

## Depression in Children and Adolescents: A Review of Indian studies

Sandeep Grover, Venkatesh Raju V, Akhilesh Sharma, Ruchita Shah

### ABSTRACT

**Background:** Depression is a common mental disorder seen across all age groups, including children and adolescents. Depression is often associated with significant disability in children and adolescents. **Aim:** This review aims to evaluate the Indian research on depression in children and adolescents. **Results:** Available data suggest that the point prevalence of depression/affective disorders ranges from 1.2% to 21% in the clinic-based studies; 3%–68% in school-based studies and 0.1%–6.94% in community studies. There has been only one incidence study from India which estimated the incidence to be 1.6%. With respect to the risk factors for depression, studies have reported various education-related difficulties, relationship issues with parents or at home, family-related issues, economic difficulties, and other factors. A limited number of studies have evaluated the symptom profile, and the commonly reported symptoms include depressed mood, diminished interest in play activities, concentration difficulties, behavior problems in the form of anger and aggression, pessimism, decreased appetite, decreased sleep, anhedonia, and somatic symptoms. None of the studies from India has evaluated the efficacy/effectiveness of various antidepressants in children and adolescents with depression. **Conclusion:** There is a wide variation in the point prevalence reported across different studies, which is mainly due to methodological differences across studies. Limited data are available with respect to symptom profile and factors associated with depression in children and adolescents.

**Key words:** Children and adolescents, depression, epidemiology, prevalence


Depression is a common illness worldwide, occurring in all age groups, including infants.<sup>[1]</sup> According to the estimates of the World Health Organization, 322 million people, amounting to 4.4% of the world population, suffer from depression.<sup>[2]</sup> Depression is one of the leading causes of disease burden worldwide and is ranked as the second

leading cause of disability. It is also considered as a major contributor to the global burden of diseases.<sup>[3,4]</sup> Over the years, it is recognized that the age of onset of depression is decreasing, and it is now increasingly being recognized

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Department of Psychiatry, Post Graduate Institute of Medical Education and Research, Chandigarh, India

**Address for correspondence:** Dr. Sandeep Grover  
Department of Psychiatry, Post Graduate Institute of Medical Education and Research, Chandigarh, India.  
E-mail: drsandeepg2002@yahoo.com

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in children and adolescents.<sup>[5]</sup> Although a large amount of data are available for depression in children and adolescents from various parts of the world, there are limited data from India. This article attempts to collate the information regarding epidemiology, clinical features, risk factors/life events, symptom profile, and comorbid disorders seen in children and adolescents with depression in India. For this review, a thorough Internet search using search Engines of PubMed, Google Scholar, and Science Direct was carried out. The keywords, used in different permutations and combinations, included the following: depression, depress\*, children, adolescents, adolescen\*, treatment, treat\*, antidepressants, antidepress\*, intervention, management, India, symptoms, comorbidity, comorbid\*, prevalence, and epidemiology.

We did not include studies which specifically evaluated depression in children and adolescents with specific physical illnesses. This review also does not cover data specific to mania or bipolar disorders in children and adolescents. Similarly, data pertaining to depression in children and adolescents published as case reports or case series were excluded.

Available data have been organized to understand the epidemiology, risk factors/life events associated with the development of depression, symptom profile, comorbidity, and intervention studies.

## EPIDEMIOLOGY OF DEPRESSION IN CHILDREN AND ADOLESCENTS

Studies which have evaluated the point prevalence of depression among children and adolescents can

be categorized as clinic-based, school-based, and community-based.

### Clinic-based studies

Clinic-based studies have mostly followed retrospective design, in which data of children registered in various child guidance clinics or child and adolescent psychiatry services have been analyzed for evaluating the clinic prevalence of various psychiatric disorders. Some of these studies have given the clinic prevalence of depression, and others have given data for the point prevalence of affective disorders.<sup>[6-13]</sup> The age group has varied in different studies, and the usual range has been 0–18 years. The sample size of these studies has varied from 100 to 6109, and most of these studies have relied on the International Classification of Diseases (ICD) system (9<sup>th</sup> or 10<sup>th</sup> revision) for making the diagnosis. The prevalence of depression/affective disorders in these studies has varied from 1.2% to 21% [Table 1]. One study from Chandigarh evaluated the data of all the children and adolescents visiting the clinic and looked at the time trends of clinic prevalence of depression/affective disorders.<sup>[9]</sup> This study showed that during the decade of 1980–1989, the clinic prevalence of affective disorders was 2%, which increased to 6.6% during the decade of 1990–1999 and which further increased to 13.49% from 2000 to 2006. Although these clinic-based studies provide useful clinical data with respect to the prevalence of depression, they do not reflect the actual point prevalence of depression in the community-based population, as it is well-known that a significant proportion of patients with various psychiatric disorders do not seek consultation. Furthermore, most of these studies have come from large tertiary care hospitals

**Table 1: Prevalence of depression in children and adolescent in clinic-based studies**

Author	Study design	Study site	Sample size	Age range of participants in years	Sampling period	Instrument used	Point prevalence
Malhotra and Chakrabarti <sup>[6]</sup>	Retrospective study	Chandigarh			Screening of records 1984-1988	No specific instrument used, ICD-9 diagnosis	1.2%
Chadda and Saurabh <sup>[7]</sup>	Retrospective study	New Delhi	386	0-13	All children (13 years or below) who attended OPD from Jan 1991 to Dec 1992	No specific instrument used, ICD-9 diagnosis	3.4%
Sidana <i>et al.</i> <sup>[8]</sup>	Retrospective	Delhi	300	2-12	1994-1996	ICD-10	6%
Malhotra <i>et al.</i> <sup>[9]</sup>	Retrospective	Chandigarh	6109	0-15	1989-2005	ICD-9/10	1980-89: 2% 1990-99: 6.6% 2000-05: 13.49%
Sagar <i>et al.</i> <sup>[10]</sup>	Retrospective study	New Delhi	930	<16	June 2008-May 2010	No specific instrument used, semi-structured datasheet, DSM-IV diagnosis	Mood disorder: 4.1% Depression: 2.9% Bipolar: 1.2%
Solanki and Rastogi <sup>[11]</sup>	Retrospective study	Sagar/Indore, Madhya Pradesh	175	0-16	Jan-Aug 2014	ICD-10	4%
Chakraborty and Bandyopadhyay <sup>[12]</sup>	Retrospective study	Joka, West Bengal	100	1-12	Not available	DSM-5	4%
Vivek and Nimish <sup>[13]</sup>	Retrospective study	Meerut	100	6-18	Jan 2016-2017	ICD-10 and MINI-KID	21%

ICD–International Classification of Diseases; DSM–Diagnostic and Statistical Manual of Mental Disorders; OPD–Outpatient Department

located in the urban locality, whereas the majority of the Indian population reside in rural areas. Hence, though these studies provide useful information, they are not reflective of the trends in the larger community.

### School-based studies

In the recent one decade or so, there has been a proliferation of school-based studies which evaluated the point prevalence of depression in school-going children and adolescents.<sup>[14-16]</sup> These cross-sectional studies have mostly evaluated the participants by scales used to quantify depression, such as Beck Depression Inventory (BDI), Patient Health Questionnaire-9 (PHQ-9), Centre for Epidemiological Studies – Depression (CES-D), Depression Anxiety and Stress (DAS) scale, or self-designed questionnaires. The school-based studies have mostly come from urban areas, with occasional studies evaluating the students from rural schools, and one study evaluating students from tribal areas. However, very few studies either used two-stage sampling method, which involves the initial use of screening instrument, followed by evaluation of the patient on structured clinical interviews such as Mini-International Neuropsychiatric Interview for Children and Adolescents (MINI-KID), or Kiddie Schedule for Affective Disorders and Schizophrenia, or used semi-structured interview to evaluate the participants on Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV or ICD-10 criteria [Table 2].<sup>[17-37]</sup> A few studies have directly evaluated the participants on structured clinical interviews such as MINI-KID. One of the studies also included school dropouts while evaluating the point prevalence of depression. Studies that were based on the use of screening instruments, such as rating scales, have usually reported a point prevalence rate of depression ranging from 3% to 68%, with a majority of the studies reporting the point prevalence of depression to be >40%.<sup>[17-25,27,29,31,32,34,37]</sup> Studies that used structured instruments have reported relatively lower point prevalence rates, ranging from 2.33% to 25%.<sup>[26,28,30,33,35,36]</sup>

These findings clearly suggest that one-stage screening of participants using a rating scale usually overestimates the point prevalence of depression.<sup>[17-25,27,29,31,32,34,37]</sup> The study that compared urban, rural, and tribal school students showed that major depressive disorders were more prevalent in students from the urban locality (4.1%), whereas point prevalence was 3.5% in the rural high school students and it was lowest in the participants from tribal schools.<sup>[33]</sup> Another study which included school dropouts too reported significantly higher point prevalence rate for affective disorders among school dropout girls (59%), compared with school-going girls (20.3%) and boys (9.33%), irrespective of their school status.<sup>[18]</sup>

### Community-based studies

There are many community-based studies that evaluated the point prevalence of depression or psychiatric disorders in different age groups.<sup>[38-56]</sup> However, there are a limited number of studies that specifically focused on children and adolescents.<sup>[38-45]</sup> Most studies focused on any age group and included children and adolescents too in the process and did not provide specific point prevalence data for depression in children and adolescents.<sup>[46-56]</sup> Nandi *et al.* provided data on point prevalence of psychiatric disorders in a rural population from West Bengal and reported lack of depression in children and adolescents.<sup>[38-40]</sup> In a study from Bengaluru, multiple instruments were used to screen for various psychiatric disorders; ICD-10 Diagnostic Criteria for Research were used to ascertain psychiatric morbidity, and two-stage screening was used. The study included 2064 children and adolescents, age 0–16 years. Psychiatric morbidity was reported to be 12.5%, with the point prevalence of depression being 0.1%, all of which was seen in children and adolescents from an urban locality.<sup>[42]</sup> The recently completed National Mental Health Survey (NMHS), which used two-stage screening, reported the point prevalence of mental morbidity to be 7% among adolescents age 13–17 years, with depressive disorders (first episode, recurrent depression) being the most common morbidity with a point prevalence rate of 2.6%.<sup>[57]</sup> Another community-based survey, which included youth age 15–24 years from Himachal Pradesh, reported the point prevalence of depression to be 6.94%. However, it is important to note that in this study, depression was ascertained using a few questions covering the following features: loss of appetite, sleep disturbance, feeling apathy, feeling worthless, and lack of interest in daily activities and work.<sup>[44]</sup> Another study which evaluated 257 children and adolescents age 5–14 years from slum population in Mumbai on DSM-IV criteria reported the point prevalence of major depression to be 0.4%.<sup>[43]</sup> [Table 3].

## INCIDENCE OF DEPRESSION

In contrast to point prevalence studies, only one study from India has evaluated the incidence of childhood-onset psychiatric disorders among those age 4–11 years.<sup>[58]</sup> This study reported the incidence of depression to be 1.6%.<sup>[58]</sup>

## FACTORS RELATED TO DEPRESSION

Compared to prevalence studies, few studies have evaluated the factors associated with the development of depression in children and adolescents. Most of the studies which have reported factors associated

**Table 2: Point prevalence of depression in children and adolescent in school-based studies**

Author	Study design	Study site	Sample size	Age range of participant in years	Sampling technique	Instrument used	Point prevalence
Mishra and Sharma <sup>[17]</sup>	Cross-sectional	Delhi	1097 girls	12-18	School random selected	Youth self-report Self-designed questionnaire	Anxious/ depressed: 10.3%
Nair <i>et al.</i> <sup>[18]</sup>	Cross-sectional	Thiruvananthapuram	1014	13-19	School-going and school dropouts	BDI (cut-off $\geq 17$ )	School dropout: 31% School-going: 16.1% College-going: 10%
Bansal <i>et al.</i> <sup>[19]</sup>	Cross-sectional	Pune	125	9 <sup>th</sup> std		GHQ12, BDI (cut-off $\geq 12$ )	18.4%
Mohanraj and Subbaiah <sup>[20]</sup>	Cross-sectional	Chennai	964	10 <sup>th</sup> , 11 <sup>th</sup> , 12 <sup>th</sup> classes	Two-stage random	BDI (cut-off: $\geq 10$ )	60.8%
Verma <i>et al.</i> <sup>[21]</sup>	Cross-sectional	Raipur	321	12 <sup>th</sup>	Students from five schools were included. Two of the schools were affiliated to CBSE, two others to the Chhattisgarh board, and one school to the ICSE. It was used as a proxy of SES.	CES-D (cut-off: $\geq 15$ )	59.9%
Chauhan <i>et al.</i> <sup>[22]</sup>	Cross-sectional	Noida	800	16-18	Systematic random sampling	PHQ-9 (cut-off: $\geq 5$ )	38%
Kaur <i>et al.</i> <sup>[23]</sup>	Cross-sectional	Amritsar	200	18-24	Random	PHQ-9 (cut-off not mentioned)	16.5%
Sharma <sup>[24]</sup>	Cross-sectional	Chandigarh	300	11 <sup>th</sup> standard	Stratified random	BDI-II (cut-off not mentioned)	55%
Patil <sup>[25]</sup>	Cross-sectional	Mangalore	500	Adolescent students, 1 <sup>st</sup> and 2 <sup>nd</sup> -year polytechnic college student	Systematic random sampling	BDI-I (cut-off not mentioned)	68%
Jayanthi and Thirunavukarasu <sup>[26]</sup>	Cross-sectional	Thiruvallur	2432	9 <sup>th</sup> -12 <sup>th</sup> grade (14-17)	Multistage	Screened using MINI-KID depression module followed by assessment by a psychiatrist then, BDI applied to grade the severity (cut-off not mentioned)	25%
Malik <i>et al.</i> <sup>[27]</sup>	cross-sectional	Urban Rohtak	374	13-17	All the students of class 9 <sup>th</sup> and 10 <sup>th</sup> who were present on the day of the visit included	BDI (cut-off $\geq 21$ )	52.9%
Beniwal <i>et al.</i> <sup>[28]</sup>	Cross-sectional	Bikaner	1200	6-12	Multistage	CES-DS (cut-off $\geq 15$ ) DSM IV-TR criteria	Screen positive: 121 (10.08%) Confirmed: 28 (2.33%)
Rama <i>et al.</i> <sup>[29]</sup>	Cross-sectional	Urban Bhopal	136	9 <sup>th</sup> and 10 <sup>th</sup>	Random	BDI (cut-off $\geq 11$ ) and some self-generated questionnaire	71.3%
Balgir <i>et al.</i> <sup>[30]</sup>	Cross-sectional study	Patiala	912	11-16	Stratified cluster sampling	SDQ followed by ICD-10 for those with SDQ+	SDQ: 40.2% Urban: 4.5% Rural: 3.8%
Jha <i>et al.</i> <sup>[31]</sup>	Cross sectional	Urban Bihar	1485	14-18		BDI-II (cut-off $\geq 14$ )	49.2%

*Contd...*

**Table 2: Contd...**

Author	Study design	Study site	Sample size	Age range of participant in years	Sampling technique	Instrument used	Point prevalence
Sandal <i>et al.</i> <sup>[32]</sup>	Cross-sectional	Chandigarh	470	9 <sup>th</sup> -12 <sup>th</sup>	Systematic random	DAS scale (cut-off not mentioned)	Depression: 65.53% Anxiety: 80.85% Stress: 47.02%
Satyanarayana <i>et al.</i> <sup>[33]</sup>	Cross-sectional	Tribal, rural, and urban areas of Mysuru	Tribal: 186 Rural: 200 Urban: 194	14-16	Schools were selected, and sampling was done according to probability proportionate to the size	MINI-KID	3.1% overall Urban: 4.1% Rural: 3.5% Tribal: 1.6%
Singh <i>et al.</i> <sup>[34]</sup>	Cross-sectional	Chandigarh		13-18	Multistage sampling technique	PHQ-9 (cut-off $\geq 5$ ) for depression and associated factors by a pretested semi-structured interview schedule	40%
Basker <i>et al.</i> <sup>[35]</sup>	Cross-sectional	Vellore	178	>13	Consecutive adolescents	BDI (cut-off score of $\geq 5$ for screening and $\geq 22$ for diagnostic utility ICD-10 criteria)	ICD-10 criteria 6.1%
Russell <i>et al.</i> <sup>[36]</sup>	Cross-sectional	Vellore	181	>13	Consecutive adolescents	BDI, CDRS-R, ICD-10 criteria	ICD-10 criteria: 6.07%
Shukla <i>et al.</i> , 2017 <sup>[37]</sup>	Cross-sectional	Barabanki, Uttar Pradesh	336	10-19	Multistage sampling technique	KADS (cut-off not mentioned)	18.7%

ICD—International Classification of Diseases; DSM—Diagnostic and Statistical Manual of Mental Disorders; CDI—Children's Depression Inventory; BDI—Beck's Depression Inventory; GHQ12—General Health Questionnaire-12; CES-D—Centre for Epidemiological Studies - Depression; MINI-KID—Mini International Neuropsychiatric Interview for children and adolescent; SDQ—Strength and Difficulties Questionnaire; DAS—Depression Anxiety and Stress; PHQ-9—Patient Health Questionnaire-9; CDRS-R—Children's Depression Rating Scale-Revised; KADS—Kutcher Adolescent Depression Scale

with depression have been clinic-based<sup>[10,59,60]</sup> or school-based<sup>[19,21,22,28,29,31,34,61]</sup> and have evaluated life events, demographic factors, or clinical factors associated with the development of depression. These factors can be categorized as those related to studies or education, relationship issues in the familial context, familial issues, economic difficulties, and other factors [Table 4]. A study which evaluated the factors associated with the development of depression in the descriptive analysis and then confirmed the same using binary logistic regression analysis identified being in class tenth and lack of self-satisfaction with academics as the most important predictors of depression in children and adolescents.<sup>[34]</sup>

### Symptom profile of depression

Only a handful of studies have reported the symptom profile of depression in children and adolescents.<sup>[10,20,31,59,60]</sup> Most of the data are from retrospective, clinic-based studies<sup>[10,59,60]</sup> [Table 5]. As is evident from Table 5, it is difficult to compare the symptom profile, as the profile reported in the literature is not specific to any particular scale. The commonly reported symptoms have varied from study to study. Only one study had

reported the symptom profile of depression in children and adolescents using the BDI.<sup>[20]</sup> As is evident from Table 3, the commonly reported symptoms include depressed mood, diminished interest in play activities, concentration difficulties, behavior problems in the form of anger and aggression, pessimism, decreased appetite, decreased sleep, anhedonia, and somatic symptoms. Only one study, from Rohtak, compared the symptom profile of depression in childhood and adulthood. This study included 32 children and 20 adults diagnosed with major depressive disorder as per DSM-IV criteria.<sup>[62]</sup> Compared with the adults, more children presented with the somatic symptoms, and the predominant mood symptom in the children was irritability, in contrast to sadness in the adults. In children, dysfunction was noted exclusively in the form of poor scholastic performance and reduced play activity; whereas among the adults, dysfunction manifested in the form of poor work performance. The groups did not differ in terms of family history of affective disorders, type of onset, or presence of precipitating factors.<sup>[62]</sup> A study from National Institute of Mental Health and Neurosciences, Bengaluru, reported that children and adolescents with BPAD-II are often diagnosed

**Table 3: Point prevalence of depression in children and adolescent in community-based studies**

Author	Study design	Study site	Sample size	Age range of participant in years	Sampling technique	Instrument used	Point prevalence
Nandi <i>et al.</i> <sup>[38]</sup>	Cross-sectional	Rural West Bengal	1060 persons	All age (all members of the family)	Field survey, door-to-door enquiry of each family as a unit and of each member of the family separately	Self-designed schedules	0 (in 0-23 years)
Nandi <i>et al.</i> <sup>[39]</sup>	Follow-up of 1972 study	Rural West Bengal	1539 persons	All age (all members of the family)	Field survey, door-to-door enquiry of each family as a unit and of each member of the family separately	Self-designed schedules	0 (in 0-23 years) between 1972 and 1982
Nandi <i>et al.</i> <sup>[40]</sup>	Follow-up of 1972 study	Rural West Bengal	1539 persons	All age (all members of the family)	Field survey, door-to-door enquiry of each family as a unit and of each member of the family separately	Self-designed schedules	No data
Anita <i>et al.</i> <sup>[41]</sup>	Cross-sectional	Rural and urban area Rohtak	400 children each from urban and rural	6-14	Data not available	Data not available	Psychiatric disorders: 16.5% Depression: 0.37%
Srinath <i>et al.</i> <sup>[42]</sup>	Cross-sectional	Urban and rural areas of Bengaluru	2064	0-16	Stratified random sampling	ICD-10 DCR	Psychiatric disorders: 12.5% Depression: 0.5% (2 cases of 1578 cases between 4 and 16 years)
Patil <i>et al.</i> <sup>[43]</sup>	Cross-sectional	Urban slums Mumbai	257 children urban slum	5-14	The household was used as a sampling unit and a systematic random sampling method used for selecting household	Semi-structured diagnostic interview schedule-based on DSM-IV	Psychiatric morbidity: 14.8% Depression: 0.4%
National Health Mission, Himachal Pradesh survey 2014-15 <sup>[44]</sup>	Cross-sectional	Whole of HP	2895	10-24	Stratified multistage clustered survey covering the whole state	Self-designed questionnaire	6.94%
Mishra <i>et al.</i> <sup>[45]</sup>	Cross-sectional	Rural and suburban areas of eastern Uttar Pradesh	200	11-18	Systemic random sampling	CDI (cut-off: ≥19)	14.5%

ICD–International Classification of Diseases; DCR–Diagnostic Criteria for Research; DSM–Diagnostic and Statistical Manual of Mental Disorders

and categorized as major depression as a past history of hypomania is missed. In this study of 61 subjects diagnosed as having major depression, 20% of subjects had a diagnosis of hypomania in the past.<sup>[63]</sup>

Although community-based studies have not reported symptom profile, many of these studies have reported the severity of depression based on the various cut-offs given for a particular scale [Table 6]. In general, most of these studies suggest that depression in children and adolescents is of mild severity, and only a small proportion of them have severe depression. In clinic-based studies, as is understandable, the depression seen is more severe, where moderate depression was reported in more than half (56%) of the participants and severe depression in one-fourth (26%).<sup>[59]</sup>

### COMORBIDITY IN CHILDREN AND ADOLESCENTS WITH DEPRESSION

Few clinic-based studies have reported on comorbid psychiatric disorders in children and adolescents

presenting with depression.<sup>[10,59,62]</sup> Among the various psychiatric disorders, the commonly reported comorbidities include anxiety/anxiety disorders (10.36%–57.65%),<sup>[10,32,59,62]</sup> dysthymia (20%),<sup>[59]</sup> attention deficit hyperactivity disorder (7.77%–20),<sup>[10,62]</sup> conduct disorder (5.18%–9%),<sup>[10,59]</sup> dissociative disorder/conversion disorder (5.18%–9%),<sup>[10,59,62]</sup> and obsessive compulsive disorder (7%).<sup>[59]</sup>

### INTERVENTION STUDIES

Although antidepressants are used in the management of depression in children and adolescents, no studies from India have evaluated the efficacy/effectiveness of antidepressants in children and adolescents with depression. However, a few studies have reported the use of electroconvulsive therapy (ECT) for depression in children and adolescents.<sup>[64,65]</sup> These studies suggest that 12%–13% of children and adolescents receiving ECT are diagnosed with depressive disorders and that ECT is effective in most of these patients.<sup>[64,65]</sup>

**Table 4: Factors associated with depression in children and adolescents**

Education related
Academic satisfaction of parent <sup>[29]#</sup>
Not performing well <sup>[29]#</sup>
Physical punishment at school <sup>[19]#</sup>
Self or parental dissatisfaction with academic achievement <sup>[21]#</sup>
Stress at school <sup>[59]@</sup>
Students staying away from home <sup>[21]#</sup>
Teasing at school <sup>[19]#</sup>
Academic stressors <sup>[10]@</sup>
Change of schooling <sup>[10]@</sup>
Inability to cope with academics <sup>[31]#</sup>
Government school <sup>[34]#</sup>
Studying in class X <sup>th</sup> and XII <sup>th</sup> <sup>[34]#</sup>
Spending less time in studies <sup>[34]#</sup>
Lack of supportive environment in school <sup>[34]#</sup>
Lower level of participation in cultural activities <sup>[34]#</sup>
Lower academic performance <sup>[61]#</sup>
Failure in examination <sup>[61]#</sup>
Relationship issues with parents or at home
Argument with our parents <sup>[29]#</sup>
Familial discord <sup>[31]#</sup>
Poor relationship with family <sup>[21]#</sup>
Relationship difficulties <sup>[31]#</sup>
Parental fights <sup>[19]#</sup>
Stress in the family <sup>[59]@</sup>
Interpersonal conflicts or scoldings <sup>[10]@</sup>
Physical abuse by family members <sup>[10]#</sup>
Family-related issues
Birth of a sibling <sup>[10]@</sup>
Family history of psychiatric illness <sup>[10]@</sup>
Change of house/residence <sup>[10,61]@,#</sup>
Rejection <sup>[28]#</sup>
Punishments <sup>[28]#</sup>
Deprivation of privileges <sup>[28]#</sup>
Working mothers <sup>[21]#</sup>
Death of a family member <sup>[61]#</sup>
Alcohol use and smoking by father <sup>[34]#</sup>
Prolonged absence or death of a parent <sup>[60]@</sup>
Economic difficulties
Economic difficulties <sup>[19,31]#</sup>
Others
Extracurricular activities and type of activities <sup>[22]#</sup>
Extracurricular activity <sup>[29]#</sup>
Going out for outing <sup>[22]#</sup>
Not having a hobby <sup>[21]#</sup>
Peer pressure <sup>[21,29]#</sup>
Social isolation <sup>[28]#</sup>
Illness, injury/death <sup>[10]@</sup>
Serious illness <sup>[61]#</sup>
Rural locality <sup>[34]#</sup>
Having a boy/girlfriend <sup>[34]#</sup>
End of a relationship <sup>[61]#</sup>

@Data from clinic-based studies; #School-based studies

## DISCUSSION

This review of the literature on depression in children and adolescents suggests that depression does occur in children and adolescents in the Indian context. When the findings of the community-based studies, especially the NMHS, are considered, the data from India are comparable to the data from other parts of the world.<sup>[66]</sup> When the findings about the school-going adolescents are compared with the data from other countries,

**Table 5: Symptom profile of depression in children and adolescents**

Depressed/low mood/sadness <sup>[10,20,31,60]</sup> (51.9%-86%)
Crying spells <sup>[20]</sup> (36%-54%)
Diminished interest in play and activities <sup>[31,59]</sup> (46.3%-87%)
Problems with concentration <sup>[10,31,59]</sup> (40.7%-82%)
Excessive tiredness/fatigue/weakness <sup>[10,31,59]</sup> (32%-67%)
Behavior symptoms such as anger and aggression/agitation <sup>[31,59]</sup> (47%-64%)
Self-accusation/self-criticism <sup>[10,20,31]</sup> (7.4%-62%)
Work difficulty <sup>[20]</sup> (59%)
Expectation of punishment <sup>[20,31]</sup> (43%-58%)
Pessimism <sup>[20,31]</sup> (37%-58.14%)
Decreased appetite <sup>[10,31,59]</sup> (48.1%-56%)
Anorexia <sup>[20]</sup> (37%)
Decreased sleep/change in sleeping pattern <sup>[10,20,31,59]</sup> (37%-48.1%)
Increased appetite, weight gain, and excessive sleep <sup>[59]</sup> (2.23%)
Past failure/sense of failure <sup>[20,31]</sup> (47%-55.81%)
Anhedonia <sup>[10]</sup> (51.9%)
Anxiety symptoms <sup>[10]</sup> (37%)
Irritability <sup>[10,20,31,59]</sup> (14%-66%)
Hopelessness <sup>[10]</sup> (18.5%)
Somatic symptoms/multiple somatic complaints such as head ache, abdominal pain, and chest pain <sup>[10,20,31,59,60]</sup> (18.5%-53%)
Suicidal ideations/thoughts <sup>[10,20,31,59]</sup> (11.1%-27%)
Psychotic features <sup>[10,31]</sup> (7%-11%), in the form of persecutory delusions <sup>[10]</sup>
Catatonia <sup>[10]</sup> (3.7%)
Depersonalization <sup>[10]</sup> (3.7%)
Obsessive compulsive symptoms <sup>[10]</sup> (3.7%)
Guilt <sup>[10,20,31,59]</sup> (7.4%-69.48%)
Attempted suicide <sup>[31,59]</sup> (4%-16%)
Recent deterioration in school performance <sup>[59]</sup> (36%)
Dissatisfaction <sup>[20]</sup> (49%)
Self-dislike <sup>[20,31]</sup> (42%-47%)
Indecisiveness <sup>[20,31]</sup> (49%)
Social withdrawal <sup>[20]</sup> (48%)
Loss of libido <sup>[20,31]</sup> (14%-32%)
Body image changes <sup>[20]</sup> (29%)
Poor interaction <sup>[10]</sup> (33.3%)
Decreased interest in school <sup>[60]</sup> (32.3%)
Low self-esteem <sup>[31]</sup> (27%)
Death wishes <sup>[60]</sup> (17.6%)
Worthlessness <sup>[31]</sup> (29%)
Loss of energy <sup>[31]</sup> (39%)

the point prevalence range in studies from India is wider and more heterogeneous.<sup>[67]</sup> Taken together, these findings suggest that there is a need to focus on depression in children and adolescents.

However, it is important to note that although many studies have evaluated the prevalence of depression in clinic-based samples, community samples, and school-based participants, these studies have a lot of limitations. Most of the school-based studies relied on a screening questionnaire to quantify depression.<sup>[17-25,27,29,31,32,34,37]</sup> It is well-known that screening instruments often lead to overestimation of the point prevalence of a disorder when the same is compared with an evaluation using a structured diagnostic interview.<sup>[26,28,30,33,35,36]</sup> This is also reflected by a study that used a two-stage method to quantify depression. When the study sample was screened using CED-D scale, the point prevalence of depression was found to be 10.08%, which reduced to 2.33% when evaluated on

**Table 6: Severity grades for depression in children and adolescents**

	Point prevalence	Severity grade
Patil <i>et al.</i> <sup>[25]</sup>	68% (BDI cut-off not mentioned)	Mild mood disturbance: 30% Borderline clinical depression: 12% Moderate: 18% Severe: 6% Extreme: 2%
Sharma <sup>[24]</sup>	55% (BDI-II cut-off not mentioned)	Mild: 19.3% Moderate: 21% Severe: 14.7%
Sandal <i>et al.</i> <sup>[32]</sup>	65.53% (DAS cut-off not mentioned)	9 <sup>th</sup> std: mild: 15.56%, moderate: 29.63%, severe: 10.37%, extreme: 3.7% 10 <sup>th</sup> std: mild: 25.47%, moderate: 30.19%, severe: 13.21, extreme: 4.72% 11 <sup>th</sup> std: mild: 16.39%, moderate: 27.87%, severe: 9.84%, extreme: 0.82% 12 <sup>th</sup> std: mild: 21.36%, moderate: 40.78%, severe: 11.65%, extreme: 2.91%
Jha <i>et al.</i> <sup>[31]</sup>	49.2% (BDI-II)	Mild: 23.4% (14-19) Moderate: 18.1% (20-28) Severe: 7.7% (29-63)
Krishnakumar and Geeta <sup>[59]</sup>	Clinic-based retrospective data	Mild: 18% Moderate: 56% Severe: 26%
Rama <i>et al.</i> <sup>[29]</sup>	71.3 (BDI)	Mild: 44.1% (11-20) Moderate: 24.3% (21-30) Severe: 3% ( $\geq 30$ )
Malik <i>et al.</i> <sup>[27]</sup>	52.9% (BDI)	Mild: 39.8% (11-20) Moderate: 11.3% (21-30) Severe: 1.8% ( $\geq 30$ )
Nair <i>et al.</i> <sup>[18]</sup>	School dropout: 31% School-going: 16.1% College-going: 10% (BDI)	Severe (31-40) and extreme ( $\geq 41$ ) School dropout girls: 9.5% and 1.7% School-going girls: 2.6% and 0.2% School-going boys: 1.4% and 0.2%
Mohanraj and Subbaiah <sup>[20]</sup>	60.8% (BDI)	Mild: 37.1% (10-19) Moderate: 19.4% (20-29) Severe: 4.3% ( $\geq 30$ )
Chauhan <i>et al.</i> <sup>[22]</sup>	38% (PHQ-9)	Mild: 75.73 (5-9) Moderate: 23.52 (10-14) Moderately severe: 0.01 (15-19)
Verma <i>et al.</i> <sup>[21]</sup>	59.9% (CES-D)	Mild: 40.49% (15-21) Major: 19% ( $\geq 21$ )
Jayanthi and Thirunavukarasu <sup>[26]</sup>	25% (BDI cut-off not mentioned)	Minimal: 9.3% Mild: 25.4% Moderate: 45.7% Severe: 19.6%
Singh <i>et al.</i> <sup>[34]</sup>	40% (PHQ)	Mild: 29.7% (PHQ 5-9) Moderate: 15.5% (PHQ 10-14) Moderately severe: 3.7% (PHQ 15-19) Severe: 1.1% (PHQ 20-27)

BDI–Beck Depression Inventory; DAS–Depression Anxiety and Stress; PHQ-9–Patient Health Questionnaire-9; CES-D–Centre for Epidemiological Studies - Depression

DSM-IV TR criteria, suggesting that two-stage methods can actually lead to a reduction in point prevalence rate by about 80%.<sup>[28]</sup> One school-based study evaluated depression using MINI-KID depression screening module and claimed that participants found to have depression were further evaluated by the psychiatrist to confirm the diagnosis of depression. However, this study failed to give separate point prevalence rates of depression for both the evaluations.<sup>[26]</sup> Hence, it is not clear from the article whether the 25% point prevalence is for the first phase of evaluation or the second stage.

A good aspect of most of these studies is that these have used BDI to screen depression. A study from

Vellore compared BDI and Children's Depression Rating Scale-Revised (CDRS-R) against the diagnosis made by the psychiatrist using ICD-10 criteria.<sup>[36]</sup> This study showed that compared with CDRS-R, BDI was a better screening instrument for depression in children and adolescents.<sup>[36]</sup> In another study, the same group of authors evaluated the diagnostic accuracy of use of BDI and CDRS-R by one pediatrician against the diagnosis by psychiatrist in a primary care setting. The authors reported that a score of  $\geq 22$  for BDI and  $\geq 30$  on CDRS-R has diagnostic utility.<sup>[35,68]</sup> If one looks at the cut-offs used in the various studies which used BDI, it is apparent that most of these studies adopted a cut-off of 14–15, which possibly can explain



the high point prevalence of depression reported in school-based studies.

Another limitation of school-based studies in the Indian context includes lack of representativeness of the study sample, considering that a significant proportion of children and adolescent dropout of the school by the middle or high school.

The community-based studies which have used two-stage method to evaluate depression, that is, initial screening followed by confirmation by use of diagnostic interviews, have reported much lower rates of depression.<sup>[42-44]</sup> However, a limitation of these studies is that these did not include any screen-negative population in the second-stage evaluation, and this could have led to the reporting of a lower point prevalence of depression.

Ideally, community- and school-based studies should preferably evaluate all the eligible children and adolescents on a structured diagnostic interview which is administered by a mental health professional or trained personnel to quantify the point prevalence of depression; however, this is often not feasible. To overcome this, it is suggested that initially the participants should be screened using a standard questionnaire, which can be administered by a minimally trained person or a layperson, and those found to have depression should be evaluated on a structured interview. However, it is important to remember that to get an appropriate estimation of the point prevalence of depression, a small proportion of the screen-negative participants too should receive an evaluation on the structured interview schedule point prevalence. Accordingly, it is suggested that future studies must follow this methodology to estimate the point prevalence of depression in children and adolescents. Also, there is a need to develop standardized universal screening and structured assessment methods for various levels of epidemiological investigations, and there is a need to use these uniformly for better comparison and information. It is reflected in results of NMHS, which yields rates of depression in adolescents comparable to global trends.

When one attempts to look at the available point prevalence data, the important fact which emerges is that except for clinic-based studies, most of the school- and community-based studies have mainly focused on adolescents rather than children (i.e., those age < 12 years).

Data on factors related to depression are limited to a handful of studies and are not sufficient for generalizations. Most of the data are from clinic-based retrospective studies,<sup>[10,59,60]</sup> and these have reported certain life events to be associated with the development

of depression. However, it is important to remember that the studies did not use a structured instrument to assess the life events associated with the development of depression. Retrospective studies are often limited to the documented information, and the quality of information is often guided by the motivation of the persons maintaining the records. Furthermore, regarding case-notes-based retrospective studies, the information may not have been recorded in the case notes in systematic ways. Hence, there is a need to carry out future research in this area using standardized instruments. The association of the stability of the presence of the causal factor with continuity of depression at an individual level should be studied as the children and adolescents age. Similarly, the stability of effects of a causal factor with continuity of the form of depression at an individual level too should be studied as the children and adolescents age. All this will require a prospective design to yield a better understanding of the relationship with risk factors. A high-risk population of siblings/offspring of persons with depression or other major mental disorders too can be studied for this purpose.

It is often argued that the symptom profile of depression in children and adolescents differs from that of adults, and it is not proper to use the same diagnostic criteria for children and adolescents, as used for adults.<sup>[69-71]</sup> It is surprising that only a handful of studies have evaluated the symptom profile of depression in children and adolescents.<sup>[10,20,31,59,60]</sup> The symptom profile reported in most of these studies is again based on case notes, except for one study which reported symptoms as per the BDI.<sup>[20]</sup> These studies have come up with varying point prevalence of different symptoms of depression, and accordingly, it is difficult to comment on the common symptoms of depression seen in children and adolescents in the Indian context.

Similarly, data are also limited with respect to comorbidity. Although, in recent times, there have been multicentric studies from India which evaluated the symptom profile of depression in adult<sup>[72]</sup> and elderly patients,<sup>[73]</sup> no multicentric study from India has evaluated the symptom profile of depression in children and adolescents in the Indian context. Accordingly, there is an urgent need to carry out a multicentric study to evaluate various aspects of depression in children and adolescents.

Studies from the developed countries suggest that there is a developmental perspective to the symptom profile of depression in children and adolescents. Children and adolescent group, as such, is not a homogeneous group.<sup>[74]</sup> However, none of the studies from India has looked into this aspect. Understanding this can actually help in recognizing the age-appropriate symptoms of

depression. Only one small size, clinic-based study had compared the symptom profile of depression in children and adolescents with that of adults.<sup>[62]</sup> This issue is of much importance, as in a country like India most of the psychiatrists are mainly trained in adult psychiatry and hence may not be able to pick up age-appropriate symptoms of depression. Studying these similarities and differences can provide valuable knowledge which can be useful in detecting depression in day-to-day clinical practice.

Along with cross-sectional studies, longitudinal designs are also needed to understand the continuity of symptoms. These should be seen at symptom level, to differentiate them from normal development (with the inclusion of normal and/or at risk population); syndrome level, to differentiate the total picture across the developmental level; and disorder level, to see the characteristic dysfunction and pattern of evolution.

Surprisingly, there is a lack of research in the area of biological and psychological correlates of depression in children and adolescents in India. Also, there are no data on the course and outcome of depression in children and adolescents in India.

To conclude, this review suggests that there is a wide variation in the point prevalence of depression reported in studies from India. There is a wide gap in understanding the risk factors and symptom profile of depression in children and adolescents. There is a lack of studies which evaluated the efficacy/effectiveness of depression in children and adolescents. Similarly, little is known about various correlates of depression. Accordingly, it can be said that the research on depression in children and adolescents in the Indian context lags behind that being done on adults.

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