# Factors Associated with Depression among School-going Adolescent Girls in a District of Northern India: A Cross-sectional Study 

Mukesh Shukla, Siraj Ahmad, Jai Vir Singh, Nirpal Kaur Shukla, Ram Shukla ${ }^{1}$


#### Abstract

Context: Depression among adolescents, especially among girls, is a rising public health problem worldwide. It has been associated with a profound negative impact on their physical, social, and mental well-being. Aim of the Study: To ascertain the factors associated with depression among school-going adolescent girls in district Barabanki of Uttar Pradesh. Settings and Design: School-based cross-sectional study. Subject and Methods: The study was conducted among 2187 school-going adolescent girls ( $10-19$ years) in Barabanki district from September 2016 to September 2017 using multistage sampling. Sociodemographic characteristics such as age, residence, family background, and socioeconomic status were assessed through direct interview of the adolescent girl, with its reconfirmation from school records. Eleven-item Kutcher Adolescent Depression Scale was used for assessment of depression. Statistical Analysis Used: Probability (P) was calculated to test for statistical significance at $5 \%$ level of statistical significance. Association between risk factors and depression was determined using bivariate analysis followed by multivariate logistic regression. Results: The prevalence of depression was found to be $39.7 \%$. Multiple logistic regression revealed that depression was significantly higher among those residing in rural areas [odds ratio (OR) $3.32 ; P<0.001$ ], those in early and mid-adolescent age group ( $O R 2.51 ; P<0.001$ ), those studying in private schools (OR 3.22; $P<0.001$ ), and those with Hindi as the medium of instruction (OR12.50; $P<0.001$ ). Depression was also found to be significantly higher among those whose mothers were educated up to primary (OR 3.19; $P<0.01$ ) or up to intercollege (OR $1.59 ; P<0.001$ ) when compared with illiterate mothers. Similarly, depression was found to be more common among those girls whose fathers were educated up to intercollege (OR 1.29; P<0.05) or were graduate and above ( $\mathrm{OR} 1.58 ; P<0.001$ ). Conclusion: A significant proportion of school-going adolescent girls were suffering from depression, which reflects the need for reinforcement and strengthening of school-based mental health screening programs. Parents, teachers, and community health workers should work as a team to deal with the problem in a more effective way.


Key words: Adolescent, depression, predictors

| Access this article online |  |
| :--- | :---: |
| Website: <br> www.ijpm.info | Quick Response Code |
|  |  |
|  |  |

[^0][^1]
## INTRODUCTION

There are about 1.2 billion adolescents worldwide, with one in every five people in the world being adolescent. ${ }^{[1]}$ In South-East Asia Region (SEAR) itself, there are about 350 million adolescents, comprising about $22 \%$ of the population. ${ }^{[2]}$ India is the second most populous country in the world with a total population of more than 1.21 billion, with an adolescent population of approximately 243 million. ${ }^{[3]}$

The period of adolescence represents a transitional stage from childhood to adulthood and represents the critical time frame during which an individual undergoes a variety of developmental changes along with an encounter with a number of emotional and psychosocial issues. Globally, it has been reported that depressive disorders often start at an early age, with prevalence rates of mental illness among children and adolescents ranging between $1 \%$ and $51 \%{ }^{[4]}$ More precisely, among adolescents between the age of 14 and 19 years, the prevalence was reported to be from $15 \%$ to $20 \% \cdot{ }^{[5]}$ Depression is a global concern for children, adolescents, and adults even in developed nations. ${ }^{[6]}$ Major depression was the fourth most frequent human illness in 1990 and is projected to rank second by the year 2020 in the adolescent age group. ${ }^{[7]}$ In India, the combined prevalence of depression and anxiety among school-going adolescents has been reported as $57.65 \%$, with $3 \%$ cases of extremely severe depression. ${ }^{[4]}$ Depressive disorders are reported to be considerably more common in females, with a lifetime prevalence of $14.1 \%$ for females and $8.6 \%$ for males. ${ }^{[8,9]}$ This has been attributed to genetics, increased prevalence of anxiety disorders in females, biological changes associated with puberty, cognitive predisposition, and sociocultural factors. ${ }^{[10]}$ From health-seeking and treatment point of view, about half of depressed adolescents are left undiagnosed in primary care settings. ${ }^{[11]}$

Depression also has a deep effect on adolescents' psychosocial domain and academic performance. More often, they are more preponderate toward probability for hospitalizations, recurrent depressions, substance abuse, and antisocial behaviours, and with time, the most devastating outcome is suicide, which is the third leading cause of death among older adolescents. ${ }^{[12]}$ Studying the level of depression and its association with various biosocial factors among adolescents, especially girls, will help in the development of effective preventive strategies. Based on the findings of a preliminary study done in the settings where this study was conducted, ${ }^{[13]}$ this was conducted as a more extensive study to estimate the prevalence of depression among school-going adolescent girls and various sociodemographic associated with it.

## SUBJECT AND METHODS

This was a cross-sectional study among school-going adolescent girls (10-19 years) studying in government, government-aided, and private schools of Barabanki district in Uttar Pradesh from September 2016 to September 2017.

## Sample size

Assuming the prevalence of depression to be 18.7\% based on the finding of the preliminary study, ${ }^{[13]}$ an absolute precision of $2 \%$, and design effect of 1.5, the total sample size calculated was 2187 (formula used: $n=D z^{2} p q / d^{2}$; where $n=$ sample size, $D=$ design effect, $z=$ value of standard normal deviate $=1.96$ at $95 \%$ confidence interval (CI), $p=$ prevalence of nonadherence, $q=1-p$, and $e=$ absolute precision). ${ }^{[14]}$

## Sampling technique

Multistage sampling technique was used. In the first stage, Barabanki district was divided into urban Barabanki and blocks of rural Barabanki. From the different blocks of rural Barabanki, two blocks were randomly selected. A detailed list of schools (both government and private) was obtained from officials of District Education Office for both urban and two randomly selected blocks of Barabanki district. In the second stage, a total of eight schools (four from an urban area and two schools each from two selected rural blocks) were selected randomly. Probability proportionate to size strategy was adopted to enrol a certain number of participants from each school. In the third stage, in each of the selected schools, a list of girl students was obtained from the principal. Then, the students were randomly selected from each class.

## Data collection

A predesigned and pretested questionnaire was used for baseline data, including questions related to the number of family members and family type, the educational and occupational status of parents, enjoyment modes, and involvement in routine, including indoor and outdoor, activities. Each question was elaborated by one of the investigators, and simultaneously, the students were asked to fill in their answers in the questionnaire. The investigators included one faculty member and one postgraduate resident of the Department of Community Medicine, who together received 2 weeks training in the psychiatry department of the institution before implementation and use of Kutcher Adolescent Depression Scale (KADS) in the school settings.

## Assessment of depression

Eleven-item KADS, specifically designed to diagnose and assess the severity of adolescent depression, was used. Items are scored from 0 to 3 , with 0 denoting
"hardly ever" and 3 "all of the time." The scores range from 0 to 33. Higher scores indicate a greater number of depressive symptoms. ${ }^{[15]}$ For the purpose of analysis, the score was dichotomized, with $\geq 9$ being indicative of depression. Used with a cut-off score of 9, the 11 -item KADS has sensitivity and specificity of $89 \%$ and $90 \%$, respectively. ${ }^{[16]}$

## Statistical analysis

Data collected were directly entered, after data cleaning and rechecking, to Epi Info software. Independent variables that were found to be statistically significant in univariate analysis were considered for logistic regression model to determine the important correlates, with depression as the dependent variable. A $P$ value of $\leq 0.05$ was considered statistically significant.

## Ethical clearance

Prior permission was obtained from the District Education Officer (DEO), Barabanki, and principals of the selected schools before conducting the study, and parents were informed too through school channels. Assent was also obtained from the students after explaining to them about the objectives of the study and assuring them that their responses would be kept confidential. Permission to carry out the study was obtained from the Institutional Ethics Committee. In addition, owing to ethical responsibility, parents of those adolescents who screened positive for depression were informed with the help of school authorities and assisted for proper health seeking to a nearby health facility for further evaluation. But no data were thereafter gathered during follow-up due to feasibility and attrition issues.

## RESULTS

## Biosocial characteristics

Of the total 2187 school-going adolescent girls enrolled in the study, almost half (47.1\%) were in the age group of 14-16 years (mid-adolescents), followed by $31 \%$ late adolescents and $21.9 \%$ early adolescents. About 45\% of the girls were studying in $11^{\text {th }}$ or $12^{\text {th }}$ standard (class). A majority (76.2\%) belonged to Hindu religion. Around $45.6 \%$ belonged to Other Backward Castes (OBC), followed by general category and Scheduled Caste/Tribes ( $64.9 \%$ and $65.5 \%$, respectively). Almost two-thirds belonged to a rural background and joint family (35.9\% and $18.5 \%$, respectively). About half (52.9\%) were studying in a government school, and a majority (76.0\%) had Hindi as the primary medium of instruction. Almost half ( $51.5 \%$ ) of the fathers of these girls were educated up to intercollege ( $12^{\text {th }}$ standard), with farming/agriculture work as their main occupation. Almost half (50.4\%) of the mothers were illiterate, and a majority of them were housewives (83.0\%). About two-thirds (66.2\%)
of the girls belonged to lower socioeconomic status [Table 1].

## Symptoms of depression during past 1 week

About $68.4 \%$ of the girls hardly ever reported low mood, sadness, or down feeling during the past I week. Around $66.9 \%$ mentioned that they hardly ever got irritable or lost temper easily or got pissed off during the past week. About $17.1 \%$ perceived that much of the time during the past 1 week, life was not very much fun and that they are not getting as much as pleasure from things as usual. About one-fifth (19.4\%) felt decreased interest in hanging out with friends, lack of interest in outings, and doing school work and recreational activities much of the time. Half (50.5\%) hardly ever suffered from a feeling of worthlessness or hopelessness or not being a good person during the last week. A major proportion (75.3\%) hardly ever felt tired, fatigued, unmotivated, and so on during the past l week, and $61.8 \%$ hardly ever had any trouble to concentrate. However, 10.1 \% felt worried, nervous, panic, tensed, and anxious much of the time. About one-fourth (25.2\%) reported physical symptoms such as headache, nausea, and restlessness much of the time over the last week. The majority (72.9\%) hardly ever reported of having any thoughts/plans/actions about suicide or self-harm over the last 1 week. However, seven girls ( $0.3 \%$ ) had the thought of suicide/self-harm almost all the time during the last 1 week [Table 2].

## Factors associated with depression

The prevalence of depression was found to be 39.7\%. Univariate analysis revealed that depression was significantly higher $(P<0.05)$ among girls in the early and mid-adolescent age group, those who belonged to general or OBC categories, those who reside in rural area, those who belonged to lower middle and upper socioeconomic status, those who study in private schools, and those who study in schools with Hindi as medium of instruction. Also, the higher literate status of parents (as compared to illiterate) and unemployed or in service occupational status of mother (when compared with labor/agricultural workers) were found to be associated more with chances of depression among the girls.

Multiple logistic regression revealed that depression was significantly higher among those residing in rural areas (odds ratio [OR] 3.32; 95\% CI 2.60-4.25; $P<0.001)$, those in early and mid-adolescent age group (OR 2.51; 95\% CI 1.85-3.33; P $<0.001$ ), those studying in private schools (OR 3.22; 95\% CI 2.32-4.54; $P<0.001$ ), and those with Hindi as the medium of instruction (OR 12.50; 95\% CI 8.33-20.0; $P<0.001$ )

Table 1: Distribution of school-going adolescent girls on the basis of background characteristics ( $n=2187$ )

| Biosocial characteristics | Number | Percentage (\%) |
| :---: | :---: | :---: |
| Age group (years) |  |  |
| Early adolescents (10-13) | 479 | 21.9 |
| Mid-adolescents (14-16) | 1030 | 47.1 |
| Late adolescents (17-19) | 678 | 31.0 |
| Class |  |  |
| $6^{\text {th }}-8^{\text {th }}$ | 657 | 30.0 |
| $9^{\text {th }}-10^{\text {th }}$ | 547 | 25.0 |
| $11^{\text {th }}-12^{\text {th }}$ | 983 | 44.9 |
| Religion |  |  |
| Hindu | 1666 | 76.2 |
| Non-Hindu | 521 | 23.8 |
| Category |  |  |
| General | 786 | 35.9 |
| Other Backward Caste | 998 | 45.6 |
| Scheduled Caste/Scheduled Tribe | 403 | 18.5 |
| Residence |  |  |
| Rural | 1420 | 64.9 |
| Urban | 767 | 35.1 |
| Type of family |  |  |
| Nuclear | 975 | 44.6 |
| Joint | 1212 | 65.5 |
| Type of school |  |  |
| Government | 1156 | 52.9 |
| Government-aided | 258 | 11.8 |
| Private | 773 | 35.3 |
| Medium of instruction |  |  |
| English | 524 | 24.0 |
| Hindi | 1663 | 76.0 |
| Father education |  |  |
| Illiterate | 583 | 26.7 |
| Up to primary | 418 | 19.1 |
| Up to intercollege | 1126 | 51.5 |
| Graduate and above | 60 | 2.7 |
| Mother education |  |  |
| Illiterate | 1103 | 50.4 |
| Up to primary | 472 | 21.6 |
| Up to intermediate | 570 | 26.1 |
| Graduate and above | 42 | 1.9 |
| Father occupation |  |  |
| Unemployed | 111 | 5.1 |
| Farmer/agricultural worker | 1442 | 65.9 |
| Service/business/professional | 634 | 29.0 |
| Mother occupation |  |  |
| Housewife/unemployed | 1815 | 83.0 |
| Labor/agricultural worker | 279 | 12.8 |
| Service/business/professional | 93 | 4.3 |
| Socioeconomic status* |  |  |
| Upper | 29 | 1.3 |
| Upper middle | 48 | 2.2 |
| Middle | 161 | 7.4 |
| Lower middle | 501 | 22.9 |
| Lower | 1448 | 66.2 |

*Modified BG Prasad Socioeconomic scale 2017
Depression was also found to be significantly higher among school-going adolescents whose mothers were educated up to primary (OR 3.19; 95\% CI 1.44-6.76;
$P<0.01$ ) or up to intercollege (OR 1.59; 95\% CI 1.23-2.06; $P<0.001$ ) when compared to illiterate mothers. Similarly, depression was found to be more among those adolescent girls whose fathers were educated up to intercollege (OR 1.29; 95\% CI 1.01-1.66; $P<0.05$ ) or were graduate and above (OR 1.58; 95\% CI 1.17-2.12; $P<0.001$ ), when compared with those whose fathers were illiterate [Table 3].

## DISCUSSION

About one-third of school-going adolescent girls were having depressive symptoms. The prevalence of depression was found to be $39.7 \%$. This is much higher compared with the findings of a preliminary study conducted in the same settings, in which the prevalence was found to be $18.7 \% .{ }^{[13]}$ The prevalence of depression we detected is also much higher when compared with other previous Indian studies. ${ }^{[17-19]}$ However, the prevalence is quite low when compared with the findings of Jha et al., Nagendra et al., Mohanraj et al., and Malik et al., where the prevalence of depression was reported between $50 \%$ and $60 \%$ among school-going adolescents. ${ }^{[20-23]}$ Also, a study conducted by Sandal et al. had found the combined prevalence of anxiety and depression to be about 57.65\% among school-going adolescents. ${ }^{[4]}$ Ganesh et al. had reported a much higher prevalence of $71.5 \% .{ }^{[24]}$ This disparity could be possibly due to the different methods used for the assessment of depression in these studies and the difference in the baseline variables of the study populations.

In this study, prevalence of depression was found to be two and a half times higher among early and mid-adolescent age group. However, it was just opposite to the findings of a preliminary study conducted in the same settings as well as other previous studies where the proportion of adolescents in older age group were having comparatively more probability of depression. ${ }^{[13,22,25,26]}$ Adolescence is a transition phase from childhood to adulthood. During initial stages of adolescence, especially among females, a number of physiological developmental changes take place. This high prevalence of depression indirectly reflects toward the neurobiological vulnerability among the adolescent girls and difficulties faced by them in coping with these changes during their period of transition from childhood to adulthood.

Prevalence of depression was also found to be about three times higher among adolescents belonging to rural areas. The finding was similar to that of a previous study conducted at Chandigarh by Singh et al. ${ }^{[27]}$ Meng et al. opine that adolescents from a rural background are more likely to have a poor family environment. This might

Table 2: Distribution of symptoms of depression among school-going adolescent girls during last week ( $n=2187$ )

| Symptoms of depression over past 1 week* | Hardly ever | Much of the time | Most of the time | All the time |
| :---: | :---: | :---: | :---: | :---: |
| Low mood, sadness, feeling blah or down, depressed, just cannot be bothered | 1495 (68.4) | 335 (15.3) | 311 (14.2) | 46 (2.1) |
| Irritable, losing your temper easily, feeling pissed off, losing it | 1464 (66.9) | 368 (16.8) | 295 (13.5) | 60 (2.7) |
| Sleep difficulties - different from your usual (over the years before you got sick): trouble falling asleep, lying awake in bed | 1349 (61.7) | 635 (29.0) | 188 (8.6) | 15 (0.7) |
| Feeling decreased interest in hanging out with friends; being with your best friend; being with your boyfriend/girlfriend; going out of the house; doing school work or work; doing hobbies or sports or recreation | 1549 (70.8) | 425 (19.4) | 191 (8.7) | 22 (1.0) |
| Feelings of worthlessness, hopelessness, letting people down, not being a good person | 1105 (50.5) | 889 (40.6) | 164 (7.5) | 29 (1.3) |
| Feeling tired, feeling fatigued, low in energy, hard to get motivated, have to push to get things done, want to rest or lie down a lot | 1647 (75.3) | 389 (17.8) | 142 (6.5) | 9 (0.4) |
| Trouble concentrating, cannot keep your mind on schoolwork or work, daydreaming when you should be working, hard to focus when reading, getting "bored" with work or school | 1352 (61.8) | 658 (30.1) | 161 (7.4) | 16 (0.7) |
| Feeling that life is not very much fun, not feeling good when usually (before getting sick) would feel good, not getting as much pleasure from fun things as usual (before getting sick) | 1601 (73.2) | 373 (17.1) | 187 (8.6) | 26 (1.2) |
| Feeling worried, nervous, panicky, tense, keyed up, anxious | 1581 (72.3) | 221 (10.1) | 324 (14.8) | 61 (2.8) |
| Physical feelings of worry like headaches, butterflies, nausea, tingling, restlessness, diarrhea, shakes or tremors | 1400 (64.0) | 552 (25.2) | 205 (9.4) | 30 (1.4) |
| Thoughts, plans, or actions about suicide or self-harm | 1594 (72.9) | 507 (23.2) | 79 (3.6) | 7 (0.3) |

Values in the parentheses () are row percentages. *Based on the items of Kutcher Depression Scale

Table 3: Univariate and multivariate analyses of the factors associated with depression among school-going adolescent girls

| Variables | Depression |  |  | Unadjusted OR (95\% CI) | $\begin{aligned} & \text { Adjusted OR } \\ & (95 \% \mathrm{CI}) \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Absent ( $n=1317$ ) | Present ( $n=870$ ) | Total ( $n=2187$ ) |  |  |
| Age category (years) |  |  |  |  |  |
| Early and mid-adolescents | 883 (67.0) | 626 (72.0) | 1509 (69.0) | 1.26 (1.04-1.52) | 2.5 (1.85-3.33) ${ }^{\text {\#\#\# }}$ |
| Late adolescents | 434 (33.0) | 244 (28.0) | 678 (31.0) | Reference |  |
| Religion |  |  |  |  |  |
| Non-Hindu | 299 (22.7) | 222 (25.5) | 521 (23.8) | 1.16 (0.95-1.42) | NA |
| Hindu | 1018 (77.3) | 648 (74.5) | 1666 (76.2) | Reference |  |
| Category |  |  |  |  |  |
| General | 473 (35.9) | 313 (36.0) | 786 (35.9) | 1.32 (1.03-1.70) | 1.13 (0.84-1.50) |
| Other Backward Class | 575 (43.7) | 423 (48.6) | 998 (45.6) | 1.47 (1.15-1.88) | 1.05 (0.79-1.38) |
| Scheduled Caste/Scheduled Tribe | 269 (20.4) | 134 (15.4) | 403 (18.4) |  | ence |
| Type of family |  |  |  |  |  |
| Joint | 710 (53.9) | 502 (57.7) | 1212 (55.4) | 1.16 (0.84-1.35) | NA |
| Nuclear | 607 (46.1) | 368 (42.3) | 975 (44.6) | Reference |  |
| Socioeconomic class* |  |  |  |  |  |
| Lower middle and above | 377 (28.6) | 362 (41.6) | 739 (33.8) | 1.77 (1.48-2.12) | 1.12 (0.90-1.40) |
| Lower | 940 (71.4) | 508 (58.4) | 1448 (66.2) | Reference |  |
| Residence |  |  |  |  |  |
| Rural | 707 (53.7) | 713 (82.0) | 1420 (64.9) | 3.91 (3.19-4.80) | 3.32 (2.60-4.25) ${ }^{\text {m\#\# }}$ |
| Urban | 610 (46.3) | 157 (18.0) | 767 (35.1) | Reference |  |
| Class |  |  |  |  |  |
| $6^{\text {th }}-8^{\text {th }}$ | 373 (29.8) | 264 (30.3) | 657 (30.0) | 1.29 (1.05-1.58) | 5.17 (3.65-7.30) ${ }^{\text {\#\#\# }}$ |
| $9^{\text {th }}-10^{\text {th }}$ | 277 (21.0) | 270 (31.0) | 547 (25.0) | 1.18 (1.51-2.32) | 3.10 (2.31-4.17) ${ }^{\text {m\#\# }}$ |
| $11^{\text {th }}-12^{\text {th }}$ | 647 (49.1) | 336 (38.6) | 983 (44.9) | Reference |  |
| Type of school |  |  |  |  |  |
| Private | 378 (28.7) | 395 (45.4) | 773 (35.3) | 2.06 (1.72-2.47) | 3.22 (2.32-4.54) ${ }^{\text {\#\#\# }}$ |
| Government/government-aided | 939 (71.3) | 475 (54.6) | 1414 (64.7) | Reference |  |
| Medium of instruction |  |  |  |  |  |
| Hindi | 843 (64.0) | 820 (94.2) | 1663 (76.0) | 9.22 (6.96-11.48) | 12.5 (8.33-20.0) ${ }^{\text {m\#\# }}$ |
| English | 474 (35.9) | 50 (5.7) | 524 (24.0) | Reference |  |
| Mother education |  |  |  |  |  |

Table 3: Contd...

| Variables | Depression |  |  | $\begin{aligned} & \text { Unadjusted } \\ & \text { OR (95\% CI) } \end{aligned}$ | $\begin{aligned} & \text { Adjusted OR } \\ & (95 \% \mathrm{CI}) \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Absent ( $n=1317$ ) | Present ( $n=870$ ) | Total ( $n=2187$ ) |  |  |
| Graduate and above | 13 (1.0) | 29 (3.3) | 42 (1.9) | 3.45 (2.00-5.95) | 1.06 (0.82-1.36) |
| Up to intercollege | 309 (23.5) | 261 (30.0) | 570 (26.1) | 1.89 (1.53-2.35) | 1.59 (1.23-2.06) ${ }^{\text {\#\#\#\# }}$ |
| Up to primary | 271 (20.6) | 201 (23.1) | 472 (21.6) | 1.83 (1.40-2.38) | 3.19 (1.44-6.76) ${ }^{\text {\#\# }}$ |
| Illiterate | 724 (55.0) | 379 (43.6) | 1103 (50.4) | Ref | ence |
| Father education |  |  |  |  |  |
| Graduate and above | 25 (1.9) | 35 (4.0) | 60 (2.7) | 4.26 (2.19-8.29) | 1.58 (1.17-2.12) ${ }^{\text {m\#\# }}$ |
| Up to intercollege | 637 (48.4) | 489 (56.2) | 1126 (51.5) | 1.61 (1.31-1.76) | 1.29 (1.01-1.66) ${ }^{\text {\# }}$ |
| Up to primary | 240 (18.2) | 178 (20.5) | 418 (19.1) | 1.41 (1.13-1.76) | 1.41 (0.75-2.66) |
| Illiterate | 415 (31.5) | 168 (19.3) | 583 (26.7) | Ref | ence |
| Father occupation |  |  |  |  |  |
| Unemployed | 62 (4.7) | 49 (5.6) | 111 (5.1) | 1.07 (0.71-1.62) | NA |
| Labor/agricultural worker | 889 (67.5) | 553 (63.6) | 1442 (65.9) | 0.85 (0.70-1.02) | NA |
| Service | 366 (27.8) | 268 (30.8) | 634 (29.0) | Ref | ence |
| Mother occupation |  |  |  |  |  |
| Unemployed/housewives | 1069 (81.2) | 746 (85.7) | 1815 (83.0) | 1.67 (1.27-2.20) | 1.32 (0.96-1.80) |
| Service | 51 (3.9) | 42 (4.8) | 93 (4.3) | 1.97 (1.22-3.20) | 1.06 (0.61-1.83) |
| Labor/agricultural worker | 197 (15.0) | 82 (9.4) | 279 (12.8) | Ref | ence |
| Outdoor physical activity |  |  |  |  |  |
| More than 3 hours a week | 655 (49.7) | 468 (57.3) | 1123 (51.3) | 1.19 (0.99-1.40) | NA |
| Less than 3 hours a week | 662 (50.2) | 402 (46.2) | 1064 (48.6) | Ref | ence |
| Watching television and engagement in social media |  |  |  |  |  |
| More than 2 hours per day | 625 (47.4) | 446 (51.2) | 1071 (48.9) | 1.16 (0.98-1.38) | NA |
| Less than 2 hours per day | 692 (52.5) | 424 (48.7) | 1116 (51.0) | Ref | ence |

Values in parentheses () are column percentages, *Modified BG Prasad Socioeconomic scale 2017, ${ }^{* \# \#} P<0.001,{ }^{\# \#} P<0.01,{ }^{\#} P<0.05$. OR: Odds Ratio; CI: Confidence Interval; NA: Not Applicable
be the reason for the higher prevalence of depression among rural adolescent girls. ${ }^{[28]}$

In line with the findings reported by Shelke et al., ${ }^{[17]}$ in this study too, adolescents studying in lower classes ( $6^{\text {th }}-10^{\text {th }}$ ) were found to be having more depressive symptoms. However, no such association has been observed in other previous studies. ${ }^{[13,17,27,29]}$ In contradiction to that, some other previous studies had reported more depressive symptoms among students studying in higher standards and had accounted it to academic pressure. ${ }^{[4,3,3,31]}$

In contradiction to the findings reported by Singh et al., ${ }^{[27]}$ depression was found to be three times higher among adolescents studying in private schools. This might be attributed to the fact that in Indian scenario, the study culture is more competitive and hectic in private schools when compared with government ones, which thereby leads to stress among students, and on a long-term it may indirectly lead to depression.

A major finding of this study was that adolescent girls studying in Hindi medium schools were about 12 times more preponderate for depression. This finding indirectly reflects the intervening thoughts in the mindsets of these individuals studying in Hindi medium toward prospects in a future career where the

English language has a major role in the upcoming competitive environment.

The results also showed that adolescents with more educated parents were at a higher risk of depression. This finding is contradictory to the results of previous studies where no such association has been observed. ${ }^{[13,27]}$ The finding could be attributed to the fact that educated parents have a higher expectation from their children. Apart from that, they often try to indulge their children more toward academic activities, and often, much of their time of enjoyment/recreational activities get reduced. Second, when compared with educated parents who are often continuously involved in some jobs/outdoor activities, the illiterate parents are more available to their children to share their thoughts, feelings, and free talks, thereby reducing the risk of depression.

Almost majority of the studies in Indian and Asian setup had reported a significant association between socioeconomic status and depression. ${ }^{[4,13,17,29,32,33]}$ However, no such association has been found in our study. This could be explained by the fact that although socioeconomic status has a high impending impact on cognitive and behavioral domains of adolescents, the effect of this individual-level factor could be suboptimized or nullified by other
predominant intervening factors such as parental education, occupation, and other basic background characteristics.

The study findings should be interpreted in the light of some limitations. Since the study was conducted in the schools of only one district of Uttar Pradesh and was cross-sectional in nature, the generalizability is limited and temporal associations could not be established. Apart from that, the diagnosis could not be confirmed from psychiatrists due to feasibility issues. But, besides these limitations, the study was the first of its kind in Barabanki district of Uttar Pradesh and provides a gross reflection about the mental health status of girls in adolescent age group. However, an utmost important factor, that is, the psychosocial environment of the homes, such as parental fights and beating of children by parents, was not explored due to lack of permission from a majority of the concerned school authorities.

## CONCLUSION

Adolescent girls are quite preponderated toward the risk of depression. Planned interventions directly targeting the significant predictors would help deal with the problem in a more comprehensive way. Strengthening of routine school health check-ups and implementation of school-based mental health screening programs are the needs of the hour. There is also a need to make the parents understand that their role is of utmost importance from a prevention point of view. Apart from that, the school teachers, parents, and community health workers should coordinate as a team so as to identify any sort of depressive symptoms in a timely manner and seek proper health care if required.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

## REFERENCES

1. Adolescence - An Age of Opportunity. UNICEF India. Press release. Available from: http://unicef.in/PressReleases/87/ Adolescence-An-Age-of-Opportunity. [Last accessed on 2018 Apr 14].
2. Adolescent health and development. Child and adolescent health and development. World Health Organization. Available from: http://www.searo.who.int/entity/child_ adolescent/topics/adolescent_health/en/. [Last accessed on 2018 Mar 13].
3. Youth in India 2017. Central Statistics Office Ministry of Statistics and Programme Implementation Government of India (Social Statistics Division). Available from: http:// mospi.nic.in/sites/default/files/publication_reports/Youth_ in_India-2017.pdf. [Last accessed on 2018 Mar 12].
4. Sandal RK, Goel NK, Sharma MK, Bakshi RK, Singh N, Kumar D. Prevalence of depression, anxiety and stress among school going adolescent in Chandigarh. J Family Med Prim Care 2017;6:405-10.
5. Kessler RC, Conagle KA, Zhao S. Lifetime and 12 month prevalence of DSM-III-R psychiatric disorders in the United States. Arch Gen Psychiatry 1994;51:8.
6. Thapar A, Collishaw S, Pine DS, Thapar AK. Depression in adolescence. Lancet 2012;379:1056-67.
7. Lopez AD, Murray CC. The global burden of disease, 1990-2020. Nat Med 1998;4:1241-3.
8. Copeland JR, Beekman AT, Dewey ME, Hooijer C, Jordan A, Lawlor BA, et al. Depression in Europe. Geographical distribution among older people. Br J Psychiatry 1999;174:312-21.
9. Compass BE, Oppedisano G, Connor JK. Gender differences in depressive symptoms in adolescence: Comparison of national samples of clinically referred and youths. J Consult Clinical Psychol 1997;65:617-26.
10. Breslau N, Peterson EL, Shultz LR, Chilcoat HD, Andreski P. Major depression and stages of smoking. A longitudinal investigation. Arch Gen Psychiatry 1998;55:161-6.
11. Olson AL, Kelleher KJ, Kemper KJ, Zuckerman BS, Hammond CS, Dietrich AJ. Primary care pediatricians' roles and perceived responsibilities in the identification and management of depression in children and adolescents. Ambul Pediatr 2001;1:91-8.
12. Weissman M, Wolk S, Goldstein RB. Depressed adolescents grown up. J Am Med Assoc 1999;281:1707-13.
13. Shukla NK, Shukla M, Ahmad S, Shukla R, Khan Z. A cross-sectional study on depression among school going adolescent girls in Barabanki district, Uttar Pradesh, India. Int J Contemp Pediatr 2017;4:178-81.
14. Lwanga, SK. Sample size determination in health studies' a practical manual, 1991. Available from: http://www.tbrieder. org/publications/books_english/lemeshow_samplesize. pdf. [Last accessed on 2018 Mar 08].
15. LeBlanc JC, Almudevar A, Brooks SJ, Kutcher S. Screening for adolescent depression: Comparison of the Kutcher Adolescent Depression Scale with the Beck Depression Inventory. J Child Adolesc Psychopharmacol 2002;12:113-26.
16. Zhou H, Hao N, Du Y, Liu Y, Sui Y. Reliability and validity of the Eleven Item Kutcher Adolescent Depression Scale, Chinese Version (KADS-11CV). J Child Adolesc Behav 2016;4: 308-13.
17. Shelke U, Kunkulol R, Phalke VD, Narwane SP, Patel P. Study of depression among adolescent students of rural Maharashtra and its association with socio-demographic factors: A cross-sectional study. Int J Med Res Health Sci 2015;4:41-5.
18. Nair MK, Paul, MK, John R. Prevalence of depression among adolescents. Indian J Pediatr 2004;71:523-4.
19. Bhatia SK, Bhatia SC. Childhood and adolescent depression. Am Fam Physician 2007;75:73-80.
20. Jha KK, Singh SK, Nirala SK, Kumar C, Kumar P, Aggrawal N. Prevalence of depression among school-going adolescents in an Urban Area of Bihar, India. Indian J Psychol Med 2017;39:287-92.
21. Nagendra K, Sanjay D, Gouli C, Kalappanavar NK, Vinod Kumar CS. Prevalence and association of depression and suicidal tendency among adolescent students. Int J Biomed Adv Res 2012;3:714-9.
22. Mohanraj R, Subbaiah K. Prevalence of depression among urban adolescent in South India. J Indian Assoc Child Adolesc Ment Health 2010;6:33-43.
23. Malik M, Khanna P, Rohilla R, Mehta B, Goyal A. Prevalence of depression among school going adolescents in an urban
area of Haryana, India. Int J Community Med Public Health 2015;2:624-6.
24. Ganesh M, Sridevi SA. A study on the prevalence of depression and eating disorder among females of fertile age group in Chennai. Int J Develop Res 2014;4:2315-8.
25. Brian C, David J, Lan DR, Stove M, Edward GB. The prevalence of depression in a high school population. Adolescence 1993;28:149-58.
26. Baron P, Perron H. Sex differences in the beck depression inventory scores of depression. J Youth Adolescence 1986;15:165-71.
27. Singh MM, Gupta M, Grover S. Prevalence \& factors associated with depression among school going adolescents in Chandigarh, north India. Indian J Med Res 2017;146:205-15.
28. Meng H, Li J, Loerbroks A, Wu J, Chen H. Rural/urban background, depression and suicidal ideation in Chinese college students: A cross-sectional study. PLoS One 2013;8:e71313.
29. Chen L, Wang L, Oiu XH, Yang XX, Oiao ZX. Depression among Chinese University students: Prevalence and socio-demographic correlates. PLoS ONE 2013;8:e58379.
30. Deb S, Strodl E, Sun J. Academic stress, parental pressure, anxiety and mental health among Indian high school students. Int J Psychol Behav Sci 2015;5:26-34.
31. Bhasin SK, Sharma R, Saini NK. Depression, anxiety and stress among adolescent students belonging to affluent families: A school-based study. Indian J Pediatr 2010;77:161-5.
32. Sarkar J, Sen Gupta P, Manna N, Saren AB, Chattopadhyay S, Mundle M. Depressive symptoms among undergraduate Medical students: Study from a Medical college in Kolkata, India. J Dent Med Sci 2013;4:13-8.
33. Mojs E, Warchoł BK, Głowacka MD, Strzelecki W, Ziemska B, Marcinkowski JT. Are students prone to depression and suicidal thoughts? Assessment of the risk of depression in university students from rural and urban areas. Ann Agric Environ Med 2012;19:770-4.

## New features on the journal's website

## Optimized content for mobile and hand-held devices

HTML pages have been optimized of mobile and other hand-held devices (such as iPad, Kindle, iPod) for faster browsing speed.
Click on [Mobile Full text] from Table of Contents page.
This is simple HTML version for faster download on mobiles (if viewed on desktop, it will be automatically redirected to full HTML version)

## E-Pub for hand-held devices

EPUB is an open e-book standard recommended by The International Digital Publishing Forum which is designed for reflowable content i.e. the text display can be optimized for a particular display device.
Click on [EPub] from Table of Contents page.
There are various e-Pub readers such as for Windows: Digital Editions, OS X: Calibre/Bookworm, iPhone/iPod Touch/iPad: Stanza, and Linux: Calibre/Bookworm.

## E-Book for desktop

One can also see the entire issue as printed here in a 'flip book' version on desktops.
Links are available from Current Issue as well as Archives pages.
Click on View as eBook


[^0]:    This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercialShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

    For reprints contact: reprints@medknow.com

    How to cite this article: Shukla M, Ahmad S, Singh JV, Shukla NK, Shukla R. Factors associated with depression among school-going adolescent girls in a District of Northern India: A cross-sectional study. Indian J Psychol Med 2019;41:46-53.

[^1]:    Department of Community Medicine, Hind Institute of Medical Sciences, Safedabad, Barabanki, ${ }^{1}$ MBA Department, Institute of Engineering and Technology, Lucknow, Uttar Pradesh, India

    Address for correspondence: Dr. Mukesh Shukla
    96-HA Vihar, Panigaon, Indiranagar, Lucknow - 226 016, Uttar Pradesh, India. E-mail: drmukeshshukla@gmail.com

