# Frequency and Types of Anxiety-Related Emotional Disorders in Secondary School Children in an Urban Population from India

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## Abstract

*Background: Anxiety disorders are very common in secondary school children with little epidemiological data from countries like India. The objective of this study was to determine the frequency and type of anxiety disorders in children of a secondary school (std. 5th to 10th) and determine the validity of self-reporting and parent's reporting of anxiety on Screen for Child Anxiety Related Emotional Disorders (SCARED) questionnaire by a clinical interview.*
*Methods: Parents and children (n = 450) were administered the SCARED questionnaire and findings were statistically analyzed.*
*Results: In our study population, 36.7% of the children studying in secondary school (std. 5th to 10th) had an anxiety disorder. The SCARED screening test reported by the child had a high sensitivity (82.35%) and low specificity (48.05%). On combining the SCARED screening test of the child and parent in series, the net sensitivity dropped to 39.29 % while the net specificity increased to 95.00%. Thus, when both the parent and the child SCARED score was $\geq$25, there was 84.6 % chance that the child will have an anxiety disorder detected on clinical interview.*
*Conclusions: Both parents and children were quite accurate in their perception regarding the presence of anxiety disorders (German J Psychiatry 2013; 16(3): 112-118).*

*Keywords: anxiety disorder, emotional disorder, children, screening, DSM IV, SCARED*

## Introduction

Anxiety is the subjective sensation that accompanies the body's response to real or perceived threat. There was a surge of extensive research into childhood anxiety in the 1990s. Anxiety disorders have implications on a child's school and home functioning with repercussions on the development (Rapee et al., 2009). A significant proportion of childhood anxiety disorders have a chronic course, and even last into adulthood (Breton et al., 1999; Costello et al., 2003). The screening tools for anxiety in children include: SCARED (Screen for Child Anxiety Related Emotional Disorders; Ford et al., 2003), MASC (Multidimensional Anxiety Scale for Children; Lewinsohn et al., 1993) and RCADS (Revised Child Anxiety and Depression Scale; Lewinsohn et al., 1997). Screening has not been supplemented with clinical assessment of the children in majority of the studies. There is a dearth of data in the field of childhood anxiety from an Indian perspective. Anxiety disorders are not uncommon in children and adolescents though less frequent than in adults.

Around 2.5% to 5% of children and adolescents meet criteria for anxiety disorder (Bernstein & Shaw, 1997; Keller et

**Table 1. Demographic profile of all the study participants (450 subjects)**

| Variable | | Frequency (%) |
|---|---|---|
| Age (years) | | 12.5 (SD 1.64); range 9–16 |
| Sex | Male | 235 (52.2 %) |
| | Female | 215 (47.8%) |
| Educational Class | 5th Std | 79 (17%) |
| | 6th Std | 80 (18%) |
| | 7th Std | 62 (14%) |
| | 8th Std | 75 (17%) |
| | 9th Std | 62 (14%) |
| | 10th Std | 90 (20%) |
| Family type | Nuclear | 408 (90.7%) |
| | Joint | 42 (9.3%) |
| Father's Education | < 10th | 14 (3.1%) |
| | > 10th | 436 (96.9%) |
| Mother's Education | < 10th | 74 (16.4%) |
| | > 10th | 376 (83.6%) |
| Number of siblings | ≤ 1 | 339 (75.3%) |
| | ≥ 2 | 111 (24.7%) |
| Employment status of parents | Only father employed | 346 (76.9%) |
| | Both parents employed | 104 (23.1%) |

Std – standard (equivalent of grade, i.e. 1st grade in India)
10th = 10th grade school

**Table 2. Grouping of the study participants based on SCARED scale scores reported by the parent and child**

| Group | Child SCARED reporting | Parent SCARED reporting |
|---|---|---|
| 1 | + | + |
| 2 | + | – |
| 3 | – | + |
| 4 | – | – |

al., 1992; Pine, 1994; Velosa & Riddle, 2000). More than 10% of children have impairing anxiety (Birmaher et al., 1997; Rapee et al., 2009; Roza et al., 2003). A review of existing epidemiological evidence shows that lifetime estimates of anxiety disorder in pediatric samples can range from approximately 14 or 15%to as high as 25% (Chorpita et al., 2000). The primary objective of the study was to determine the frequency, type and phenomenology of anxiety disorders in children of a secondary school (std. 5th to 10th). The secondary objective was to assess the validity of self-reporting and parent's reporting of anxiety on Screen for Child Anxiety Related Emotional Disorders (SCARED) questionnaire by a clinical interview.

# Materials and Methods

## Subjects

This study design was cross-sectional. The study sample consisted of 450 children receiving secondary and higher secondary education (Std. 5th to 10th) at a central government aided school in Mumbai. The mean age of the study participants was 12.5 years (standard deviation=1.64). Male (52.2%) and female (47.8%) sex distribution in the study sample was almost equal. Majority of the study participants belonged to nuclear family (90.7%). Over two thirds of study participant's parents had education above 10th standard. In just a little less than one third of the study participant's, both the parents were employed (23.1%) (Table 1).

## Assessment

The Screen for Child Anxiety Related Emotional Disorders (SCARED) scale was used for the assessment of anxiety in children. The SCARED scale is available in 2 forms; one to be answered by the parents and other by the child. The scale consists of 41 items rated on a 3 point scale. A total score of ≥ 25 indicates the presence of an Anxiety Disorder. Depending on the score of different items on the scale, specific anxiety disorders like Generalized Anxiety Disorder, Social Anxiety Disorder, Panic Disorder, Social Phobia and School Avoidance can be diagnosed. A specially designed case record form was used to collect demographic data like age, sex, education, family type, educational background and occupation of parents etc. The DSM-IV-TR criteria for anxiety disorders in children and adolescents were used as the gold standard to identify children with anxiety disorders by a clinical interview.

The study was approved by Institutional Ethics Committee. A written informed consent of participating students and their parents was taken. The children receiving secondary and higher secondary education (Std. 5th to 10th) at the school were enrolled and their demographic data was recorded in the case record form. All students, from std. 5th to 10th and their parents willing to participate in the study and who signed the informed consent form were included in the study. The SCARED scale to be answered by child and the SCARED scale to be answered by parent were used to assess for anxiety in participating children. Children were asked the fill the SCARED scale for children questionnaire in front of the psychiatrist who explained the questions not understood by the children. The children were given the SCARED scale (parent version) to be filled by their parents. A total score of ≥ 25 was used to indicate the presence of an Anxiety Disorder. Based on the SCARED scale scores, the participants of the study were divided into four groups as shown in Table 2.

A psychiatric clinical interview was conducted in 20% of children and their parents, selected randomly, from groups 1, 2 and 3 each (i.e. groups in which either the parent or child SCARED score reporting was ≥ 25). In group 4 (i.e. group in which both the parent and the child SCARED score reporting was ≤ 25), all the children and their parents were interviewed. The clinical interview used the DSM IV-TR criteria to diagnose anxiety disorders in children. The clinical interview was conducted by a trained and experienced psychiatrist. The frequency and type of anxiety disorder in the interviewed study sample (111) was tabulated. The sensitivity, specificity and predictive value of SCARED scale reported by the child and of SCARED scale reported by the parent

**Table 3. Number of study participants in the four groups based on SCARED scale scores reported by the parent and child**

| Group | Child SCARED reporting | Parent SCARED reporting | Number (Percentage) |
|---|---|---|---|
| 1 | + | + | 65 (15%) |
| 2 | + | – | 276 (61%) |
| 3 | – | + | 83 (18%) |
| 4 | – | – | 26 (6%) |
| Total | | | 450 (100 %) |

+, SCARED score $\geq$ 25
-, SCARED score $\leq$ 25

were calculated based on SCARED scale reporting and the clinical interview.

## Statistical Analysis

The net sensitivity, specificity and predictive value of combined parent and child SCARED screening test in series and parallel were calculated. The net predictive value of the combined parent and child SCARED screening test in series and parallel was used to determine the number of subjects in the entire sample (450 subjects) with positive SCARED screening who would actually have anxiety disorder. The association of demographic variables with anxiety was determined using chi square test.

## Results

Based on the SCARED scale scores reported by the parent and child the study participants were grouped into 4 groups. In 76 % (341) of cases, the child reported anxiety in SCARED screening, in 33% (148) of cases the parent reported anxiety in SCARED screening, in 15% (65) of cases both reported anxiety in SCARED screening and in 6% (26) of cases none of them reported anxiety in SCARED screening (Table 3). Twenty per cent of children (and their parents) in the study group 1, 2 and 3 (13/65 in group 1, 276/55 in group 2, 83/17 in group 3) were interviewed to diagnose anxiety disorder. All the children (and their parents) in group 4 (26), in which neither the child nor the parent reported anxiety on SCARED screening, were interviewed. The percentage of children with anxiety disorder on interview was highest when both the child and parent SCARED screening

score was $\geq$ 25 (84.61%) and lowest when both the child and parent SCARED screening score was $\leq$ 25(3.85%). In group 2, in which the child SCARED screening score was $\geq$ 25 but the parent SCARED screening score was $\leq$ 25, 69.09% of children did not have anxiety on interview (Table 4).

The sensitivity, specificity, positive and negative predictive value of the SCARED screening test of the child is 82.35, 48.05, 41.18 and 86.05, respectively. The sensitivity, specificity, positive and negative predictive value of the SCARED screening test of the parent is 47.06, 81.82, 53.33 and 77.78, respectively. The net sensitivity of the combined SCARED screening test of the child and parent in series is 39.29 % and the net specificity is 95.00%. The net positive and negative predictive value of the combined SCARED screening test of the child and parent in series are 84.60 % and 69.09%. The net sensitivity, specificity, net positive and negative predictive value of the combined SCARED screening test of the child and parent in parallel are 83.33%, 67.57%, 29.40% and 96.10% respectively. The prevalence of anxiety disorder in the sample is 36.67 % (165/450) (Table 5).

The most common anxiety disorder diagnosed by interview was Generalized Anxiety Disorder (16/111, 14.42%) while none of the subjects interviewed had school avoidance. Panic Disorder was the most common anxiety disorder detected on SCARED screening reported by children (167/450, 37.11%) and school avoidance was the least common (63/450, 14.00%) detected anxiety disorder (Table 6).

The relation between anxiety and gender was not significant in our study, (1, N = 111) = 3.50, p = .061. There was no significant relationship between anxiety disorder and educational class of children ($\chi^2$ (1, N=111) = 2.24, p = .135), family type ($\chi^2$ (1, N=111) = 1.33, p = .248), mother's education level ($\chi^2$ (1, N=111) = 1.76, p = .185), father's education level ($\chi^2$ (1, N=111) = 1.36, p = .243), parent's employment status ($\chi^2$ (1, N=111) = 2.39, p = .087) or number of siblings ($\chi^2$ (1, N=111) = 0.103, p = .748) (Table 7).

## Discussion

In our study population, 36.7% of the children studying in secondary school (std. 5th to 10th) had an anxiety disorder. Lewinsohn et al. reported a lifetime prevalence of anxiety to be 27% (Lewinsohn et al., 1998). Brady et al. and Kessler et al. reported rates of anxiety disorder in children to be around

**Table 4. Number of children (and their parents) interviewed in each study group and found to have anxiety disorder**

| Group | Child SCARED reporting | Parent SCARED reporting | Number of children Screened | Number of children (and their parents) interviewed | Number (percentage) of children with Anxiety disorder on interview |
|---|---|---|---|---|---|
| 1 | + | + | 65 | 13 | 11 (84.61) |
| 2 | + | – | 276 | 55 | 17 (30.91) |
| 3 | – | + | 83 | 17 | 5 (29.41) |
| 4 | – | – | 26 | 26 | 1 (3.85) |
| | | | 450 | 111 | 34 (30.63) |

**Table 5. Calculation of the number of subjects in the entire sample (450 subjects) with anxiety disorder using net predictive value of combined parent and child SCARED screening test in series and parallel**

| Group | Child SCARED reporting | Parent SCARED reporting | Number of children Screened | Number of children with anxiety disorder on interview | Predictive value of combined child and parent SCARED screening test in series | Predictive value of combined child and parent SCARED screening test in parallel | Number of children with anxiety disorder in entire screened group |
|---|---|---|---|---|---|---|---|
| 1 | + | + | 65 | 11 | PPV=84.6 | | 55 |
| 2 | + | – | 276 | 17 | NPV=69.09 | | 85 |
| 3 | – | + | 83 | 05 | | PPV=29.4 | 24 |
| 4 | – | – | 26 | 01 | | NPV=96.1 | 01 |
| Total | | | 450 | | | | 165 (36.7%) |

PPV= positive predictive value, NPV= negative predictive value

25% (Brady et al., 2000; Kessler et al., 1994).Epidemiological studies using DSM III-R diagnostic criterion demonstrated that between 15 to 23 % of all children may meet criteria for some anxiety disorder (Kashani & Orvaschel, 1988; King, Gullone et al., 1993; Milne et al., 1995). Other epidemiological studies have reported lower prevalence of pediatric anxiety disorders affecting 6 to 18% of children and adolescents (Bernstein & Shaw, 1997; E Jane Costello et al., 2003; Velosa & Riddle, 2000). Review of the existing epidemiological evidence shows that lifetime estimates of any anxiety disorder in pediatric population can range from 14 or 15% (Warren et al., 1997; Wittchen et al., 1998).

The SCARED screening test reported by the child had a high sensitivity (82.35%) and low specificity (48.05%). In contrast, the SCARED screening test reported by the parent had a low sensitivity (47.06%) and high specificity (81.82%). On combining the SCARED screening test of the child and parent in series, the net sensitivity dropped to 39.29 % while the net specificity increased to 95.00%. On combining the SCARED screening test of the child and parent in parallel, the net sensitivity increased to 83.33% while the net specificity decreased to 67.57%. Thus, when both the parent and child SCARED score was $\geq$25, there was 84.6 % chance that the child will have anxiety disorder detected on interview. Simon and Bogels conducted a study in 2009 to examine the usefulness of screening for anxiety disorders

**Table 6. Type of anxiety disorder in the study population**

| Type of anxiety disorder | Number (%), based on the interview (n=111) | Number (%), based on SCARED score reported by children (n=450) |
|---|---|---|
| Generalised anxiety disorder | 16 (14.41) | 123 (27.33) |
| Social anxiety disorder | 15 (13.51) | 115 (25.56) |
| Panic disorder | 12 (10.81) | 167 (37.11) |
| Separation anxiety disorder | 5 (4.50) | 276 (61.33) |
| School avoidance (DSM-IV TR Simple phobia) | 0 (0.0) | 63 (14.00) |

and ability of screening methods to predict anxiety disorders in primary school children (Simon & Bogels, 2009). In their study, children and their parents were selected if the children had self-reported scores on the screening questionnaire Screen for Child Anxiety Related Emotional Disorders-71 (SCARED-71) within the High-anxious or Median-anxious range. Of the selected children, 183 high-anxious children and their parents, and 80 median-anxious children and their parents took part in a diagnostic interview. Of the high-anxious children, 60% had an anxiety disorder versus 23% of the median-anxious children. He concluded that the screening method has proven its utility for discriminating between children with and without anxiety disorders when applying the top-15% cut-off. Monga et al. concluded that SCARED is a reliable and valid screening tool for clinically referred children and adolescents with anxiety disorders (Monga et al., 2000).Further, conclusions by Birmaher et al. implied that, although SCARED shows promise as a screening instrument for anxiety disorders, future studies using the SCARED in community samples are indicated (Birmaher et al., 1999).

The National Comorbidity Survey, which included individuals ranging from 15 to 54 years old, provided GAD prevalence rates from 1.6% current to 5.1% lifetime (Wittchen et al.,1994).Data from the Great Smoky Mountains Study, a large epidemiological and longitudinal study of childhood psychiatric disorders suggest lower prevalence rates for GAD i.e. 0.3% for 9-12 year olds and 0.7% for 13-16 year olds (E J Costello et al., 1996).The prevalence rate for GAD in our study is higher (14.41) than most published studies. The probable reason could be the use of latest DSM IV-TR criteria for diagnosis on clinical interview compared to DSM III-R used in previous studies. In our study, 13.51 % of children had Social Anxiety Disorder. Estimates of prevalence rates for Social Anxiety Disorder have been very variable. In clinical settings, rates of childhood social phobia have been found to range from 29–40%, making it one of the more commonly seen child anxiety disorders (Hammerness et al., 2008; Kendall & Warman, 1996). On the other hand, the rate of lifetime social anxiety disorder in community samples of adolescents was found to be 1.6% (Essau et al., 1999; Last et al., 1992).Panic Disorder was found in 10.81% of children in our study. Masi et al. reported that 10.4% of the subjects,

**Table 7. Relationship of demographic variables with anxiety disorder in the interviewed subjects (n=111)**

| Variable | | Anxiety Frequency (%) | No Anxiety Frequency (%) | Total Frequency (%) | p |
|---|---|---|---|---|---|
| Gender | Boys | 12 (35.29) | 42 (54.54) | 54 (48.65) | .06 |
| | Girls | 22 (64.71) | 35 (45.56) | 57 (51.35) | |
| Child educational Class | 5–7 std. | 22 (64.70) | 38 (49.35) | 60 (54.05 ) | .14 |
| | 8–10 std. | 12 (35.3) | 39 (50.65) | 51 (45.95) | |
| Family type | Nuclear | 33 (97.06) | 70 (90.91) | 103 (92.79) | .25 |
| | Joint | 1 (2.94) | 7 (9.09) | 8 (7.21) | |
| Parent's education level | | | | | |
| Father | <10th | 0 (0.00) | 3 (3.90) | 3 (2.70) | .24 |
| | >10th | 34 (100.00) | 74 (96.10) | 108 (97.30) | |
| Mother | <10th | 1 (2.94) | 8 (10.39) | 9 (8.11) | .19 |
| | >10th | 33 (97.06) | 69 (89.61) | 102 (91.89) | |
| Parents' employment status | Both parents working | 13 (38.23) | 43 (55.84) | 56 (50.45) | .09 |
| | Only father working | 21 (61.77) | 34 (44.26) | 55 (49.55) | |
| Number of siblings | None or 1 | 21 (61.76) | 50 (64.93) | 71 (63.96) | .75 |
| | ≥ 2 | 13 (38.24) | 27 (35.17) | 40 (36.04) | |

Std = standard or grade i.e. 1st grade or 1st standard, 10th = 10th grade

aged 7 to 18 years, fulfilled DSM-IV criteria for PD (Masi et al., 2000). Last et al. also reported that up to 10% of youth have a diagnosis of Panic Disorder (Last et al., 1992). Studies based on community samples estimate prevalence rates for Panic Disorder in youth at less than 1% (Essau et al., 2000; Hayward et al., 2000; Hayward et al., 2003; Verhulst et al., 1997; Whitaker et al., 1990). The variation in the rates of reporting can be explained on the basis differences in age ranges of the sample and varying methods of assessment. In our study, 4.5 % of children had Separation Anxiety Disorder. A lifetime prevalence estimate of childhood separation anxiety disorder was reported as 4.1% by Shear et al. in 2006 (Shear et al., 2006). Most epidemiological studies indicate a prevalence rate of 3% to 5% for SAD in children and adolescents which are consistent with our findings (Anderson et al., 1987; Bird et al., 1988; Costello, 1989; Prior et al., 1999). Heimberg et al. and Lewinsohn et al. concluded that Separation Anxiety Disorder is quite common among adolescents, with lifetime prevalence rates of between 5 to 15% in the United States (Heimberg et al., 2000; Lewinsohn et al., 1993). None of the children in our study had School avoidance behavior. Reviews of school refusal suggest that approximately 1% of nonclinic-referred children exhibit school refusal (Burke & Silverman, 1987; Granell de Aldaz et al., 1984; King et al., 1993). Since school avoidance / school refusal is not included in DSM-IV TR, diagnosis of this entity becomes variable.

The mean age of children with anxiety disorders in our study was 11.2 years. The mean age of onset for an anxiety disorder is 11 as reported by Kessler et al. in 2005 (Kessler et al., 1994). Among children with anxiety disorders, 64.7% were girls and 35.3% were boys. Though more girls had anxiety

disorder in our study, it was not found to be statistically significant (p= .061). The demographic feature reported to be most clearly related to anxiety is gender, with females demonstrating almost twice the risk of males (Costello et al., 2003; Essau et al., 2000; Lewinsohn et al., 1997).

On the other hand, some population studies have failed to demonstrate significant sex differences in prevalence of anxiety disorders (Canino et al., 2004; Ford et al., 2003). Among children with anxiety disorder in our study, 35.3% of were from Class 8, 9 and 10 (age = 13-15 years) while 64.7% of children belonged to class 5, 6 and 7 (age= 10-12 years) (p = 0.13). Costello et al. reported 15.4% of anxiety disorders in children between 7-11 years while they reported rates of 5.7% between 11-13years (Costello et al., 1996). Gau et al. also reported decreasing rates of anxiety with increasing age; rates of 9.2%, 7.4% and 3.1% for seventh, eighth and ninth grades respectively (Gau et al., 2005). Breton et al. reported the rate of anxiety disorders as 9.2%, 5.8% and 12.2% for age groups 6-8 years, 9-11 years and 12-14 years respectively (Breton et al., 1999).In children with anxiety disorders, 97.1% belonged to nuclear families whereas in children without anxiety disorders 90.9% belonged to joint families (p= .24). Anxiety does not appear to be consistently related to family size (Canino et al., 2004; Ford et al., 2004; Lewinsohn et al., 1997). This finding could representative of the general population where most families today are nuclear. The education level of the parents was not significantly associated with anxiety disorder in our study. Anxiety has not been reported to be consistently related to parent's education level (Canino et al., 2004; Ford et al., 2004; Lewinsohn et al., 1997).

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