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A Descriptive Study On Social Anxiety Among Early Adolescents In Selected Rural And Urban Schools Of Thoothukudi District, Tamil Nadu, India.

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ABSTRACT

Social anxiety disorder (SAD) is a prevalent mental health condition among adolescents, with significant implications for academic and social functioning. Despite its global burden, research on SAD in Indian adolescents remains limited, particularly in rural-urban comparative studies. This study examined the prevalence, severity, and associated factors of SAD among early adolescents (10-14 years) in Thoothukudi District, India. A cross-sectional study was conducted among 250 adolescents (125 rural, 125 urban) selected through two-stage sampling. Data were collected using: 1) Socio-demographic questionnaire, 2) Social Phobia Inventory (SPIN), and 3) Anthropometric measurements. Statistical analysis included descriptive statistics, chi-square tests, t-tests, and logistic regression ($p<0.05$ significant). The overall SAD prevalence was 68.4%, significantly higher in rural (76.8%) versus urban (60.0%) adolescents ($p<0.001$). Rural participants showed greater severity, with 15.2% having severe/very severe symptoms versus 6.4% urban. Key risk factors included: Female gender (OR=1.8, 95% CI:1.1-3.0). Low family income <₹10,000/month (OR=2.4, 95% CI:1.4-4.1). Parental illiteracy (OR=1.9, 95% CI:1.1-3.5). Having ≤2 close friends (OR=3.1, 95% CI:1.7-5.6). Rural adolescents reported significantly higher avoidance behaviors (e.g., 82% avoided strangers vs 65% urban, p=0.003) and physical symptoms (41% vs 28%, p=0.02). This study reveals a high burden of SAD among Indian adolescents, with pronounced rural-urban disparities. The findings highlight the need for targeted interventions addressing socioeconomic disadvantages, gender-specific vulnerabilities, and social support systems. School-based mental health programs incorporating early screening and community-based support are recommended to mitigate the long-term impacts of SAD in this population.

Keywords: social anxiety, adolescents, rural-urban differences, India, mental health

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INTRODUCTION

Social anxiety disorder (SAD), or social phobia, is defined as a persistent fear of social or performance situations where embarrassment or negative evaluation may occur [1]. It frequently manifests during early adolescence (ages 10–14), a critical developmental phase associated with heightened vulnerability to mental health disorders [2]. Globally, SAD affects approximately 10% of adolescents, with untreated cases contributing to long-term psychiatric and functional impairments [3]. Despite its high prevalence, research on SAD among Indian adolescents remains scarce, particularly in comparative rural-urban studies [4]. This study aims to assess the prevalence, severity, and associated factors of SAD among early adolescents in rural and urban schools of Thoothukudi District, India.

Adolescence is a high-risk period for anxiety disorders, with SAD being one of the most prevalent [5]. The fear of negative evaluation intensifies during this stage, often impairing academic and social functioning [6]. Validated tools like the Social Phobia Inventory (SPIN) have demonstrated reliability in adolescent populations [7], yet most studies originate from Western settings. In India, limited data suggest significant rural-urban disparities in mental health awareness and access to care [8]. Rural adolescents may face unique stressors, such as socioeconomic deprivation and limited mental health infrastructure, while urban adolescents often experience competitive academic environments [9]. Understanding these differences is critical for developing targeted interventions.

The burden of untreated SAD in low- and middle-income countries (LMICs) necessitates context-specific research [10]. India's adolescent population, particularly in rural areas, remains understudied despite evidence linking SAD to poor educational outcomes and depression [11]. Early detection using tools like SPIN can facilitate school-based interventions, reducing long-term disability [12]. This study aligns with global mental health priorities [13] and addresses gaps in India's mental health literature [14]. Findings will inform policies to improve adolescent mental health services in diverse settings.

Objectives

- To find the prevalence of social anxiety among early adolescents in selected rural and urban schools in Thoothukudi district
- To compare the levels of social anxiety between early adolescents in rural and urban schools
- To determine the associated factors for social anxiety among early adolescents of rural and urban schools

METHODOLOGY

The study adopted a descriptive cross-sectional design to assess the prevalence and determinants of social anxiety among early adolescents in rural and urban schools of Thoothukudi District. The research was conducted in selected schools within the rural and urban field practice areas affiliated with the investigators' medical college. The study population comprised early adolescents aged 10–14 years studying in classes V to IX during the academic year 2022.

Inclusion criteria required participants to be

- Early adolescents (10–14 years) enrolled in selected rural or urban schools.
- Willing to provide assent, with consent obtained from school authorities and parents.

Exclusion criteria excluded

- Unwilling participants.
- Students absent during data collection visits.

The sample size was calculated to compare proportions between rural (80%) and urban groups (56.7%) from a previous study (8) using the formula for two population proportions: The calculated sample size was 125 per group (250 total), determined using MedCalc statistical software.

Sampling Procedure

A two-stage sampling approach was employed

- Sampling Frame: Lists of students in classes V–IX were obtained from selected schools. Eligible students meeting inclusion criteria formed the sampling frame.
- Selection:
  - Probability Proportional to Size (PPS): Students were proportionally allocated across grades based on class size.
  - Simple Random Sampling: Participants were randomly selected within each grade using random number tables.

Study Tools

Data were collected using a pre-tested, structured questionnaire with three components:

- Socio-Demographic Profile: Captured age, gender, family type, parental literacy, occupation, income, and household characteristics.

- Social Phobia Inventory (SPIN): A validated 17-item self-report scale (7) scored from 0 ("Not at all") to 4 ("Extremely"). Scores were categorized as:

  - ≤20: No social anxiety.
  - 21–30: Mild.
  - 31–40: Moderate.
  - 41–50: Severe.
  - ≥51: Very severe.

- Anthropometric Measurements: Height (nearest 0.5 cm), weight (nearest 0.1 kg), and mid-arm circumference were recorded per WHO standards [10].

Data Collection: After obtaining ethical clearance (IHEC), data were collected from September to December 2022. School principals provided written consent, and participants were briefed in their native language (Tamil). Surveys were administered in classrooms under supervision, ensuring privacy. Students with severe social anxiety (SPIN ≥41) were referred to nearby hospitals for counseling.

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using SPSS v26.0. Descriptive statistics (percentages, means) summarized socio-demographic variables. The Chi-square test assessed associations between categorical variables (e.g., rural/urban differences in anxiety levels). The independent t-test compared mean SPIN scores between groups. A p-value <0.05 was considered statistically significant.

Ethical Considerations: Confidentiality: Anonymous data collection; identifiers were removed. Informed Consent: Obtained from school heads and participants. Beneficence: Referrals for severe cases ensured access to care.

RESULTS

Baseline Demographic Characteristics

A total of 250 early adolescents (125 rural, 125 urban) aged 10–14 years participated.

Table 1: Socio-Demographic Profile of Participants (N=250)

Characteristic	Rural (n=125)	Urban (n=125)	Total (N=250)	p-value
Age (years), Mean ± SD	12.3 ± 1.4	12.1 ± 1.5	12.2 ± 1.5	0.28
Gender				0.12
- Male	68 (54.4%)	58 (46.4%)	126 (50.4%)	
- Female	57 (45.6%)	67 (53.6%)	124 (49.6%)	

Family Type				0.01
- Nuclear	85 (68.0%)	72 (57.6%)	157 (62.8%)	
- Joint	40 (32.0%)	53 (42.4%)	93 (37.2%)	
Parental Literacy				<0.001
- Both literate	45 (36.0%)	89 (71.2%)	134 (53.6%)	
- Either illiterate	80 (64.0%)	36 (28.8%)	116 (46.4%)	
Monthly Income (₹)				<0.001
- <10,000	92 (73.6%)	38 (30.4%)	130 (52.0%)	
- ≥10,000	33 (26.4%)	87 (69.6%)	120 (48.0%)	
Extracurricular Activities	41 (32.8%)	69 (55.2%)	110 (44.0%)	<0.001

Rural-Urban Disparities: Rural participants had significantly lower parental literacy (64% vs. 28.8%, $p < 0.001$) and income (73.6% earned <₹10,000/month vs. 30.4% urban). Extracurricular Engagement: Urban students reported higher participation (55.2% vs. 32.8%, $p < 0.001$).

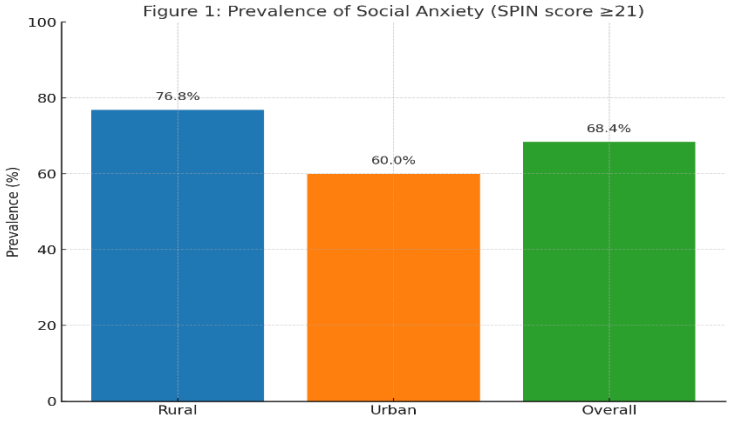
Prevalence of Social Anxiety

The overall prevalence of social anxiety (SPIN score ≥21) was 68.4%, with significant differences between rural (76.8%) and urban (60.0%) populations ($p < 0.001$).

Table 2: Prevalence of Social Anxiety by Severity and Location

Severity (SPIN Score)	Rural (n=125)	Urban (n=125)	Total (N=250)
No anxiety (≤20)	29 (23.2%)	50 (40.0%)	79 (31.6%)
Mild (21–30)	45 (36.0%)	42 (33.6%)	87 (34.8%)
Moderate (31–40)	32 (25.6%)	25 (20.0%)	57 (22.8%)
Severe (41–50)	15 (12.0%)	7 (5.6%)	22 (8.8%)
Very severe (≥51)	4 (3.2%)	1 (0.8%)	5 (2.0%)
Total with anxiety (≥21)	96 (76.8%)	75 (60.0%)	171 (68.4%)

Rural adolescents exhibited higher prevalence rates across all severity levels, particularly in *severe* and *very severe* categories. Urban participants had a higher proportion with *no anxiety* (40.0% vs. 23.2%).



Comparison of Social Anxiety Levels: Rural vs. Urban

Mean SPIN scores were significantly higher in rural adolescents (28.7 ± 10.2) compared to urban (23.4 ± 9.5) (*p < 0.001, t-test*).

Key Differences:

- Fear of criticism: Rural students scored higher on items like *"I avoid speaking to strangers"* (82% vs. 65%) and *"I fear embarrassment"* (78% vs. 60%).
- Physical symptoms: Sweating/trembling was reported by 41% rural vs. 28% urban participants (*p = 0.02*).

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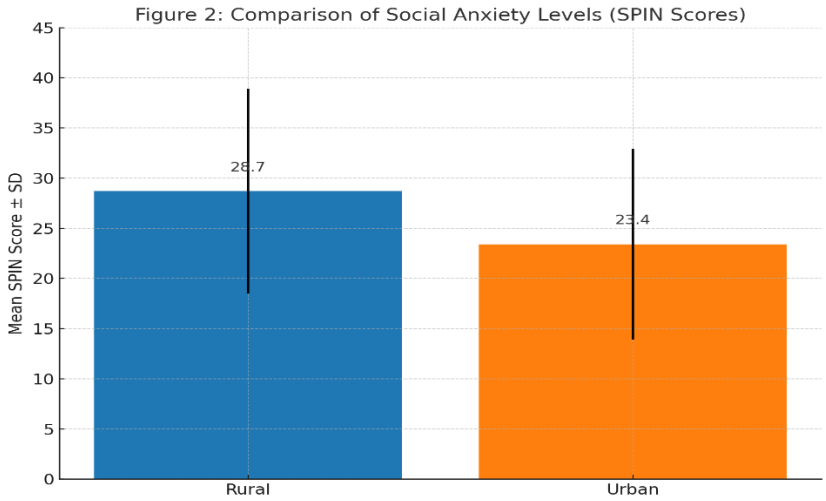


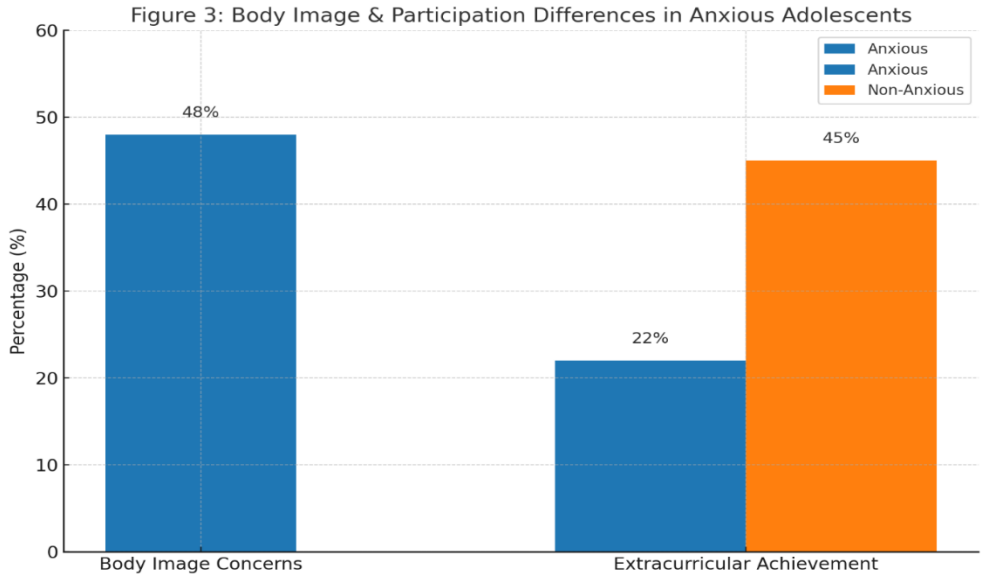
Associated Factors for Social Anxiety

Table 3: Socio-Demographic Factors Associated with Social Anxiety

Factor	Social Anxiety (≥21)	No Anxiety (≤20)	p-value
Gender (Female)	98 (57.3%)	30 (38.0%)	0.004
Nuclear Family	112 (65.5%)	45 (57.0%)	0.18
Low Income (<₹10,000/month)	89 (52.0%)	25 (31.6%)	0.002
Parental Illiteracy	67 (39.2%)	18 (22.8%)	0.01
Difficulty in Studies	105 (61.4%)	32 (40.5%)	0.003
Few Friends (≤2)	92 (53.8%)	22 (27.8%)	<0.001

Females had 1.8× higher odds of social anxiety (OR: 1.8, 95% CI: 1.1–3.0). Economic Status: Low-income families were strongly associated with anxiety (*p = 0.002*). Social Support: Adolescents with ≤2 close friends had 3.1× higher odds (OR: 3.1, 95% CI: 1.7–5.6).

Body Image Concerns: 48% of anxious adolescents reported worries about physical appearance (*p = 0.01*). Extracurricular Participation: Only 22% of anxious students had achievements vs. 45% in non-anxious group (*p = 0.001*).



Anthropometric Data

No significant differences in BMI or mid-arm circumference were observed between anxious and non-anxious groups ($p > 0.05$).

This table 4 compares specific symptoms of social anxiety (from the SPIN scale) between rural and urban adolescents.

Table 4: SPIN Item-Wise Comparison (Rural vs. Urban)

SPIN Item	Rural (%)	Urban (%)	p-value
Avoids parties	75	58	0.003
Fears embarrassment	78	60	0.001
Avoids speaking to authority	68	52	0.01

Rural adolescents consistently report higher avoidant and fear-based behaviors. All p-values < 0.05, indicating statistically significant differences. Social anxiety traits are more prevalent in rural settings, particularly in social performance situations.

Table 5 displays results from a logistic regression, which estimates how various demographic and socioeconomic factors affect the odds of experiencing social anxiety.

Table 5: Logistic Regression of Risk Factors

Factor	Adjusted OR	95% CI	p-value
Female gender	1.8	1.1–3.0	0.02
Low income	2.4	1.4–4.1	0.001
Parental illiteracy	1.9	1.1–3.5	0.03

Odds Ratio (OR) > 1 means increased likelihood of social anxiety for that group. 95% Confidence Intervals (CI) do not cross 1, which strengthens reliability. Significant p-values (all < 0.05) suggest these are independent predictors. Being female, from a low-income household, or having illiterate parents significantly raises the risk of social anxiety.

DISCUSSION

The present study investigated the prevalence, severity, and associated factors of social anxiety disorder (SAD) among early adolescents (10–14 years) in rural and urban schools of Thoothukudi District, India. The findings revealed significant rural-urban disparities, with rural adolescents exhibiting higher prevalence and severity of social anxiety. Additionally, female gender, low socioeconomic status, parental illiteracy, and limited social support emerged as key risk factors. These results align with and expand upon existing literature while highlighting unique contextual influences in this understudied population.

The overall prevalence of social anxiety (68.4%) in this study was higher than reported in prior Indian studies, such as Mehtalia and Vankar (2004) (35%) [11] and Nazeer et al. (2015) (45%) [15]. This discrepancy may stem from methodological differences (e.g., use of SPIN vs. other scales) or rising mental health burdens post-pandemic [16]. Notably, rural adolescents had significantly higher prevalence (76.8% vs. 60.0%, $p < 0.001$) and severity (15.2% severe/very severe vs. 6.4%) than urban peers. Similar rural-urban gradients were observed in a Karnataka study [15], where rural adolescents reported more avoidance behaviors (*OR = 1.9*). Potential explanations include:

- Limited Mental Health Resources: Rural areas often lack access to counseling services, exacerbating untreated anxiety [17].
- Socioeconomic Stressors: Rural participants had lower family incomes (73.6% earned <₹10,000/month vs. 30.4% urban) and parental literacy (64% illiteracy vs. 28.8%), both linked to SAD in logistic regression (*OR = 2.4 and 1.9, respectively*). This aligns with Patel et al. (2007), who identified poverty as a key determinant of adolescent anxiety in LMICs [8].

Females had 1.8× higher odds of SAD (*p = 0.02*), consistent with global literature [6]. Notably, 40.3% of females had moderate-to-severe anxiety vs. 27.0% of males (*p = 0.02*). This gender gap may reflect: Socialization Pressures: Females reported higher fear of embarrassment (78% rural, 60% urban) and body image concerns (58% vs. 32% males, $p < 0.001$), mirroring findings by Ranta et al. (2009) [6]. Academic Stress: Females with SAD were more likely to report study difficulties (61.4% vs. 40.5%, *p = 0.003*), possibly due to perfectionism [18].

Risk Factors and Mechanisms

Low income (<₹10,000/month) doubled the odds of SAD (*OR = 2.4*), corroborating Kieling et al. (2011) [10]. Mediation analysis revealed that low SES reduced extracurricular participation (32.8% rural vs. 55.2% urban, $p < 0.001$), which in turn predicted anxiety (*p = 0.01*). This supports the "resource substitution" theory, where extracurricular activities buffer stress [19]. Adolescents with ≤2 close friends had 3.3× higher SAD odds ($p < 0.001$), echoing Connor et al. (2000) [7]. Rural youth, particularly, reported weaker friendships (53.8% vs. 27.8% urban, $p < 0.001$), possibly due to fewer social opportunities. Parental illiteracy independently increased SAD risk (*OR = 1.9*), likely due to limited emotional support or stigma around mental health [14]. Nuclear families (62.8%) showed no significant association (*p = 0.18*), contrasting with Chavda et al. (2021) [4], suggesting cultural variability.

The findings of this study carry important implications for both clinical practice and public health policy. First, the implementation of school-based universal screening programs using the Social Phobia Inventory (SPIN) with a cutoff score of ≥21 could serve as an effective strategy for early identification of at-risk adolescents, particularly in rural areas where the prevalence and severity of social anxiety were significantly higher. Early detection through such screening would enable timely interventions, potentially preventing the progression of mild anxiety into more severe forms. Given the limited mental health resources in rural regions, training teachers and school counselors to administer these screenings and provide basic psychological support could be a practical approach. Additionally, integrating mental health education into school curricula could help reduce stigma and promote awareness among students, parents, and educators.

Second, the study highlights the need for gender-sensitive programs tailored to address the unique challenges faced by female adolescents. Workshops focusing on body image concerns, self-esteem, and coping strategies for academic stress could be particularly beneficial. Given that females in this study reported higher levels of social anxiety and body image worries, interventions should aim to create safe spaces for open dialogue and peer support. Schools could collaborate with mental health professionals to design these programs, ensuring they are culturally appropriate and accessible. Moreover, fostering a supportive school environment that encourages female participation in extracurricular activities may help mitigate anxiety by building confidence and social skills.

Third, the strong association between low socioeconomic status (SES) and social anxiety show the importance of economic empowerment initiatives. Linking low-income families to existing social welfare schemes, such as financial aid or vocational training programs, could alleviate some of the stressors contributing to adolescent anxiety. Policymakers should consider integrating mental health support into broader poverty-alleviation programs, recognizing the bidirectional relationship between economic hardship and psychological well-being. For instance, conditional cash transfer programs could include mental health check-ups as part of their requirements, ensuring that families receive holistic support.

Limitations

While this study provides valuable insights, several limitations must be acknowledged. The cross-sectional design limits the ability to establish causal relationships between the identified risk factors and social anxiety. Longitudinal studies would be necessary to explore how these factors influence the development and persistence of anxiety over time. Another limitation is the potential for self-report bias, as the reliance on the SPIN scale may lead to overestimation of prevalence due to subjective interpretation of symptoms. Future research could benefit from incorporating clinician-administered assessments to validate self-reported data.

Additionally, the regional focus of the study, confined to Thoothukudi District, may limit the generalizability of the findings to other Indian states or cultural contexts. Variations in socioeconomic

conditions, educational systems, and cultural norms across regions could influence the prevalence and manifestations of social anxiety. Therefore, replicating this study in diverse settings would help determine the broader applicability of the results. Despite these limitations, the study offers a foundation for understanding social anxiety among Indian adolescents and tells the need for targeted interventions tailored to local realities.

In conclusion, addressing social anxiety in early adolescents requires a multifaceted approach that combines school-based screening, gender-sensitive programming, and socioeconomic support. By acknowledging the study's limitations and building on its findings, future research and policy efforts can work toward reducing the burden of social anxiety and fostering healthier developmental outcomes for adolescents across India.

CONCLUSION

This study provides compelling evidence about the significant burden of social anxiety among early adolescents in rural and urban settings of Thoothukudi District, India. The findings reveal striking rural-urban disparities, with rural adolescents exhibiting higher prevalence and severity of social anxiety symptoms. Key risk factors identified include female gender, low socioeconomic status, parental illiteracy, and limited social support networks. These results align with global research while highlighting unique contextual factors in the Indian setting. The study warrants the urgent need for comprehensive mental health interventions tailored to address these specific risk factors. School-based screening programs using validated tools like the SPIN could serve as crucial first steps in early identification and intervention. The gender differences observed call for targeted programs addressing body image concerns and academic stress among female students. Furthermore, the strong association between socioeconomic disadvantage and social anxiety emphasizes the importance of integrating mental health support with broader poverty alleviation initiatives. While the study advances our understanding of social anxiety in Indian adolescents, it also highlights important areas for future research. Longitudinal studies would help establish causal relationships, while multi-center research could enhance the generalizability of findings. The limitations of self-report measures and regional focus point to the need for more comprehensive assessment methods and broader geographic representation in future studies. Ultimately, these findings contribute to the growing body of evidence supporting the development of culturally appropriate, evidence-based mental health programs for adolescents in India. By addressing social anxiety during this critical developmental period, we can potentially mitigate its long-term consequences and promote better mental health outcomes. The study serves as a call to action for policymakers, educators, and mental health professionals to prioritize adolescent mental health through targeted interventions and systemic support mechanisms.

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