Depression is one of the leading causes of poor school performance. It can be associated with learning problems, school dropouts, delinquency, or sexual promiscuity. Depression in adolescence may also manifest with drug and alcohol abuse, excessive risk-taking behaviors, phobias, panic, and eating disorders. Depression is a major risk factor for suicide in adolescents.

Adolescence is a critical period for developmental from a bio-psycho-social perspective. An adolescent develops a sense of self and social identity through stable relationships and takes major career decisions. Adolescent depression can interfere with INTRODUCTION

Depressive disorders occur in children of all ages but are more prevalent with increasing age and are significantly higher in teenagers as compared to younger children.[1-3] Adolescence, the transition period from childhood to adulthood is marked by emotional instability and rapid physical and social changes. These can be associated with emotional disturbances, depression, and anxiety disorders. Studies show that childhood anxiety may predict the development of adult depression in both men and women.[4]

ABSTRACT

Background: Understanding the prevalence of a psychiatric disorder among children is essential for formulating sound public health policy. Aim: This study is aimed to estimate the prevalence of depression in urban school-going adolescents and its association with age, sex, and birth order. Materials and Methods: A total of 500 participants in the age group 12–16 years from a working-class community, studying in an urban school, were selected for the study. The children with a score greater than or equal to 19 on the CDI scale were taken for the second phase, and diagnosis of depression was confirmed by a psychiatric consultant through a clinical interview. In clinically diagnosed cases, all help was rendered, including follow-up. Results: The prevalence of clinical depression among school-going children of age group 12–16 years was 8.4%. There was no significant gender difference in the prevalence of clinical depression. Significantly, more children had clinical depression in the age group of 14–16 years than in the 12–14 years of age group. Depressive symptoms were more among children with first birth order. Conclusions: These results show that depression is common in school-going urban adolescents in India and highlight the need for screening school-age children for depression so that early intervention can be provided.

INTRODUCTION

Depression is one of the leading causes of poor school performance. It can be associated with learning problems, school dropouts, delinquency, or sexual promiscuity.[5] Depression in adolescence may also manifest with drug and alcohol abuse, excessive risk-taking behaviors, phobias, panic, and eating disorders.[6,7] Depression is a major risk factor for suicide in adolescents.[8] Adolescence is a critical period for developmental from a bio-psycho-social perspective. An adolescent develops a sense of self and social identity through stable relationships and takes major career decisions. Adolescent depression can interfere with

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the successful acquisition of skills needed for stable and productive adulthood.\cite{9,13}

Depressive disorders in children, adolescents, and adults are similar phenomenological entities, and studies have shown that the same diagnostic criteria can be reliably applied to these three age groups.\cite{11,15}

Varied prevalence rates have been reported for depression in children and adolescents. Such variations may result from differences in the study population, sample sizes, diagnostic criteria, and interviewing techniques. In community studies, point prevalence of major depressive disorder in adolescents has been estimated to be 0.1%–8% in Indian studies and 0.2%–17% in Western literature.\cite{13,14} School based studies report a higher prevalence than community studies. Almost all studies report a higher prevalence among adolescents than children.

An epidemiological study from Brazil using the Children’s Depression Inventory (CDI) with a cut-off score of 19 reported significant depressive symptoms in 20.2% of students aged 10–17 years.\cite{17} There was a significant predominance of females, nonsignificant trend of increasing rates of depressive symptoms from 10 to 15 years, and a decreasing trend in ages 16–17 years. A cross-sectional study in Turkey, using Children Beek Depression Inventory (BDI) (cutoff point: 19), reported prevalence of depression at 12.55% among school students (6th–11th grades) with a significantly higher prevalence in girls than boys.\cite{18} A school based study (14–20 years) in Trinidad (West Indies) using the Reynolds Adolescent Depression Scale found the prevalence of depression to be 8.2% in males and 17.9% in females, respectively.\cite{19}

Indian studies on the prevalence of childhood depression have reported results ranging from 0.48% to 49.2%.\cite{20,21} In India, the National Mental Health Survey (2015–2016) reported a prevalence rate of 0.8% for depression in 13–17-year age group.\cite{20} World Health Organization in Global school-based student health surveys reported that in India (in 2007), 24.6% of 13–15 years old students felt so depressed or hopeless almost daily for 2 or more weeks in the past year that they stopped doing their usual activities.\cite{20} Nair et al. assessed school-going adolescents (13–19 years) using BDI and observed that 22.4% of girls and 12.8% of boys had depression of various grades.\cite{21} Bansal et al. reported the prevalence of depression of 18.4% using a BDI cut-off score of 12, among students in 9th standard in a public school.\cite{22}

Depression being an internalized disorder, is difficult to detect. The subject looks healthy, does not show externalized behavior and is, therefore, not shown to a mental health professional. Depression in adolescence substantially increases the risk of developing recurrent depression in later life.\cite{23,24} Identification of depression in children and adolescents can ensure early and appropriate secondary preventive interventions to reduce morbidity and long-term consequences. Knowledge of the prevalence of adolescent depression can inform policymakers about the magnitude of the problem and guide them in resource allocation for early intervention programs. Keeping this in mind, the present study was undertaken to estimate the prevalence of depression in school-going children in an urban population in the age group of 12–16 years.

**MATERIALS AND METHODS**

A cross-sectional study design was adopted. Approval of the Ethics Committee of the Institution was obtained before conducting the study. The study was conducted in a large school in Pune. Informed consent of the parents was taken during parent-teacher meetings. The scope and benefit of the study were explained to them. Names of the school and students were kept confidential. Most parents were from a working middle-class background. An effort was made to interview the family together in one sitting. Close relatives like the grandparents were also accepted as informants. The interviewing was carried out at the Child Guidance Clinic of a tertiary care hospital.

**Inclusion criteria**

(a) Age: 12–16 years (b) Could read, write, and understand English (c) had been studying in the school for >6 months.

**Exclusion criteria**

Those whose parents did not report in any of the three parents–teachers meetings especially organized preceding this study (for imparting information and taking consent) were excluded from the study.

Out of 561 registered students, 500 (Male = 323, Female = 177) were finally selected for the study. The major cause of exclusion was that the informed consent of the parents could not be taken. The study was conducted in 2 phases.

**Statistical analysis**

Descriptive statistics were applied to obtain the means and frequencies of sociodemographic and clinical data of the sample. Unpaired *t*-test was used to compare the means between two groups. The Chi-square test of independence was used to determine if there was a significant association between two categorical variables.

**First phase: Screening**

The Children’s Depressive Inventory (CDI), was administered.\cite{25,26} The CDI is a 27-item self-report scale.
that is symptom-oriented. Twelve teachers took part in the screening process. The questionnaire was explained to the teachers. A copy of CDI was given to each child. An administrator read the questions aloud, while students read along silently on their copy and marked the answers. This was done to assist children with reading or attention problems.

Second phase

Children with a score of 19 or more were considered for the second phase. Their parents were contacted. A diagnosis of depression was confirmed by a psychiatric consultant through a clinical interview.

RESULTS

Of the 500 students in the study sample 323 (64.6%) were male and 177 (35.4%) were female. Of the total study sample, 74 (14.80%) were of age group 12–13 years, 153 (30.60%) were of age group 13–14 years, 131 (26.20%) were of age group 14–15 and 142 (28.40%) were of age group 15–16 years.

In the first phase, 54 students screened positive for depression (score of 19 or more on CDI) of which 36 (11%) were boys and 18 (10%) were girls. There was no significant association between gender and screened positive students [Table 1].

The 54 children who screened positive were interviewed by a psychiatrist who was blinded to the CDI score. Diagnosis of clinical depression was confirmed by DSM IV-TR criteria for depression in children. Out of 54 screened positive students, 42 had clinical depression, whereas 12 students had subsyndromal depressive symptoms. Among the screened positive students, mean CDI score of those with definite clinical depression was significantly higher than those with subsyndromal depression [Table 2].

The gender distribution of clinically depressed cases is given as per Table 3. Out of 323 males, 28 (8.67%) were diagnosed with clinical depression and 14 out of 177 females (7.91%) were found clinically depressed. There was no significant association between gender and clinical depression [Table 3].

There was a significant association between age and clinical depression [Table 4]. The percentage of students with clinical depression was highest (12.7%) in 15–16 years age group and tapered down to 9.9% in 14–15 years old, 5.9% in 13–14 years old to a low of 2.7% in the youngest group considered (12–13 years).

There was also a significant association between birth order and Clinical Depression. Fifty percent (21 of 42) depressed students were firstborn or only child, 19 were second born, and two were 3rd born [Table 5].

DISCUSSION

Depression in adolescence differs from that in middle childhood in certain important aspects. Therefore, there was a need to restrict the sample to one age group to eliminate the need to make age corrections. Such a restriction has the limitation that the findings may only be applied to that age group. Most earlier Indian studies have either taken a narrower range of 8–10 years and 9–11 years or a broader range of 0–16 years and 4–11 years.27–29 Only a few studies have taken age range keeping the target population exclusively as adolescent school children. The age group of 12–16 was considered as ideal as it covered

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**Table 1: Children’s depression inventory score and gender distribution of students in study group**

| CDI score | Boys (%) | Girls (%) | Total (%) |
|-----------|----------|-----------|-----------|
| <19       | 287 (88.85) | 159 (89.83) | 446 (89.2) |
| ≥19       | 36 (11.15) | 18 (10.17) | 54 (10.8) |
| Total     | 323 (100) | 177 (100) | 500 (100) |

**Table 2: Comparison of mean children’s depression inventory score in clinically depressed children with children not found clinically depressed in those scoring above cutoff**

| Clinical depression (mean±SD) | Present (n=42) | Absent (n=12) | t | P |
|-------------------------------|----------------|--------------|---|---|
| CDI score                     | 23.90±3.89    | 20.00±0.95   | 3.42 | 0.005 |

**Table 3: Gender and clinical depression in study group**

| Sex | Clinical depression (%) | No clinical depression (%) | Total (%) |
|-----|-------------------------|---------------------------|-----------|
| Male | 28 (8.67) | 295 | 323 (100) |
| Female | 14 (7.91) | 169 | 177 (100) |
| Total | 42 (8.4) | 458 (91.6) | 500 (100) |

**Table 4: Association of age and clinical depression**

| Age | Clinical depression (%) | No clinical depression (%) | Total |
|-----|-------------------------|---------------------------|-------|
| 12-14 | 12 (5.3) | 215 (94.7) | 227 (100) |
| 14-16 | 30 (11) | 243 (89) | 273 (100) |
| Total | 42 (8.4) | 458 (91.6) | 500 (100) |

\[\chi^2=1.87; P>0.05\]

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Table 5: Birth order and clinical depression in study group

| Birth order | Depression | Total (%) |
|-------------|------------|-----------|
|             | Present (%) | Absent (%) |     |
| 1           | 21 (14.38)  | 125 (85.62) | 146 (100) |
| 2           | 19 (10.16)  | 168 (98.8)  | 187 (100)  |
| 3           | 2 (1.2)     | 165 (98.8)  | 167 (100)  |
| Total       | 42 (8.4)    | 458 (91.6)  | 500 (100)  |

\( \chi^2 = 18.80, P < 0.05 \)

the maximum proportion of the adolescent population in schools.

This study showed no significant gender difference in the prevalence of depression. This is in contrast to most other studies which have reported a higher prevalence of depression in girls than in boys with the ratio approaching the adult ratio of 2:1 in late adolescence. However, a community study by Mishra et al. in Uttar Pradesh using similar methodology also reported no significant gender difference in the adolescent population in the age group of 11–18 years. A prospective, 10-year longitudinal study of gender differences in depressive symptoms from preadolescence to young adulthood revealed that while small gender differences are present between the ages of 13 and 15 years, the greatest difference was between 15 and 18 years. Since our sample was in the age group of 12–16 year, it is possible that gender difference had not yet manifested. Depression in adolescent girls has been linked primarily to female hormonal changes than to chronological age. Since the onset of puberty in Indian girls is often later than those in developed nations, it is possible that the gender difference in the prevalence of depression also occurs later. Further studies are needed with older adolescents up to the age of about 19 years to test this hypothesis.

There was a significant association between age and clinical depression. While 5.3% of students in the age group of 12–14 years had clinical depression, 11% of those in 14–16 years age group were clinically depressed. This is in agreement with other studies and reviews, which report that the prevalence of depression increases with age during adolescence.

We also found an association between birth order and depression with a significantly higher prevalence of clinical depression among the firstborn or only children. Adler had hypothesized that firstborn children are more competitive and prone to neurosis and depression that later-born ones. Our results seem to be in agreement with this hypothesis, although other studies have found no association between birth order and depression in adolescents. Some have even reported a higher rate of depression in middle or last-born children. It has been hypothesized that the eldest child is introduced to the economic or social responsibilities at an early age, thus predisposing him/her to psychological problems. In India, the eldest male child is expected to bear the economic or social responsibilities of the joint family. This fact is instilled at an early age. This may increase the stress and predispose him to psychological problems.

Because of limited trained workforce, we restricted the sample size to 500. A larger sample would have increased the power of study with better generalizability. The selected age group (12–16 years) also limits any extrapolation of our findings to other age groups in the population. The subjects were primarily from upper and middle-class backgrounds; therefore, including subjects from lower socioeconomic backgrounds would have led to more realistic and comprehensive conclusions.

CONCLUSIONS

In this study, the overall prevalence rate of clinical depression was 8.4%. School mental health is a neglected area in our country, and only a small fraction of these cases would have come to attention or received appropriate intervention under normal circumstances. Our findings highlight the need to have a structured school mental health program for the promotion of mental health and early intervention in cases with childhood depression.

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Conflicts of interest
There are no conflicts of interest.

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