Ethics committee (ethics clearance number BMC/IEC/41). The permission to conduct the study in the schools was taken from the Heads of the schools well ahead of the data collection. School principals were requested to make announcement in school assembly one day ahead about the visit. On the day of visit, the purpose of the study was explained, and verbal assent were obtained. The school teachers actively co-operated during the whole period of the study. Anonymity and confidentiality were assured. An interactive health talk was given covering areas on mental health, adolescent mental health problems, warning signs, and ways to prevent mental ill-health after collecting the responses.

Results

A total of 812 students participated in the study. There were 390 (48%) students from class IX, 90 (11.1%) from class X, 226 (27.8%) from class XI, and rest 106 (13.1%) from class XII. Mean age of the study subjects was 15.41 (SD ± 0.9) years [Table 1].

Overall prevalence of depression, anxiety, and stress was 52.3%, 47.4%, and 33.7%, respectively, among the participants. DASS-21 scores on each subscale shows that 10.8% suffered from very severe depression and 16.1% suffered from very severe anxiety [Table 2].

Statistically significant difference was found in case of depression, anxiety, and stress with age, gender, and substance use. Other factors like familial problem and socioeconomic status were the factors found to be associated with stress only. Rest of the sociodemographic variables, like religion, caste, and type of family, did not reveal any association with depression, anxiety, and stress [Table 3].

Depression was found to be present in more than half of the study subjects. Binary logistic regression was performed to predict the presence of depression from covariates that were found significantly associated with having depression in bivariate analysis. All the factors considered in bivariate analysis having P value < 0.1 were included in the model by the Enter method. On adjusting for all the independent variables, age (AOR = 2.07, 95%CI: 1.55–2.79), gender (AOR = 1.77, 95%CI: 1.32–2.37), and substance use (AOR = 2.04, 95%CI: 1.18–3.51) remained significantly associated for symptoms of depression among adolescent students. The model was found fit (Hosmer–lemenshow test, $P = 0.46$). A total of 9.7% of the variance in the dependent variable (having depression) can be explained by the independent variables in this model (Nagelkerke R2) [Table 4].

Discussion

This cross-sectional study conducted among high school adolescent students studying in classes 9–12 aimed

Table 1: Socio-demographic profile of the study subjects (*n*=812)

Characteristics	Number (%)
Age group (years)	
14–15	460 (56.7)
16–19	353 (43.3)
Gender	
Male	454 (55.9)
Female	358 (44.1)
Religion	
Hindu	739 (91)
Muslim	63 (7.8)
Others	10 (1.2)
Caste	
General	506 (62.3)
SC	111 (13.7)
ST	25 (3.1)
OBC	170 (20.9)
Marital Status	
Unmarried	786 (96.8)
Married	26 (3.2)
Type of family	
Nuclear	439 (54.2)
Joint	373 (45.8)
Sibling(s)	
Present	578 (71.2)
Absent	234 (28.8)
Mothers education (*n*=809)*	
< secondary	469 (57.9%)
≥ secondary	340 (42.1)
Fathers education (*n*=804)*	
< secondary	437 (54.4)
≥ secondary	367 (45.6)
Substance use	
Present	72 (8.6)
Absent	740 (91.4)
Familial problem#	
Yes	67 (17.5)
No	745 (82.5)
Socio-economic status^	
Middle, Upper-middle, Upper	432 (53.2)
Upper lower and Lower	380 (46.8)

*Missing values on account of parents' death. #includes any one of the following social problems: parental separation/death of family member/ addiction in family/relationship issue in the family. ^Based on updated BG Prasad scale [May 2022; CPI (IW):129]

Table 2: Severity of depression, anxiety, and stress among study subjects (*n*=812)

Variable	Depression *n* (%)	Anxiety *n* (%)	Stress *n* (%)
Normal	387 (47.7)	427 (52.6)	538 (66.3)
Mild	132 (31)	99 (25.7)	95 (34.6)
Moderate	171 (40.2)	170 (44.1)	97 (35.4)
Severe	76 (17.8)	54 (14.0)	70 (25.5)
Very severe	46 (10.8)	62 (16.1)	12 (4.3)
Mean score	11.22 (SD±8.8)	7.88 (SD±6.5)	12.64 (SD±8.3)

to find out the prevalenceof depression, anxiety, and stress among the subjects. Out of the three mental health morbidities, this study revealed that depression was more commonly (52.3%) seen among students. Several studies have been done using similar instruments also noted the prevalence of depression to be around 50%.[13,14] One school-based study[15] in the rural area of South India found the prevalence of depression among adolescent students at49% using a different questionnaire. On the contrary, Kumar RK *et al.*[16] and a study[17] conducted in Manipur estimated a lower prevalence of depression, anxiety, and stress among high school students.

In our study, almost one out of two (47.5%) students was found to be suffering from anxiety and stress was present among one-third (33.8%) students. This is a similar finding to a study[18] done by Bhandari and Adhikari in Nepal who reported 46.5% suffering from anxiety. Contrary to this, one study by Deb S *et al.*[19] conducted among schoolchildren from Kolkata found a very high prevalence of anxiety (63.5%). This difference may be due to variable setting in which the study was carried out. Our study was done in a rural setting.

More students in late adolescent period were reported to have DAS compared to the lower age group and the difference was found to be significant on the Chi-square test. One study was doneby Kumar *et al.*[13] in Delhi also had similar findings. Some studies in South India[16,20] noted depression among adolescents increases with age, inline with our study.In our study, it was found that the prevalence of DAS was higher among girls than boys, and the difference was found to be significant (*P* < .05). Comparable observation was shared by Sandal *et al.*[11] in a study conducted in Chandigarhand in studies by Verma *et al.*[21] and another study from Delhi.[13] However, Nagendra *et al.*[14] found depression more prevalent among boys. The use of thedifferent instruments and being a community-based survey could be the probable reason for their difference in findings.

Adolescence is a vulnerable group to experiencingun healthybehavior. In our study, students reporting substance use were found to be suffering from depression, anxiety, and stress compared to those not having no substance use. Similar findings have been reported in other school-based studies in India.[13] Familial issues, parental discord, relationship issues in a familial context, and economic difficulties often create unfavorable circumstances for the students, and these factors have also been explored in our study. Findings reveal a positive association between these factors and DAS. The same is concurred by another study,[22] and a secondary analysis of the US Commonwealth Fund survey on adolescent girls.[23]

Table 3: Factors associated with depression, anxiety, and stress among study participants

Variable	Total (*n*=812)	Depression			Anxiety			Stress		
	n (%)	*n* (%)	χ^2	*P*	*n* (%)	χ^2	*P*	*n* (%)	χ^2	*P*
Age (in years)										
14-15	460 (56.6)	200 (43.5)	32.0	0.00	195 (42.4)	10.7	0.00	118 (25.7)	31.1	0.00
16-19	352 (43.4)	225 (63.9)			190 (54)			156 (44.3)		
Gender										
Male	454 (55.9)	203 (44.7)	25.5	0.00	176 (38.8)	30.1	0.00	114 (25.1)	34.3	0.00
Female	358 (44.1)	222 (62.0)			209 (58.4)			160 (44.7)		
Socio-economic status*										
M, UM, U**	432 (53.2)	214 (49.5)	2.9	0.08	193 (44.7)	2.7	0.09	130 (30.1)	5.5	0.02
UL and L***	380 (46.8)	211 (55.5)			192 (50.5)			144 (37.9)		
Substance use										
Present	71 (8.7)	49 (69)	8.42	0.00	47 (66.2)	11.0	0.00	38 (53.5)	13.6	0.00
Absent	741 (91.3)	376 (50.7)			338 (45.6)			236 (31.8)		
Family problem										
Present	66 (8.1)	42 (63.6)	3.51	0.06	39 (59.1)	3.9	0.05	32 (48.5)	6.9	0.00
Absent	746 (91.9)	383 (51.3)			346 (46.4)			242 (32.4)		

*Based on updated BG Prasad scale [May 2022; CPI (IW):129]. **M=Middle, UM=Upper Middle, U=Upper, ***UL=Upper lower, L=lower

Table 4: Multivariable logistic regression of socio-demographic factors with depression among study subjects

Socio-demographic factors	Total (*n*=812) Number (%)	Depression (*n*=425) Number (%)	AOR (95% CI)	*P*
Age (in completed years)				
14–15	460 (56.6)	200 (43.5)	Ref	0.00
16–19	352 (43.4)	225 (63.9)	2.07 (1.55–2.79)	
Gender				
Male	454 (55.9)	215 (49.8)	Ref	0.00
Female	358 (44.1)	212 (55.8)	1.77 (1.32–2.37)	
Socio-economic status*				
Middle, Upper middle, Upper	432 (53.2)	214 (49.5)	Ref	0.10
Upper lower and Lower	380 (46.8)	211 (55.5)	1.26 (.95–1.69)	
Substance use				
Absent	741 (91.3)	376 (50.7)	Ref	0.01
Present	71 (8.7)	49 (69)	2.04 (1.18–3.51)	
Family problem				
Absent	746 (91.9)	383 (51.3)	Ref	0.27
Present	66 (8.1)	42 (63.6)	1.36 (0.78–2.35)	

CI=Confidence interval, AOR=Adjusted odds ratio. *Based on updated BG Prasad scale [May 2022; CPI (IW):129]. Hosmer and Lemenshow goodness of fit test *P*-value 0.46, Naegelkerke R^2=0.097

Limitation and recommendation

This study had a few limitations. Time and resource constraints limited the study to be conducted in only government-aided schools of a single block of a district. The larger area of the study would have been more appropriate to produce a generalisable result. Efforts were taken to minimize the conscious falsification in answering the socio-demographic questions by students. Further, community-based studies to reveal the various factors, leading to these disorders are recommended.

Conclusion

This study has estimated DAS among adolescents. These mental health issues often go underrecognized during the adolescence period as they tend to hide feelings and become a part of vast change that occurs during this same period. The use of validated questionnaire and adequate sample size are the strengths of this study. Being a school-based study, the effect of including non-school going adolescents remains unknown.

The prevalence of depression, anxiety, and stress being high among school students indicates a significant burden of mental health diseases. As schools hold a large section of the adolescent population, they can be a good opportunity for mental health promotion and prevention. Ensuring mental health and well-being in an adolescent's formative years can foster a better transition from childhood to adulthood.

Conflicts of interest
There are no conflicts of interest.

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