**Original Research Article**

**Prevalence and Risk Factors of Adolescent Depression in Urban and Rural Bangladesh: A Cross-Sectional Study**

**Abstract**

**Aims:** Adolescent depression is a significant concern in Bangladesh, as many young people experience depression without access to adequate treatment. This study aimed to explore the prevalence of depression and the factors contributing to this mental health issue among adolescents in urban and rural Bangladesh.

**Study Design:** Cross sectional study.

**Sample:** This study was conducted with 389 adolescents in grades 8 to 10 from Dhaka and Noakhali districts.

**Methodology:** Data were gathered through a questionnaire that included questions about socio-demographics, lifestyle factors, and mental health. χ2 test and logistic regression model were used for analysis purpose. All statistical analysis were performed in STATA (16.0).

**Results:** A total of 35.21% of adolescents reported experiencing depressive symptoms, with a higher prevalence among females (36.8%) compared to males (32.9%). Socio-demographic factors such as gender, place of residence, and school grade were significantly associated with depression. Logistic regression analysis revealed that screen-based sedentary behaviors (SBSBs) like social media use (OR: 1.06; 95% CI: 0.45–2.72), high screen time (over 2 hours per day; OR: 1.24; 95% CI: 0.69-2.54), and sleep disturbances (OR: 1.33; 95% CI: 0.76-2.63) were significantly related to depressive symptoms.

**Conclusions:** Depressive symptoms are widespread among adolescents in both urban and rural areas of Bangladesh. Consequently, it is essential to implement urgent measures to mitigate the rise of depression among Bangladeshi adolescents.

**Keywords:** Depression, lifestyle, risk factors, socio-demographic, urban and rural adolescents.

**1 Introduction**

Adolescence, spanning ages 10 to 19, is a transitional stage between childhood and adulthood. During this period, adolescents undergo numerous physical, emotional, and social changes, and exposure to challenges such as poverty, abuse, or violence can increase their vulnerability to mental health problems. (1). Depression is one of the most common mental health issues worldwide. It is one of the under recognized health concerns in adolescents due to their incapacity to reveal their feelings and their reluctance to seek psychiatric assistance (2). Depression is related with poor health behaviors and social difficulties. In addition to an increased risk of suicide, depressed youths are at a higher risk for mental disorders such as anxiety, issues with behavior, and substance addiction (3). According to estimates by the World Health Organization, adolescents make up 10.2% of Bangladesh’s population, totaling approximately 16.4 million (8.4 million boys and 8.0 million girls). Many of these young individuals experience serious mental health challenges, including suicidal thoughts and behaviors, anxiety, feelings of loneliness, a lack of close friendships, and the use of substances such as tobacco, cigarettes, alcohol, marijuana, and other drugs. (4). However, most adolescent depressive problems do not receive enough attention, leading to depression recurrence in later adulthood (5). At any given time, 3 to 9% of teenagers fulfill the criteria for depression, and by the end of adolescence, as many as 20% of teenagers report a lifetime prevalence of depression. Primary care physicians fail to identify 30-50% of depressive patients (6). Recognizing depression as early as possible may be crucial to lowering the prevalence of depression in older people, managing depression more effectively, and avoiding unfavorable effects (7).

Depression is a common mental health problem affecting over 264 million people. In a nationwide cross-sectional survey, the overall prevalence of no or little, mild, moderate, moderately severe, and severe depression was 75.5%, 17.9%, 5.4%, 1.1%, and 0.1%, respectively. Adolescent girls had a greater frequency of depression across major socio-demographic, lifestyle, and anthropometric strata (8). In a study, 25.3% of adolescents were reported to be distressed (9). A research in the United States found that 18% of youths had depression symptoms. Females (25%) reported more depressive symptoms than males (10%). The prevalence of depressive symptoms rose with age in both males and females (3). In another study, the prevalence of depression was found to be 49.2%, with a 7.7% prevalence of severe depression. The overall prevalence of depression was significantly greater in girls (55.1%) than in boys (45.8%) (2). Also another study found that 33.5 % adolescents experiencing depressive symptoms (10). Adolescent depression is a concerning issue in Bangladesh, as a huge proportion of Bangladeshi adolescents suffer from depression yet are unable to receive proper treatment. An investigation on urban and semi-urban adolescent depression in Bangladesh found a prevalence rate of 36.6% (5). In a study, the most common depressive symptoms were sadness (45.3%) and anger (40.5%), followed by confusion (27.7%), worthlessness (21.8%), weariness (21.5%), and sleeplessness (18.0%). The gender of the student, grade level of study, and daily sleep length all showed varying relationships with these symptoms (11). The prevalence of moderate to severe depression was found to be 8.2% (12). Bangladesh's government created a national adolescent health strategy to prioritize initiatives to promote adolescent health from 2017 to 2030. The mental health of adolescents is one of the document's four key areas (13).

Adolescent depression is a critical public health concern in Bangladesh due to its high frequency and recurrence, since it enhances the risk of suicide and other psychiatric diseases, contributing to the overall disease burden. According to studies, adolescents in Bangladesh suffer tremendously from depression, anxiety, loneliness, a lack of close companions, bullying, substance usage, and smoking. Despite the fact that a considerable majority of adolescents suffer from these issues, little research has been conducted on the subject. This study focuses on the prevalence of depression and several factors linked with depressive symptoms in adolescents, such as socio-demographic and lifestyle factors. A study (5) was conducted on adolescents in urban and semi-urban school adolescents in Dhaka city in Bangladesh, but no studies on urban (Dhaka district) and rural (Noakhali district) regions in Bangladesh have been conducted. In other words, a local prevalence survey was necessary for the development of public health responses to a mental disease in adolescents. For this reason, this study aims to examine the prevalence of depression among urban and rural adolescents (aged 10–19 years) in Bangladesh and to assess the socio-demographic and lifestyle factors associated with depressive symptoms among young adolescents in Bangladesh.

**2 Methodology**

**2.1 Survey Design & Participants**

This cross-sectional study was conducted in urban and rural Bangladesh between January 2024 and April 2024. A multi-stage sampling technique was employed to recruit subjects for this study. In our study, we have selected districts as the primary sampling unit (PSU) and then selected schools as the secondary sampling unit (SSU). In the first stage, we have selected Dhaka (urban) and Noakhali (rural) districts as primary sampling unit, then we have selected schools conveniently located in the study area. In the selected schools, we have randomly selected class 8, 9, and 10 and students in the selected classes were the participants in this study. A total of 430 students filled out the form, and after data cleaning, 389 students were considered in this study**.**

**2.2 Survey Tool and Outcome Measures**

This study employed the nine-item Patient Health Questionnaire (PHQ-9) in order to measure the level of depression of the participants, corresponding to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition diagnostic criteria of symptoms for major depressive disorder. Socio-demographic data were collected from the participants such as their age, gender, school grade, residence, birth order, number of family members, and parents’ educational status through questionnaire. This study also collected lifestyle-related data by asking questions concerning regular physical activity, sleeping satisfaction, number of sleeping hours per night, and social media use.

**2.3 Statistical Analysis**

Data analysis included both descriptive and inferential statistics. Descriptive analyses have performed to report on the respondent’s background characteristics. To identify significant association between the research variables χ2 test was used. Logistic regression model was used to determine the relationship between categorical dependent and independent variables. The findings were generated using STATA (16.0) software.

**3 Results**

**3.1 Descriptive Analysis**

Table 1 summarizes the socio-demographic and lifestyle characteristics of the respondents who took part in this study. Among 389 participants most of the respondents are 16 years old (n = 149, 38.3%) and from class 8 (n = 139, 35.7%). Male and female respondents were 231 (59.4%) and 158 (40.6%). Most respondents reside in urban areas (n=198, 50.9). The study discloses that 156 (40.1%) of the participants were the first child of their parents. Most of the respondents (n = 224, 57.5%) have more than four members in their family. Regarding the father’s educational degree, most of them are graduates/above (n = 168, 43.2%). A high proportion (n = 177, 45.5%) of their mother’s academic qualification is secondary/higher secondary level.

**Table 1**: Percentage distribution of the background characteristics of students.

|  |  |  |  |
| --- | --- | --- | --- |
| **Variables** | **Categories** | **Frequency** | **Percentage** |
| Gender | Male | 158 | 40.6 |
|  | Female | 231 | 59.4 |
| Student grade | Class 8 | 139 | 35.7 |
|  | Class 9 | 121 | 31.1 |
|  | Class 10 | 129 | 33.2 |
| Age | 13 | 43 | 11.1 |
|  | 14 | 97 | 24.9 |
|  | 15 | 85 | 21.9 |
|  | 16 | 149 | 38.3 |
|  | 17 | 15 | 3.9 |
| Residence | Rural | 191 | 49.1 |
|  | Urban | 198 | 50.9 |
| Birth order | 1 | 156 | 40.1 |
|  | 2 | 112 | 28.8 |
|  | 3 | 121 | 31.1 |
| Total number of family member |  | 165 | 42.4 |
|  | 5 | 224 | 57.6 |
| Father’s education | Primary | 64 | 16.5 |
|  | Secondary/ higher secondary | 157 | 40.4 |
|  | Graduate/above | 168 | 43.2 |
| Mother’s education | Primary | 98 | 25.2 |
|  | Secondary/ higher secondary | 177 | 45.5 |
|  | Graduate/above | 114 | 29.3 |
| Involved in physical activity | Yes | 181 | 46.5 |
| Duration of daily physical activity (n=181) | No | 208 | 53.5 |
| <30 min | 76 | 42 |
|  | 30-60 min | 57 | 31.2 |
|  | >60 min | 48 | 26.5 |
| Use of social media | Yes | 288 | 74 |
|  | No | 101 | 26 |
| Duration of daily social media use (n=288) | 2 hours | 135 | 46.9 |
|  | >2 hours | 153 | 53.1 |
| Sleep satisfaction | Yes | 164 | 42.2 |
|  | No | 225 | 57.8 |
| Sleep duration daily | Short sleep (<7 hours) | 148 | 38 |
|  | Ideal sleep (7-9 hours) | 84 | 21.6 |
|  | Long sleep (>9hours) | 157 | 40.4 |

Table 1 shows that among those who responded, 181 (46.5%) participants involved in physical activity, and majority of their (n=76, 42%) daily physical activity time are less than 30 minutes. study for 1-2 hours daily, while 115(29.9%) study for less than one hour. Surprisingly, among the students who have participated in this study, 288 (74%) participants use social media on a regular basis. It has been revealed that a substantial proportion of students (n = 153, 53.1%) use social media for more than 2 hours regularly. Most students (n = 225, 57.8%) do not have sleep satisfaction. A high proportion of respondents (n = 157, 40.4%) sleep for more than 9 hours.

**Figure 1.** Prevalence of depression among adolescents in Bangladesh.

Figure 1 illustrates the prevalence and severity of depression among the participants. It reveals that 5.8% experienced severe depression, while 30.7% were in a normal state. Additionally, 32.9% reported mild depression, 20.4% were classified as moderately depressed, and 10.2% were experiencing moderately severe depression during the data collection period.

# **3.2 Bivariate Analysis**

Table 2 shows that a higher percentage of females (36.8%) experienced depression compared to males (32.9%), and this difference was statistically significant (p = 0.002). The highest proportion of depressed students, at 45%, was found in class 10, which was also statistically significant (p = 0.004). Additionally, 39.9% of participants from urban areas reported depression, while 30.4% of those from rural areas did.

**Table 2:** Association of socio-demographic variables with depression.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variables** | **Categories** | **Frequency (% within variable)** | ***χ*2 value** | **P-value** |
| Gender | Male | 52 (32.9) | 9.24 | .002 |
|  | Female | 85 (36.8) |  |  |
| Student grade | Class 8 | 43 (30.9) | 11.14 | .004 |
|  | Class 9 | 36 (29.8) |  |  |
|  | Class 10 | 58 (45) |  |  |
| Age | 13 | 13 (30.2) | 8.62 | .087 |
|  | 14 | 29 (29.9) |  |  |
|  | 15 | 51 (60) |  |  |
|  | 16 | 41 (27.5) |  |  |
|  | 17 | 3 (20) |  |  |
| Residence | Rural | 58 (30.4) | 12.69 | <.001 |
|  | Urban | 79 (39.9) |  |  |
| Birth order | 1 | 56 (35.9) | 5.54 | .064 |
|  | 2 | 41 (36.6) |  |  |
|  | 3 | 40 (33.1) |  |  |
| Total number of family member |  | 65 (39.4) | 0.70 | .40 |
|  | 5 | 72 (32.1) |  |  |
| Father’s education | Primary | 18 (28.1) | 4.91 | .087 |
|  | Secondary/ higher secondary | 46 (29.3) |  |  |
|  | Graduate/above | 73 (43.5) |  |  |
| Mother’s education | Primary | 39 (39.8) | 0.95 | .62 |
|  | Secondary/ higher secondary | 81 (45.8) |  |  |
| Graduate/above | 17 (14.9) |  |  |

Table 3 shows a significant association between lifestyle patterns and depression. In this study, 35.1% of participants who used social media reported experiencing depression. Furthermore, 47.7% of students who spent more than 2 hours on social media were found to be depressed. Additionally, 42.2% of respondents with sleep disturbances reported depressive symptoms.

**Table 3:** Association of lifestyle variables with depression.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variables** | **Categories** | **Frequency (% within variable)** | ***χ*2 value** | **P-value** |
| Involved in physical activity | Yes | 85 (47) | 3.15 | .077 |
|  | No | 52 (25) |  |  |
| Duration of daily physical activity | <30 min | 37 (48.7) | 4.62 | .203 |
|  | 30-60 min | 26 (45.6) |  |  |
|  | >60 min | 22 (45.8) |  |  |
| Use of social media | Yes | 101 (35.1) | 8.61 | .003 |
|  | No | 36 (35.6) |  |  |
| Duration of daily social media use | 2 hours | 64 (47.4) | 8.18 | .004 |
|  | >2 hours | 73 (47.7) |  |  |
| Sleep satisfaction | Yes | 42 (25.6) | 29.83 | <.001 |
|  | No | 95 (42.2) |  |  |
| Sleep duration daily | Short sleep (<7 hours) | 58 (39.2) | 1.54 | .464 |
|  | Ideal sleep (7-9 hours) | 46 (54.8) |  |  |
|  | Long sleep (>9hours) | 33 (21) |  |  |

**3.3 Multivariate Analysis**

Table 4 revealed that students being in class 9 (P-value<0.05) significantly impacts the depressive symptoms among adolescents. Also, it is observed that daily average social media use (P-value<0.05) expressively influences the depressive symptoms of respondents. Furthermore, students who use social media for more than 2 hours daily have 24% more odds (OR: 1.24; 95% CI: 0.69-2.54, P< 0.05) of getting depression than who use social media for 2 or less than 2 hour. The outcome suggests that the individuals who has no sleep satisfaction are 1.33 times (OR: 1.33; 95% CI: 0.76-2.63, P<0.05) more likely to get depression than the individuals who has sleep satisfaction.

**Table 4:** Logistic regression analysis table for identifying the impact of different background characteristics on depression.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variables** |  | **Odds Ratio** | **95% C.I.** | | | **Sig.** |
|  | **Lower** | **Upper** | |
| Gender | Female | 1.93 | 0.83 | 4.51 | | .137 |
|  | Male | 1 |  |  | |  |
| Student grade | Class 10 | 2.22 | 0.75 | 6.54 | | .158 |
|  | Class 9 | 2.56 | 1.07 | 6.15 | | .036 |
|  | Class 8 | 1 |  |  | |  |
| Age | 17 | 0.91 | 0.12 | 6.93 | | .916 |
|  | 16 | 1.39 | 0.36 | 5.35 | | .625 |
|  | 15 | 1.24 | 0.42 | 3.62 | | .702 |
|  | 14 | 1.01 | 0.41 | 2.54 | | .975 |
|  | 13 | 1 |  |  | |  |
| Residence | Urban | 1.05 | 0.47 | 2.04 | | .789 |
|  | Rural | 1 |  |  | |  |
| Involved in physical activity | Yes | 1.84 | 0.98 | 3.43 | | .06 |
|  | No | 1 |  |  | |  |
| Use of social media | Yes | 1.06 | 0.45 | 2.72 | | .004 |
|  | No | 1 |  |  | |  |
| Duration of daily social media use | >2 hours | 1.24 | 0.69 | 2.54 | | .001 |
|  | 2 hours | 1 |  |  | |  |
| Sleep satisfaction | No | 1.33 | 0.76 | 2.63 | <.001 | |
|  | Yes | 1 |  |  | |  |
| Sleep duration daily | Short sleep (<7 hours) | 1.13 | 0.28 | 4.61 | | .873 |
|  | Long sleep (>9hours) | 0.58 | 0.32 | 1.10 | | .097 |
|  | Ideal sleep (7-9 hours) | 1 |  |  | |  |

**4 Discussion**

Mental well-being is essential for living a balanced, healthy, and productive life. Yet, in countries like Bangladesh, mental health conditions are often neglected and not properly addressed as significant public health issues. In light of this, the present study aims to deliver a thorough and current analysis of depression symptoms among adolescents residing in both urban and rural areas of Bangladesh.

The results of this study indicate that a considerable number of adolescents in Bangladesh experience depressive symptoms, with a reported rate of 35.21%. This is notably higher than the 9.09% prevalence found in an earlier study conducted in Bangladesh (14). Also this is higher than the 25% prevalence found in a study conducted with 898 adolescents in the country (15). However, the prevalence found in this study is lower than the 49% reported in a previous study conducted in Bangladesh in 2012. (16).

In this study, female adolescents showed a higher level of depressive symptoms compared to their male counterparts, which is consistent with findings from research in other Asian countries. (17)(18). Studies suggests that female adolescents encounter greater difficulties during this transitional phase of life, largely due to major changes linked to puberty (19).

This study identified a significant difference in depressive symptoms between urban and rural participants. In a study, higher levels of depression were observed among individuals in rural areas compared to those in urban settings (20). Similarly, another study reported that urban residents experienced lower levels of depression than their rural counterparts (21).

This study also identified a strong association between self-reported sleep disturbances and depressive symptoms among adolescents. Prior research has shown that sleep problems are closely connected to the severity of depression, with insomnia being the most commonly reported issue. (22). A study conducted among Chinese adolescents found that individuals showing depressive symptoms were more likely to experience problems with sleep. (23). Also in another study it was found that 84.75% patients had sleep disorder (24).

The findings of this study indicate that depressive symptoms are more prevalent among Bangladeshi adolescents who spend extended periods on social media. Participants who reported using social media for over 2 hours a day were 1.24 times more likely to experience depressive symptoms compared to those who engaged in social media for less than 2 hours. In Bangladesh, excessive screen time is widespread, with 80% of adolescents in Dhaka reporting more than 2 hours of daily screen usage (25).

Although adolescent depression is a growing concern, it has not been widely explored in research. Moreover, to the best of our knowledge, no previous study has specifically examined adolescents from both urban and rural areas in Bangladesh. Therefore, the findings of this study can contribute to addressing adolescent health issues and support the development of relevant policies. It also paves the way for future research focusing on the mental health of adolescents across different regions of the country.

**5 Legal and Policy Implications**

Adolescent depression is a growing concern in Bangladesh, yet current laws and policies fall short in addressing youth mental health needs. The Mental Health Act 2018 lacks specific provisions for adolescents and does not mandate school-based services (26). Limited resources, few professionals, and low awareness further hinder implementation.

Although Bangladesh supports global commitments like the CRC, these are not fully reflected in national policy (27). Schools remain unequipped to provide mental health support, leaving many adolescents without care.

This study is crucial as it sheds light on the prevalence and risk factors of adolescent depression in both urban and rural areas. The findings can guide evidence-based policies and underscore the need for a legally binding adolescent mental health policy that ensures school counselors, education, protections, and access to care, turning support into a legal right and safeguarding youth well-being.

**6 Limitations**

This study has certain limitations. As it employs a cross-sectional design, data were gathered at one specific time, which may not provide a complete understanding of the issue and should be viewed cautiously. Moreover, the use of self-reported questionnaires may lead to recall bias. To improve the generalizability of the findings, further research with larger and more diverse samples from schools across wider geographic areas is recommended.

**7 Conclusions**

Adolescents are particularly vulnerable to various physical, psychological, and social factors that can lead to a range of mental health issues, potentially affecting their future. Despite the importance of adolescent mental health for any nation, it has not received significant attention in Bangladesh. Consequently, mental health disorders are having a serious impact on the country's youth. As this study indicates, many Bangladeshi adolescents are experiencing depression due to a combination of personal, academic, social, and familial factors. This is a critical public health concern, and large-scale research is needed to gather sufficient data that can inform national policies aimed at addressing adolescent health challenges in Bangladesh.

**Declarations**

**Human Participation and Consent**

This study took verbal consent from the participants at the time of survey data collection.

**Ethical Approval**

This study was carried out in accordance with ethical standards (as per The Code of Ethics of the World Medical Associatiuon). Ethical permission for data collection was received from Noakhali Science and Technology University Ethical Committee.

**Competing Interests**

Authors have declared that no competing interest exists.

**Disclaimer (Artificial intelligence)**

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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