

Determinants of Depression Among Higher Secondary Students of Private Schools of Science Stream in an Urban Area of Western India

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Abstract

Background: Depression, due to its devastating consequences, emerged as the third leading cause of mortality among adolescent school-going children. This necessitates research on determinants of depression among students for effective management. The present study evaluated the various determinants associated with depression among the science students of a private school in Rajkot city, India. **Materials and Methods:** A cross-sectional study was carried out among the 1219 students of a private school of science stream in Rajkot city, adopting multistage sampling methods. Students were screened using Patient Health questionnaire-9 (modified for teens) for depression. A pre-tested semi-structured questionnaire was used to assess the determinants associated with depression. Binary logistic regression analysis was done to find out predictors of depression. **Results:** About 31.99% of students were found suffering from depression. Physical illness, academic performance, substance abuse, feeling study tough, difficulties in transport, food, monetary and accommodation at a hostel or home, pressure from parents for study, physical activities, sleep disturbance, and bad relations with teachers and classmates were significantly associated with depression. While parental education, physical illness, addiction to any substance, and academic performance emerged only as a predictor of depression. **Conclusion:** The present study showed a significant proportion of students suffering from depressive symptoms and revealed predictors of depression among the students. These required integrated efforts to minimize the risk of depression among the students.

Keywords: Depression, determinants, patient health questionnaire, students

INTRODUCTION

World Health Organization (WHO) defines adolescence as a period between 10 and 19 years of age in which development and transition occur in physical, psychological, social, and cognitive domains. These changes are associated with confusion, stress, and emotional instability among adolescents.^[1]

In India, the prevalence of depression is estimated to vary across different kinds of studies, with prevalence ranging from 1.2% to 21% in the clinic setting, 3% to 68% in a school setting, and 0.1% to 6.9% in the community setting.^[2] Depression among adolescents most often remains undiagnosed because irritability and mood fluctuation is the most prominent presenting symptoms.^[3] Depression can also be missed due to unexplained physical symptoms, anxiety, poor academic

performance, eating disorders, and other behavior problems if these are the primary presenting symptoms.

Depression has complex multifactorial causations, and many risks and protective factors are reported in different kinds of literature. A post-pubertal rise in the prevalence of depression is attributed to puberty, brain, and cognitive maturation, which involves enhanced social understanding, self-awareness,

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response to reward, punishment and danger, and increased stress levels.^[4,5] Some studies showed that those who are at high genetic risk are susceptible to environmental factors such as acute life events (bereavement, personal injury) and chronic adversities (family discord, bullying by peer, maltreatment by parent, peer and teachers, poverty, and physical illness).^[6,7] There are depression resilience individual factors that protect high-risk adolescents from developing depression including inherited factors, high intelligence, and some modifiable determinants such as emotion regulation and stress coping capacity and thinking style.^[8]

In a comparative study done in Gujarat, non-science stream students were less depressed than science stream students.^[9] Students of science streams of higher secondary private schools are going through great mental stress because of the highly competitive environment in the school and the expectation and pressure of parents for better academic performance. There is a need to understand various determinants, whether protective or conducive to developing depression during adolescence. The present study was carried out to explore the various determinants for the development of depression among higher secondary science stream students in Rajkot city, Gujarat.

MATERIALS AND METHODS

The cross-sectional study was carried out among the students of the science stream of a private higher secondary school in Rajkot city from June 2017 to March 2018. Ethical approval was obtained from the institutional ethics committee of P.D.U. Medical College, Rajkot dated 16/06/2017. Consent was obtained from study participants before the interview.

The sample size was estimated by taking 25% prevalence (P) of depression from a previous study done in India,^[10] relative precision of 10% of P, and a level of significance at 95%. Accordingly, the derived sample size was 1200 students.

There was a total of 57 private or self-finance higher secondary schools of science stream in Rajkot city. A total of 14 schools were selected using a lottery method of simple random sampling and one 11th and 12th standard class each was identified from the selected schools. In schools with more than one class of 11th or 12th standard, one class of each standard was selected using the Lottery method. The students from the selected classes who were present at the time of the visit to the school and given consent were included in the study, maintaining the ratio of about 50% of students from 11th and 12th standard each. At the end of the study, total of 1219 students (612 of 11th class and 607 of 12th class) were interviewed for the study.

Data collection and analysis

Two types of questionnaires were used to interview the students; 1. Patient Health Questionnaire-9 (PHQ-9) modified for teen^[11] and, 2. Questionnaire for evaluating the determinants of depression. Both questionnaires were translated into the Gujarati language and then back-translated into English to

check the consistency. Face validity of both questionnaires was carried out by authors by pretesting the questionnaire among 20 students each from Gujarati and English medium who were not part of the sample to see whether the questions were understandable and fulfilled the objectives of the study and then necessary corrections were made into questionnaires. The final version of the questionnaires was self-administered to the participants with maintaining privacy to fill out in a classroom under the direct observation of the investigators and teachers and return to the investigators. The questionnaires were administered to participants in English or Gujarati language according to the medium of school.

The students were screened for depressive symptoms using Patient Health Questionnaire-9 (PHQ-9) modified for teens.^[11] It is a screening tool as well as can be used to estimate the severity of depression. It scores each of the nine criteria of the Diagnostic and Statistical Manual of Mental Disorders-IV from "0" (not at all) to "3" (nearly every day).

The questionnaire for evaluating the determinants (risk or protective) of depression were administered to collect information on occupation, income and education of parents, family details, personal information regarding hobby, habits, eating patterns, physical activities, time spent on tv and gaming, relations with family, friends, teachers and relatives, academic performance, and other relevant information.

The data entering and editing were done in Microsoft Excel version 2013 and exported to trial version 28.0 of the Statistical Package of Social Science package from IBM. The Chi-square test was calculated to find out the significantly associated factor in categorical data. Binary logistic regression analysis was done to evaluate the determinant associated with depression among the students using.

RESULTS

A total of 1219 students were studied. Table 1 showed a significantly higher prevalence of depression among female students, students from Muslim communities, and those residing at a hostel or paying guests. The prevalence of depression was higher among the students of parents having no formal education.

An association of factors with depression [Table 2]: The students who had a physical illness and had addiction were statistically more depressed than their counterparts. A statistically significant difference in depression was observed among the students whose academic performance was declining than those performing well.

An association of depression with various kinds of perception [Table 3]: The students who frequently felt study tough and had difficulty with food and residence were more depressed. A significant proportion of students facing problems with classmates and teachers, parents' pressure to study and fulfill expectations, and sleep distribution were found to be significantly more depressed.

Predictor of depression among students [Table 4]: Binary logistic regression was applied to explore the predictors of depression among the students, taking depression as a dependent variable and others as an independent variable. The variables that emerged as a predictor of depression were parents not having a formal education, physical illness, a

static decline in academic performance, and addiction to any substance.

DISCUSSION

A total of 1219 students were screened for depressive symptoms and their associated factors. About 31.99% of students were found suffering from depressive symptoms. In the present study, a higher prevalence of depression was observed among female students, students of the Muslim religion, those residing in hostels, and students whose parents were not having a formal education. A similar finding regarding gender disparity was also observed in previous studies in which girls were more depressed than boys.^[12,13] The biological theory and difference between the physical makeup of boys and girls after puberty can explain the observed disparity. Females are also at higher risk due to age-related behavioral changes and fluctuation in hormonal levels.^[14] Hostel life poses many difficulties and hurdles, such as financial crisis, adjustment issues, distress, food issue, helplessness, sleep disturbance and many more issues, and also deprivation of a protective environment of family. This can explain the difference observed in depressive symptoms among the students residing in home and hostel in the present study.^[15] A finding similar to the present study was monitored by Kumar A *et al.*^[16] However, no relation between the type of living accommodation and depression among the students was observed by Bhattarai *et al.*^[17]

Table 1: Prevalence of depression as per various demographic characteristics

| Variables | Depression present frequency (%) | Total frequency (%) | Test of significance |
|------------------------|----------------------------------|---------------------|----------------------|
| Sex | | | |
| Male | 261 (29.90) | 873 (100.0) | $P=0.013$ |
| Female | 129 (37.28) | 346 (100.0) | |
| Religion ($n=1210$) | | | |
| Hindu | 344 (30.34) | 1134 (100.0) | $P<0.001$ |
| Muslim | 44 (57.89) | 76 (100.0) | |
| Residence ($n=1211$) | | | |
| Home | 302 (29.81) | 1013 (100.0) | $P<0.001$ |
| Hostel | 84 (42.42) | 198 (100.0) | |
| Education of father | | | |
| Not formally educated | 46 (51.11) | 90 (100.0) | $P<0.001$ |
| Formally educated | 344 (30.47) | 1129 (100.0) | |
| Education of mother | | | |
| Not formally educated | 61 (51.69) | 118 (100.0) | $P<0.001$ |
| Formally educated | 329 (29.88) | 1101 (100.0) | |

Table 2: Association of depression with various factors

| Variables | Depression Frequency (%) | Total Frequency (%) | Test of Significance |
|-----------------------------------|--------------------------|---------------------|----------------------|
| BMI category | | | |
| Underweight (<18.50) | 124 (28.44) | 436 (100.0) | $P=0.120$ |
| Normal (18.5-22.99) | 160 (33.26) | 481 (100.0) | |
| Obese (≥ 23) | 106 (35.01) | 302 (100.0) | |
| Physical illness | | | |
| Present | 43 (74.14) | 58 (100.0) | $P<0.001$ |
| Absent | 347 (29.89) | 1161 (100.0) | |
| Self-perception of study going on | | | |
| Very good | 114 (21.39) | 533 (100.0) | $P<0.001$ |
| Satisfactory/Bad | 276 (40.23) | 686 (100.0) | |
| Performance in study | | | |
| Improving | 198 (25.19) | 786 (100.0) | $P<0.001$ |
| Static/declining | 192 (44.34) | 433 (100.0) | |
| Time spent on TV in a day | | | |
| ≤ 1 h | 326 (31.26) | 1043 (100.0) | $P=0.179$ |
| > 1 h | 64 (36.36) | 176 (100.0) | |
| Time spent on mobile in a day | | | |
| < 30 min | 259 (30.51) | 849 (100.0) | $P=0.092$ |
| > 30 min | 131 (35.41) | 370 (100.0) | |
| Time spend for study in a day | | | |
| < 8 h | 338 (31.68) | 1067 (100.0) | $P=0.531$ |
| > 8 h | 52 (34.21) | 152 (100.0) | |
| Addiction | | | |
| Present | 36 (92.31) | 39 (100.0) | $P<0.001$ |
| Absent | 354 (30.00) | 1180 (100.0) | |

Table 3: Association of depression with various kinds of perception

| Variables | Depression Frequency (%) | Total Frequency (%) | Test of Significance |
|---|--------------------------|---------------------|----------------------|
| Feeling of study is too tough | | | |
| Frequently | 45 (59.20) | 76 (100.0) | <i>P</i> <0.001 |
| Sometimes/Never | 345 (30.18) | 1143 (100.0) | |
| Feeling any difficulties regarding meal | | | |
| Frequently | 38 (70.37) | 54 (100.0) | <i>P</i> <0.001 |
| Sometimes/Never | 352 (30.21) | 1165 (100.0) | |
| Feeling any difficulties regarding residence/hostel | | | |
| Frequently | 14 (66.67) | 21 (100.0) | <i>P</i> <0.001 |
| Sometimes/Never | 376 (31.39) | 1198 (100.0) | |
| Parents put pressure on the study | | | |
| Frequently | 42 (66.67) | 63 (100.0) | <i>P</i> <0.001 |
| Sometimes/Never | 348 (30.10) | 1156 (100.0) | |
| Relation with teachers | | | |
| Bad | 36 (58.06) | 62 (100.0) | <i>P</i> <0.001 |
| Good | 354 (30.60) | 1157 (100.0) | |
| Relation with classmates | | | |
| Bad | 27 (72.97) | 37 (100.0) | <i>P</i> <0.001 |
| Good | 363 (30.71) | 1182 (100.0) | |
| Feeling any difficulties regarding monetary | | | |
| Frequently | 41 (64.06) | 64 (100.0) | <i>P</i> <0.001 |
| Sometimes/Never | 349 (30.22) | 1155 (100.0) | |
| Feeling sleep-related problem | | | |
| Frequently | 68 (70.10) | 97 (100.0) | <i>P</i> <0.001 |
| Sometimes/Never | 322 (28.70) | 1122 (100.0) | |

Table 4: Regression analysis to evaluate selected factors for depression

| Variables | <i>P</i> | OR | 95% CI of OR |
|--|----------|-------|--------------|
| Father having no formal education | 0.017 | 1.108 | 1.018-1.205 |
| Mother having no formal education | 0.0001 | 2.511 | 1.711-3.684 |
| Having a underweight (<18.50) BMI category | 0.11 | 0.797 | 0.601-1.056 |
| Having overweight (23-24.99) and obese BMI category | 0.52 | 1.085 | 0.801-1.469 |
| Having a less physical illness | 0.0001 | 6.725 | 3.687-12.266 |
| Static/declining performance in the study | 0.0001 | 2.365 | 1.844-3.034 |
| Having addiction | 0.0001 | 28.00 | 5.566-91.52 |
| Frequently feeling study is too tough | 0.0001 | 0.341 | 0.251-0.450 |
| Frequently feeling difficulties regarding food | 0.0001 | 0.374 | 0.299-0.468 |
| Frequently feeling difficulties regarding residence/hostel | 0.0001 | 0.278 | 0.204-0.378 |
| Parents frequently put pressure on the study | 0.0001 | 0.459 | 0.372-0.566 |
| Relation with teachers | 0.0001 | 0.456 | 0.372-0.559 |
| Relation with classmates | 0.0001 | 0.335 | 0.265-0.423 |
| Frequently feeling difficulties regarding monetary | 0.0001 | 0.464 | 0.376-0.573 |
| Frequently feeling that doing less physical activity | 0.0001 | 0.431 | 0.360-0.515 |
| Frequently feeling sleep-related problems | 0.0001 | 0.331 | 0.272-0.404 |

Parental education level overall shapes the health of offspring.^[18] Parental low education level influences the child's mental health by deciding the material conditions, parenting skills, socioeconomic status, and family stress level.^[19] A protective effect of parental education on mental well-being was observed in a study done in the USA.^[20] On the contrary, a study in Bangladesh revealed that higher maternal education was associated with depression among adolescents.^[21]

In the current study, significant associated factors with depressive symptoms among the students were the presence of physical illness, poor academic performance, addiction to any substance, feeling study tough more often, frequent facing difficulties in low-quality food, monetary and accommodation at a hostel or home, regularly feeling pressure from parents for study, feeling doing less physical activities, sleep disturbance and having bad relation with teachers and classmates. Chronic adversities like physical illness and bereavement seem

associated with the occurrence of depression among children having high genetic risks.^[7,22] A consistent finding of poor academic performance and depression among students was observed in a previous study conducted in Ethiopia.^[23] This can be explained by the bi-directional association between depression and academic performance.^[24,25] The study in India also supported the association observed between substance abuse and depression among the student in the current study.^[26] Low quality of food and monetary issues are more often seen in students of parents with lower socioeconomic status and those residing at the hostel, which is associated with depressive symptoms in students.^[15] A higher proportion of depression among students from a family with lower and middle socioeconomic status was found in the study conducted in Malaysia.^[27] Compared to the current study, no association was observed between a relationship with peers and depression among the students, while a higher proportion of depression was found in students with an average relationship with teachers in a previous study.^[28] A comparable finding of depression among the students and parental pressure for academic performance was found by Kumar *et al.*^[16] A consistent finding in the current study of a higher prevalence of depression among students, who having not sufficient physical activities per day was noted in Bangladesh.^[21] Physical exercise increases self-esteem and improves the quality of sleep and overall health, which indirectly improves academic performance and reduces depressive symptoms.^[29,30]

In regression analysis, the factors found with higher odds of developing depression among the students were parents having no formal education, doing fewer physical activities, poor academic performance, and addiction to any substance in the present study. Previous studies have reported doing fewer physical activities per day, higher parental education, food insecurity, and higher television viewing time per day, gender, rural area, social support, grade of study, childhood major life event, low economic family, alcohol consumption, future tension family history of mental illness, type of institution, childhood emotional abuse, sex after drinking, academic performance, pocket money as a predictor of depression among the students.^[21,13,23]

CONCLUSION

The present study provided information about the magnitude of depression among the students. It revealed parental education, physical activity, academic performance level, and substance abuse as significant predictors of depression among the students. The educational institute could implement physical training programs like yoga, meditation, and other outdoor exercises as extracurricular activities to improve physical and mental health and, thereby, students' academic performance. Schools can enhance parental skills by utilizing parent-teacher meetings to educate the parent about various factors associated with depression among the students and counsel them to change their behavior and attitude towards children. An institution may address the problems related to

food, transport, and living condition at a hostel to enhance the satisfaction of students living at the hostel. Student mentoring programs, the ongoing process can help improve students' academic performance, and student-teacher relations, and it gives opportunities to assess the psychological status of students through one-to-one communication. There must be appropriate referral linkage to the treatment center for effective management of students suspected of psychiatric morbidity in screening. The parent should provide support and motivation to students to face difficulties and challenges in their studies. The study emphasizes regularity in the studies for students and suggests students make a schedule for different activities of daily living.

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Conflicts of interest

There are no conflicts of interest.

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