

## Original Research Article

# Prevalence of depression and its associated risk factors among children and adolescent screened at a tertiary care hospital

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**Received:** 21 October 2024

**Revised:** 09 December 2024

**Accepted:** 11 December 2024

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## ABSTRACT

**Background:** Depression in children and adolescents has been increasing worldwide especially in the adolescence. Despite its high prevalence and its substantial impact, the detection and its treatment in primary care setting have been suboptimal. To estimate the prevalence of depression among 8-17 years attending OPD at a tertiary care hospital and the risk factors associated with it.

**Methods:** A cross-sectional study done among 400 participants of 08 to 17 years of age presenting to Pediatric and Medicine Outpatient departments of a Tertiary Care Hospital at Puducherry. A three-step process on diagnosis was involved. Step 1 included screening for psychiatric morbidities using Tamil and English version of Strengths and Difficulties Standardized Questionnaire. Those scoring above 19 were subjected to a second screening test for depression using Centre for Epidemiological Studies Depression scale for Children. All these participants were referred for psychiatric assessment irrespective of their CES-DC score for diagnosis. The data was analysed by descriptive statistics.

**Results:** Among the study population, 49 (12.25%) participants had depression. Among the participants with 8 to 12 years of age, 10 (5%) participants had depression. Among the participants with aged 13 to 17 years, 39 (19.5%) participants had depression. The risk factors significantly associated with depression include age group, friends, sickness, constant fidgeting/squirming, temper tantrum, bullying, addiction in parents, parent education.

**Conclusion:** Owing to the prevalence of depression in our study especially in the late adolescent, the importance is to be given for early diagnosis and appropriate management.

**Keywords:** Depression, Adolescents, Prevalence, Preadolescent, Tertiary care, Hospital

## INTRODUCTION

Depression once considered an adult affliction, has increasingly become a pressing concern among children and adolescents worldwide. The World Health Organization (WHO) estimates that approximately 3.2%

in children worldwide suffer from depression and its life time prevalence ranges from 8-12%.<sup>1</sup> Despite its high prevalence and its substantial impact, the detection and its treatment in primary care setting have been suboptimal. It often goes unrecognized, misdiagnosed, or untreated, leaving vulnerable minds to navigate through the darkness alone.<sup>1</sup> The consequences of untreated

depression in children can be devastating, leading to poor academic performance, strained relationships, anxiety disorders, substance abuse, poor quality of life and increased risk of suicidal ideation. Depression in younger population during childhood and adolescent deserve special attention, considering the serious and lasting consequences of the disease. It is important and crucial for all mental health providers, educators and caregivers to acknowledge the gravity of the situation.

There are only few studies in India about the incidence of depression and other psychiatric illness in children and adolescent age group. Hence this study was done to know about its burden, risk factors, evaluate a screening tool for primary care physician and to create awareness about early recognition and intervention, provide, compassionate support, and evidence-based solution to ensure the well-being of our most vulnerable population.

### **Primary objective**

To estimate the prevalence of depression among 8-17 years' group of children and adolescent attending OPD at a tertiary care hospital.

### **Secondary objective**

To estimate prevalence of other psychiatric morbidities among 8-17 years of children attending OPD at a tertiary care hospital. To estimate the risk factors associated with depression among children and adolescent 8-17 years' age group attending OPD at a tertiary care hospital.

## **METHODS**

### **Study design**

This was a cross-sectional study.

### **Study place**

The study was conducted in the Pediatric and Medicine OPD of Rajiv Gandhi Government Women and Children Hospital (RGGWCH) and Indira Gandhi Government General Hospital & Post graduate Institute (IGGGH & PGI), Puducherry.

### **Study duration**

The period of study was over 1.5-year.

They were categorized as group 1 which included children of 8-12 years of age and Group 2 included adolescent of age 13-17 years respectively.

### **Inclusion criteria**

Prior informed consent and assent obtained from children, adolescent and the parent. Participants who

were willing to participate were only included in the study.

### **Exclusion criteria**

Children and Adolescents with known neurocognitive disorders, those who had taken the test before and Children and adolescents who were sick and required immediate medical intervention were excluded.

A three-step process on diagnosis was involved. Step 1 included screening for psychiatric and behavioral morbidities using the English and Tamil version of standardized strengths and difficulties questionnaire (SDQ). Questionnaire for age 8-10 years were filled by the parent preferably mother and for age 11-17 years by the participants.

Then it was evaluated and given scores. A study done by Singh et al, in Delhi concluded that the results of validation indicated that strengths and difficulties questionnaire was an acceptable questionnaire in India.<sup>2</sup>

For parent reports, the SDQ area under the curve (95 % confidence interval) was 0.87 (0.83-0.91).<sup>3</sup> The SDQ self-report Tamil version had been used for screening for mental health problems. For SDQ Tamil version, area under curve 0.87 (95%-CI=0.79-0.93), sensitivity of 69.4%, specificity of 92.2% & Cronbach's alpha values 0.67-0.78 2-4. Those scoring above 19 were subjected to step 2 and 3 (Figure 1).<sup>3</sup>

Step 2 included second screening test for depression using centre for epidemiological studies – standardized depression scale for children (CES-DC). A systematic review and meta-analysis done by Stockings et al found that CES-DC had 'good' internal reliability (pooled estimate: 0.89, 95% Confidence Interval (CI): 0.86-0.92), Sensitivity (0.80, 95% CI: 0.76-0.84) and specificity (0.78, 95% CI: 0.74-0.83).<sup>5</sup> Those who score above 15 indicates major depression (Figure 2).<sup>4</sup>

Step 3 included all these participants were referred to psychiatric assessment irrespective of the CES-DC score. Psychiatric assessment was done to confirm the diagnosis of depression and other psychiatric morbidities. For every participant, who were referred to psychiatrist, written feedback was taken with reference to diagnosis. Participants with borderline SDQ score were re-evaluated after 3 months and they were excluded. Participants were simultaneously counselled and intervention was done in cases where depression was diagnosed.

### **Sample size**

The sample size was 400 with 200 in each group of 8-12 years and 13-17 years. The sample size was estimated by the average study population between 8-17 years and with assumed prevalence of depression of 50% and with precision of 5% with 95% confidence interval.

### Statistical analysis

SDQ score, CES-DC score was considered as primary outcome variables. psychiatrist opinion considered as primary explanatory variable. Age, gender was considered as secondary explanatory variables. Descriptive analysis was carried out by mean and standard deviation for quantitative variables, frequency and proportion for categorical variables.

Categorical outcomes were compared between study groups using Chi square test /Fisher's Exact test (If the overall sample size was <20 or if the expected number in any one of the cells is <5, Fisher's exact test was used). IBM SPSS version 22 had been used for statistical analysis. (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.)

### RESULTS

The study was conducted among 400 children attending OPD at a tertiary care hospital. Among them 200 (50%) were children 8-12 years of age and 200 (50%) were adolescent in the age group (13-17 years). The male to female ratio was 1.3:1.

**Table 1: Profile of psychiatric morbidity pattern in children and adolescent.**

| Psychiatric morbidity                | 8-12 years (n=200) | 13-17 years (n=200) |
|--------------------------------------|--------------------|---------------------|
| <b>Total psychiatric morbidities</b> | 30 (15%)           | 51(25.5%)           |
| <b>Normal</b>                        | 170 (85%)          | 149 (74.5%)         |
| <b>Depression</b>                    | 10 (5%)            | 39 (19.5%)          |
| <b>Anxiety</b>                       | 10 (5%)            | 7 (3.5%)            |
| <b>Phobia</b>                        | 7 (3.5%)           | 3 (1.5%)            |
| <b>ADHD</b>                          | 1 (0.5%)           | 0 (0%)              |
| <b>oppositional defiant disorder</b> | 2 (1%)             | 2 (1%)              |

Frequency expressed in number (%)

**Table 2: Risk factors associated with depression.**

| Risk factors                         | Number (%)  | P value |
|--------------------------------------|-------------|---------|
| <b>Bullying</b>                      | 18 (36.73%) | <0.001  |
| <b>Sickness</b>                      | 24 (49.0%)  | <0.001  |
| <b>Friends</b>                       | 28 (57.14%) | <0.001  |
| <b>Constant fidgeting/ squirming</b> | 24 (48.97%) | <0.001  |
| <b>Temper tantrum</b>                | 3 (6.122%)  | 0.044   |
| <b>Addiction in parents</b>          | 30 (61.22%) | <0.001  |
| <b>Parent education</b>              | 48 (97.9%)  | <0.001  |
| <b>Age group 8-12 years</b>          | 10 (20.4%)  | <0.001  |
| <b>Age group 13-17 years</b>         | 39 (79.6%)  | <0.001  |

Frequency expressed in number (%) and p value<0.05 as significant.

The mean age of presentation was 12.49±2.9 (95% CI 12.21-12.78). The total Psychiatric morbidities were seen in 81 cases (20.2%) and among them 30 (15%) were in the age group of 8-12 years and 51(25.5%) were among the adolescent aged 13 to 17 years.

Among the participants with 8 to 12 years of age, 10 (5%) participants had depression and anxiety for each, 7 (3.50%) participants had phobia, 2 (1%) participants had oppositional defiant disorder and only 1 (0.50%) participant had ADHD. Among the participants with aged 13 to 17 years, 39 (19.5%) participants had depression, 7 (3.50%) participants had anxiety, 3 (1.50%) participants had phobia and 2(1%) participants had oppositional defiant disorder and only 1 (0.50%) participant had ADHD (Table 1).

Among the study population 49 (12.25%) participants had depression and among them 10 (20.4%) and 39 (79.6%) were in the age group of 8-12 years and 13-17 years respectively. Among the study population, addiction among parents for alcohol was 96(24%), smoking 17 (4.25%) and to both in 71 (17.75%). Among them SD score >19 was found in alcoholism in 19 (19.79%), smoking 13 (76.47%) and both 18 (25.3%) and was found to be statistically significant (p<0.05). In parental education 378 (94.5%) were literate and 22 (5.5%) were illiterate. Among the illiterate 13 (59.09%) had SD score >19 and 4 (18.18%) had CES-DC score >15 (p<0.05).

Among the study population, 125 (31.25%) had SDQ>19 and among them 8-12 years and 13-17 years were 64 (32%) and 61 (30.5%) and was not statistically significant. The CES-DC score <15 and >15 was found in 76 (19%) and 49 (12.25%) respectively. Among the study population with bullying was seen in 57 (14.25%) children, lack of friends in 33 (8.25%) cases, constant fidgeting and squirming in 38 (9.5%), temper tantrums (13, 3.25%).

Among them SD>19 was seen in bullying 36 (63.15%) and temper tantrums 10 (76.92%) and were statistically significant. The CES-DC score >15 in children 8-12 years and 13-17 years were 17 (8.5%) and 32 (16%) respectively (p<0.012). The CES-DC score >15 was associated with parental alcohol addiction (9, 9.37%), smoking (5, 29.41%), or both (6, 8.45%), lack of good friends (21, 63.6%), constant fidgeting/squirming (22, 57.89%), bullying (17, 29.82%), temper tantrums (5, 38.46%)

The risk factors that were statistically significant with depression based on Psychiatrist opinion, SDQ score and CES-DC score were bullying, sickness, friends, constant fidgeting/squirming, temper tantrums, addiction in parents, parent education. The risk factors were present in 10 cases (20.4%) in 8-12 years age group and 39 cases (79.6%) in 13-17 years age group (Table 2).

**Table 3: SDQ Questionnaire (A-false, B-somewhat true, C-certainly true.**

| Symptoms                                                         | A | B | C |
|------------------------------------------------------------------|---|---|---|
| Considerate of other people's feelings                           |   |   |   |
| Restless, overactive, can't stay still for long                  |   |   |   |
| Often complains of headaches, stomach-aches, or sickness         |   |   |   |
| Shares readily with other children (treats, toys, pencils, etc.) |   |   |   |
| Often has temper tantrums or hot tempers                         |   |   |   |
| Rather solitary, tends to play alone                             |   |   |   |
| Generally obedient, usually does what adults request             |   |   |   |
| Many worries, often seems worried                                |   |   |   |
| Helpful if someone is hurt, upset or feeling ill                 |   |   |   |
| Constantly fidgeting or squirming                                |   |   |   |
| Has at least one good friend                                     |   |   |   |
| Often fights with other children or bullies them                 |   |   |   |
| Often unhappy, down-hearted or tearful                           |   |   |   |
| Generally liked by other children                                |   |   |   |
| Concentration wanders                                            |   |   |   |
| Nervous or clingy in new situations, easily loses confidence     |   |   |   |
| Kind to younger children                                         |   |   |   |
| Often lies or cheats                                             |   |   |   |
| Picked on or bullied by other children                           |   |   |   |
| Often volunteers to help others                                  |   |   |   |
| Thinks things out before acting                                  |   |   |   |
| Steals from home, school or elsewhere                            |   |   |   |
| Gets on better with adults than with other children              |   |   |   |
| Many fears, easily scared                                        |   |   |   |
| Sees task through to the end, good attention span                |   |   |   |

**Table 4: CES-DC Questionnaire (1-not at all, 2-a little, 3-somewhat, 4-a lot).**

| During the past week                                                                      | 1 | 2 | 3 | 4 |
|-------------------------------------------------------------------------------------------|---|---|---|---|
| I was usually bothered by things that usually don't bother me                             |   |   |   |   |
| I didn't feel like eating, I wasn't very hungry                                           |   |   |   |   |
| I was not able to feel happy, even when my family or friends tried to help me feel better |   |   |   |   |
| I felt like I was just as good as other kids                                              |   |   |   |   |
| I felt like I couldn't pay attention to what I was doing                                  |   |   |   |   |
| I felt down and unhappy                                                                   |   |   |   |   |
| I felt like I was too tired to do things                                                  |   |   |   |   |
| I felt like something good was going to happen                                            |   |   |   |   |
| I felt like things I did before didn't work out right                                     |   |   |   |   |
| I felt scared                                                                             |   |   |   |   |
| I didn't sleep as well as I usually sleep                                                 |   |   |   |   |
| I was happy                                                                               |   |   |   |   |
| I was more quiet than usual                                                               |   |   |   |   |
| I felt lonely, like I didn't have any friends                                             |   |   |   |   |
| I felt like kids I know weren't friendly or that they didn't want to be with me           |   |   |   |   |
| I had a good time                                                                         |   |   |   |   |
| I felt like crying                                                                        |   |   |   |   |
| I felt sad                                                                                |   |   |   |   |
| I felt people didn't like me                                                              |   |   |   |   |
| It was hard to get started doing things                                                   |   |   |   |   |

## DISCUSSION

In the present study, 49 (12.25%) participants among 8-17 years of age had depression. This was almost in the similar range in studies by Stockings E and Avanci et al (10.3%).<sup>5,6</sup> This was in contrast to studies by Khairkar et al (3.73%).<sup>7</sup> 10 (5%) participants among 8-12 years of age had depression. This was almost in the similar range in studies by Costello et al (2.8%).<sup>8</sup> 39 (19.5%) participants among 13-17 years of age had depression. This was almost in the similar range in studies by Singhal et al (18%).<sup>9</sup> This was in contrast to studies by Jayashree et al (40.8%) and Mishra et al (14.5%), where the prevalence was very high and study by Costello et al (5.6%) showed lower prevalence in comparison to our study.<sup>8,10,11</sup> The prevalence of depression was 15.1% in Chennai study by Poongothai et al in general population. This was almost in a similar range as that in children and adolescents in our population.<sup>12</sup>

In the present study, 81 (20.25%) participants among 8-17 years of age had psychiatric morbidities. This was in the similar range to studies by Khairkar et al (20.8%) whereas in the studies conducted by Ahmadpanah et al it was 8.6%, in Costello Egger et al it was 12% and, in the study, conducted by Merikangas et al it was of higher prevalence of 25%.<sup>7,13-15</sup> The psychiatric morbidities of ADHD, phobia and oppositional defiant disorders were more commonly seen in younger children whereas as depression and anxiety was more commonly seen in adolescent age group and similar to the previous studies.<sup>14,15</sup> In the present study, depression was found to be most common psychiatric morbidity among psychiatric illness and was more common among 13-17 years of age (19.5%) than in 8-12 years of age (5%) and was found to be statistically significant. This was similar to result shown by Costello et al.<sup>14</sup> Where 2.8% of 8-12 years of age and 5.6% of 13-17 years of age were depressed. This was in contrast to result shown by Mathet et al, where 10% of 7-12 years and 5% of 13-17 years of age were depressed.<sup>16</sup>

In this study, the incidence of depression was higher among 13-17 years' age group adolescents than 8-12 years' age group preadolescents as adolescence is the transitional phase of growth and development between childhood and adulthood. The physical, sexual, cognitive, social, emotional changes happen during this phase which can bring anticipation and anxiety for both children and their families that leads to depression.

In the present study, gender difference was not statistically associated with depression. Though in most of the studies, females were found to have higher incidence of depression than males but in this study, higher incidence was seen in males than females probably because the number of males were higher. In the present study, parental addiction was seen in 61% of participating parents either to alcohol or smoking or both and was significantly associated with depression and was

statistically significant. This was similar to results shown by Singh et al.<sup>2</sup> In the present study, bullying was significantly associated with depression. Bullying causes mild to severe psychological, social and physical trauma which leads to depression if not intervened. This was similar to results shown by Kaur et al and Ramya et al.<sup>17,18</sup> In the present study, there was a strong association between constant fidgeting/squirming and depression among 8-17 years of age which had not been reported in the previous studies. Constant fidgeting/squirming are early features of anxiety, ADHD which can lead to depression.

In the present study, participants having friends were significantly associated with depression. This was similar to results shown by Kaur et al.<sup>17</sup> Despite having friends, there was a statistically significant association in depressed children and adolescents. Probably peer pressure, academic stress, bullying, increased usage of gadgets would have prevented them from spending quality time with their friends and leading to depression.

In the present study, there was a strong association between sickness and depression. This was similar to results shown by Ramya et al.<sup>18</sup> The existence of sickness/co-morbidities has strong bearing on psychosomatic manifestation of mental illness. In the present study, temper tantrum was significantly associated with depression in children which had not been reported in the previous studies. Temper tantrums might be due to inadequate parental supervision and thus children getting feeling of insecurity which might lead to emotional distress and if it prolonged lead to depression. In the present study, parent education was significantly associated with depression. In this study, 97.9% participant parents were literate, so that is why it was statistically significant. Hence, in this study, 49 (12.25%) participants among 8-17 years of age had depression. Risk factors significantly associated with depression include age group, parent education, parent addiction, bullying, friends, sickness, temper tantrums, constant fidgeting / squirming.

## Limitations

The study was single centre hospital-based study, not community based. Prevalence of psychiatric illness would be better illustrated with a community-based study with larger sample size.

## CONCLUSION

Depression is the most common psychiatric disorder in children and adolescent and is increasing worldwide. Early detection, identification of risk factors and intervention is the optimum requirement to decrease the burden of mental health issues in children and adolescents.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

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**Cite this article as:** Abimannan V, Pothapregada S, Varadhan BB, Abimannan SV, Amisha. Prevalence of depression and its associated risk factors among children and adolescent screened at a tertiary care hospital. *Int J Contemp Pediatr* 2025;12:41-6.