

# Mental Health Problems among Urban and Rural School-Going Adolescents in Kurnool District, South India: A Comparative Cross-Sectional Study

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## ABSTRACT

**Introduction:** One of the most important stages of human development is adolescence. Adolescents frequently have modest psychological issues, such as friendship or school-related anxiety. These problems are made worse by a lack of knowledge about the signs and symptoms of mental diseases. Some of these issues can be avoided before they develop by encouraging adolescents to have good mental wellness.

**Objectives:** To assess & compare mental health status of adolescents enrolled in schools of Kurnool Medical college rural and urban field practice regions.

**Methodology:** A School-based cross-sectional study was conducted among 416 Adolescents between the ages of 10 to 19 who lived in Kurnool Medical College's urban and rural field practice regions by simple random sampling, using a semi-structured questionnaire covering socio-demographic details, Strengths and Difficulties Questionnaire (SDQ). IBM SPSS (version 21) was used for data analysis.

**Results:** Majority of adolescents belonged to the 10-15 years age group in both urban (76.92%) & rural regions (79.32%). The prevalence of abnormal mental health issues was determined to be 0.48% in urban regions and 1.44% in rural regions determined by the total difficulties score. In comparison to urban settings, there appeared to be somewhat more mental health problems in rural settings.

**Conclusion:** Overall total difficulties score did not differ significantly between urban and rural adolescents, rural regions had significantly higher scores for emotional, conduct, hyperactivity problems. These results emphasise the necessity of school-centered mental wellness services.

**Keywords:** Adolescent, Mental Health, Rural Population, Urban Population, Surveys and Questionnaires, Cross-Sectional Studies

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## INTRODUCTION

Individuals aged between 10 to 19 are classified as adolescents by the World Health Organization. More than 360 million adolescents, or 20% of the total demographics, live in the Southeast Asia Region (SEAR) countries.[1] With 253 million adolescents between the ages of 10 to 19, India has the highest adolescent demographic profile in the entire globe. In India, adolescents make about one in five people.[2]

In order to secure their development into healthy adults, People in this demographic range require adequate nourishment, counselling, education, and guidance because they are at a transitional period of life. Early and unwanted pregnancy, risky sexual behaviour that can lead to STIs, HIV/AIDS, nutritional disorders such as obesity, anaemia, and malnutrition, substance misuse, alcohol and tobacco use, mental health issues, injuries, and violence are just a few of the avoidable and manageable health issues that adolescents are susceptible to.[3]

Adolescents are particularly vulnerable to stress, tension, and anxiety because of significant hormonal changes and shifting social attitudes throughout this developmental time. Due to the rapid interaction of hormonal and psychophysical transitions, adolescence is a time of heightened vulnerability to mental health disorders. Mental health issues account for about 16% of worldwide burden of disease and injury among people between the ages of 10-19. Surprisingly, more than half of these mental health conditions start before reaching 14 years of age.[4]

Adolescents may have new difficulties and dysfunctional symptoms throughout important transitions like going from school to college. Excessive social and educational pressure might lead to unpleasant emotional states and more internalising issues.[5] Positive results can be attained with early detection and prompt action.[6]

Depressive and anxious disorders are the two most widespread mental health conditions among adolescents.[5,7] Adolescent substance misuse, online addiction and cell phone addiction are also becoming major public health issues.[8] Thus, this study's aim is to evaluate adolescent's mental health in both rural and urban settings.

## MATERIALS AND METHODS

A cross-sectional study was carried out between March 2023 - September 2024, in schools. Adolescent girls and boys between the ages of 10 and 19 who lived in Kurnool Medical College's urban and rural field practice regions in Kurnool, South India, made up the study population.

Out of the 305 schools in the Kurnool district, four government schools educate students in grades 6 to 10 and are situated inside the field practice areas of Kurnool Medical College. Students enrolled in these schools' 7th

to 10th grades were included in the current study. Two government high schools in Kurnool Medical College's rural field practice region and two government high schools in its urban field practice region provided the data. Using a simple random sample technique, students between the ages of 10 to 19 were chosen from each school.

The sample size was calculated using the formula for comparison of two independent proportions:  $n = [Z\alpha/2\sqrt{(2PQ)} + Z\beta\sqrt{(P_1Q_1 + P_2Q_2)}]^2 / (P_1 - P_2)^2$ , where  $P = (P_1 + P_2)/2$  and  $Q = 1 - P$ . Based on a previous study by Prakash GH et al. [9], the prevalence of common mental disorders among adolescents was 39.3% in rural areas ( $P_1 = 0.393$ ) and 24.2% in urban areas ( $P_2 = 0.242$ ). Assuming a two-sided  $\alpha$  of 0.05 ( $Z\alpha/2 = 1.96$ ) and 80% power ( $Z\beta = 0.84$ ), the minimum required sample size was 148 participants per group. After allowing for a 19% non-response rate, the adjusted sample size was  $148/(1-0.19) = 182.7$ , rounded to 183 participants per group. To ensure adequate representation and facilitate balanced recruitment from both study areas, the sample size was further increased to 208 participants per group, resulting in a final sample of 416 adolescents.

208 participants were chosen from the rural field practice region and 208 from the urban field practice region under the Department of Community Medicine, Kurnool Medical College, because this was a comparative cross-sectional study. The study comprised adolescent girls and boys between the ages of 10 to 19 who were enrolled in the 7th to 10th grades at the chosen schools and whose parents gave their permission to participate.

Adolescents who were absent throughout the investigation period and adolescents who were extremely ill and adolescents who declined to provide assent for participation were all excluded from the study. The Institutional Ethics Committee approved the study (IEC No. 209/2023). Dates for the student interviews were set with approval from the school administration. To get the necessary sample size of 208, participants were chosen at random from each field practice location.

Class-wise lists of eligible students were obtained from the selected schools. The roll numbers of eligible students were entered into Microsoft Excel. Random number were generated using the Excel RAND function, and the students were sorted according to the generated random numbers. After that, students were chosen one after the other without replacement from the randomised list until the necessary sample size was reached. Students in both urban and rural study regions were chosen using the same process.

A total of 416 adolescents were recruited from four selected schools, with 208 participants selected from the urban area and 208 from the rural area. No participant was excluded from the final analysis because of incomplete study information, and all recruited participants were included in the final analysis. Verbal assent was gained for individuals under the age of 12 and written informed assent was acquired for adolescents aged 12

years and above. Before each subject was enrolled in the study, their parents or legally recognised representatives provided written informed consent.

A pretested, semi-structured questionnaire was used to interview participants in order to gather sociodemographic data and details related to mental health. Mental health assessment employed the Strengths and Difficulties Questionnaire (SDQ), a validated screening instrument developed to measure children and adolescent's abilities, emotional and behavioural and conduct difficulties.[10] The tool has demonstrated clinical utility in identifying mental health concerns in adolescents aged 11 and older.[11] The SDQ's psychometric properties-including validity and reliability are well established and comparable to other standardized behavioral assessment measures.[12]

The self-reported SDQ was administered in English. Instructions and questionnaire items were explained in Telugu when required to facilitate participant's understanding. The SDQ has established evidence of validity and reliability from previous studies.[10]

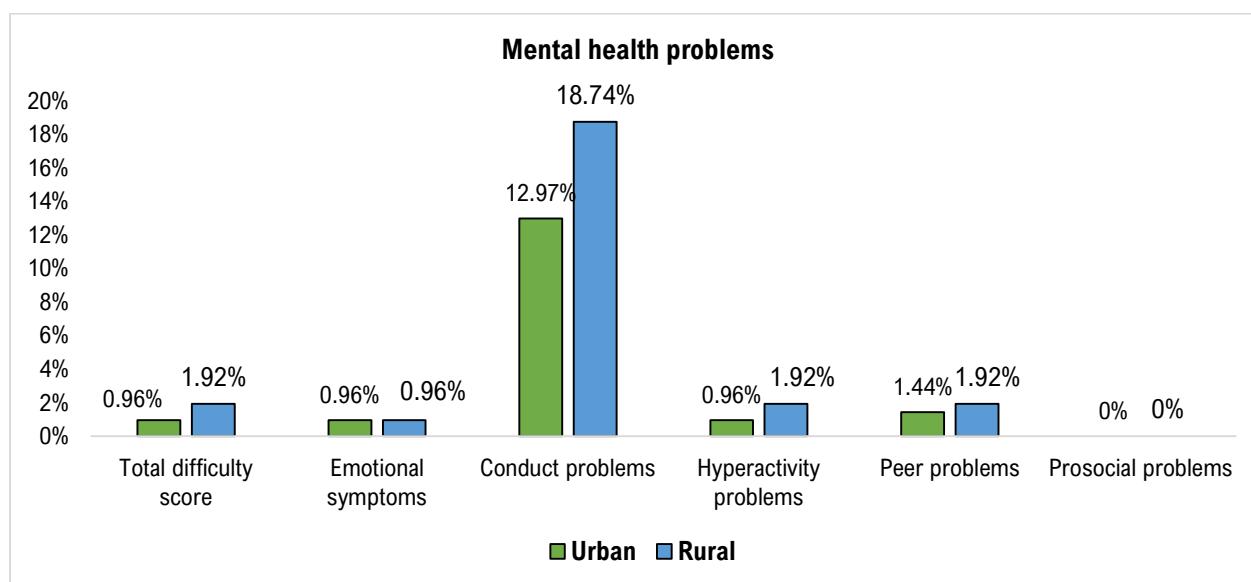
The SDQ comprises 25 items organized into 5 dimensions: emotional symptoms, conduct problems, peer relationship difficulties, hyperactivity-inattention and pro-social behavior. The study employed the self-report version, in which respondents rated their own experiences. The first four subscales were added to determine the total difficulty score, indicates overall severity of psycho-

logical symptoms, with higher scores reflecting greater mental health concerns.[13]

IBM SPSS (version 21) was used for data analysis. Frequencies and proportions were used to display descriptive data. Fisher's exact test and the Chi square test were used to analyse categorical data; the findings were presented as percentages. The Mann-Whitney U test was used to compare continuous variables. A p-value of less than 0.05 was considered statistically significant. The variables that were part of the final results analysis had no missing data.

## RESULTS

The majority in both areas belonged to the 10-15 years age group (urban 76.92%, rural 79.32%). Regarding fathers' education, the highest proportion in urban areas had completed intermediate/diploma (22.11%), while in rural areas the majority had studied up to high school (24.51%). For mothers' education, middle school was most common in urban areas (22.59%), whereas in rural areas primary school and middle school were equally predominant (24.51% each). In terms of family type, nuclear families made up the majority in both rural (71.63%) and urban (76.44%) regions. According to the Modified B.G. Prasad classification, most families in the urban region were in Class V (31.73%), whereas most families in rural regions were in Class IV (43.75%).



**Figure 1: Mental health problems' distribution and patterns among study participants in urban and rural regions (N=416)**

Figure 1 describes the distribution of borderline and abnormal mental health problems combined among rural and urban study participants. Conduct problems were the most commonly observed, affecting 12.97% of urban and 18.74% of rural participants. Other difficulties, including emotional symptoms, hyperactivity and peer problems were observed in smaller proportion, with

slightly higher prevalence among rural participants. With respect to prosocial behaviour, none of the participants fell within the borderline or abnormal range in either urban or rural areas. Overall, borderline and abnormal mental health problems were more commonly observed among rural participants than urban participants, with conduct problems being the major contributor.

**Table 1: Association between Socio demographic details with residence of the participants using chi square/ Fisher's exact test (N=416)**

| Characteristics                                                                  | Urban (N=208) (%) | Rural (N=208) (%) | X <sup>2</sup>    | P value |
|----------------------------------------------------------------------------------|-------------------|-------------------|-------------------|---------|
| <b>Age (Years)</b>                                                               |                   |                   |                   |         |
| 10-15                                                                            | 160 (76.9)        | 165 (79.3)        | 0.35              | 0.55    |
| 16-19                                                                            | 48 (23.1)         | 43 (20.7)         |                   |         |
| <b>Religion</b>                                                                  |                   |                   |                   |         |
| Hindu                                                                            | 162 (77.9)        | 155 (74.5)        | 2.81              | 0.24    |
| Muslim                                                                           | 31 (14.9)         | 28 (13.5)         |                   |         |
| Christian                                                                        | 15 (7.2)          | 25 (12)           |                   |         |
| <b>Occupation of the Father</b>                                                  |                   |                   |                   |         |
| Professional                                                                     | 0 (0)             | 0 (0)             | 4.20 <sup>F</sup> | 0.53    |
| Semi professional                                                                | 9 (4.3)           | 10 (4.8)          |                   |         |
| Clerical, shop owner, farmer                                                     | 31 (14.9)         | 24 (11.5)         |                   |         |
| Skilled worker                                                                   | 67 (32.2)         | 80 (38.5)         |                   |         |
| Semi-skilled worker                                                              | 65 (31.3)         | 67 (32.2)         |                   |         |
| Unskilled worker                                                                 | 35 (16.8)         | 25 (12)           |                   |         |
| Unemployed                                                                       | 1 (0.5)           | 2 (1)             |                   |         |
| <b>Occupation of the mother</b>                                                  |                   |                   |                   |         |
| Professional                                                                     | 0 (0)             | 0 (0)             | 11.5 <sup>F</sup> | 0.04*   |
| Semi professional                                                                | 3 (1.4)           | 10 (4.8)          |                   |         |
| Clerical, shop owner, farmer                                                     | 6 (2.9)           | 2 (1)             |                   |         |
| Skilled worker                                                                   | 14 (6.7)          | 22 (10.6)         |                   |         |
| Semi-skilled worker                                                              | 40 (19.2)         | 50 (24)           |                   |         |
| Unskilled worker                                                                 | 88 (42.3)         | 84 (40.4)         |                   |         |
| Unemployed                                                                       | 57 (27.4)         | 40 (19.2)         |                   |         |
| <b>Socio Economic Status of the family (Modified B.G. Prasad classification)</b> |                   |                   |                   |         |
| Class I                                                                          | 0 (0)             | 0 (0)             | 7.70 <sup>F</sup> | 0.052   |
| Class II                                                                         | 12 (5.8)          | 9 (4.3)           |                   |         |
| Class III                                                                        | 66 (31.7)         | 51 (24.5)         |                   |         |
| Class IV                                                                         | 64 (30.8)         | 91 (43.8)         |                   |         |
| Class V                                                                          | 66 (31.7)         | 57 (27.4)         |                   |         |

<sup>F</sup> - Fisher's exact test**Table 2: Association of mental health problems with area of residence (N=416)**

| Characteristics               | Urban (N=208) (%) | Rural (N=208) (%) | X <sup>2</sup>    | p-value           |
|-------------------------------|-------------------|-------------------|-------------------|-------------------|
| <b>Total difficulty score</b> |                   |                   |                   |                   |
| Normal                        | 206 (99)          | 204 (98.1)        | 1.18 <sup>F</sup> | 0.81 <sup>F</sup> |
| Borderline                    | 1 (0.5)           | 1 (0.5)           |                   |                   |
| Abnormal                      | 1 (0.5)           | 3 (1.4)           |                   |                   |
| <b>Emotional problems</b>     |                   |                   |                   |                   |
| Normal                        | 202 (97.1)        | 206 (99)          | 2.77 <sup>F</sup> | 0.22 <sup>F</sup> |
| Borderline                    | 5 (2.4)           | 1 (0.5)           |                   |                   |
| Abnormal                      | 1 (0.5)           | 1 (0.5)           |                   |                   |
| <b>Conduct problems</b>       |                   |                   |                   |                   |
| Normal                        | 181 (87)          | 169 (81.3)        | 2.85              | 0.24              |
| Borderline                    | 20 (9.6)          | 31 (14.9)         |                   |                   |
| Abnormal                      | 7 (3.4)           | 8 (3.8)           |                   |                   |
| <b>Hyperactivity problems</b> |                   |                   |                   |                   |
| Normal                        | 204 (98.1)        | 204 (98.1)        | 0.32 <sup>F</sup> | 0.999             |
| Borderline                    | 3 (1.4)           | 3 (1.4)           |                   |                   |
| Abnormal                      | 1 (0.5)           | 1 (0.5)           |                   |                   |
| <b>Peer problems</b>          |                   |                   |                   |                   |
| Normal                        | 205 (98.6)        | 204 (98.1)        | 0.53 <sup>F</sup> | 0.999             |
| Borderline                    | 2 (1)             | 2 (1)             |                   |                   |
| Abnormal                      | 1 (0.5)           | 2 (1)             |                   |                   |

<sup>F</sup> - Fisher's exact test.

**Table 3: Comparison of the study group's mean rank on all SDQ scales according to residency (Mann-Whitney U test) (N=416)**

| Domains                   | Mean rank |        | p-value |
|---------------------------|-----------|--------|---------|
|                           | Urban     | Rural  |         |
| Emotional Problems Scale  | 224.00    | 193.00 | 0.001*  |
| Conduct Problem Scale     | 198.75    | 218.25 | 0.02*   |
| Hyperactivity Scale       | 195.72    | 221.28 | 0.001*  |
| Peer Problem Scale        | 208.00    | 209.00 | 0.70    |
| Total Difficulties Score  | 205.70    | 211.30 | 0.57    |
| Prosocial Behaviour Score | 205.65    | 211.35 | 0.23    |

Table 2 shows that most frequent issues were conduct-problem, with borderline condition reported in 9.6% of urban and 14.9% of rural participants, and abnormal problems in 3.4% and 3.8% respectively. Other mental health problems were observed in relatively smaller proportions. However, none of the mental health problem domains showed a statistically significant association with area of residence.

The Mann-Whitney U test revealed that, compared to urban adolescents, rural adolescents had significantly greater mean ranks for emotional symptom, conduct issues, and hyperactivity-inattention.

## DISCUSSION

SDQ questionnaire created for adolescents was used in this investigation. The five subscales help to assess the different dimensions of difficulties experienced by adolescents.[14]

While the overall burden of abnormal mental health problems on the SDQ was low in both settings, this comparative study revealed that rural adolescents consistently displayed a higher prevalence of difficulties and significantly higher mean problem scores than their urban counterparts, especially for conduct, hyperactivity, and emotional problems. Adolescents in urban and rural settings did not significantly differ in their overall problems score ( $p=0.57$ ).

Sociodemographic profile of rural adolescents, which includes lower parental and maternal education levels, greater representation in lower socioeconomic strata, and potentially different parental supervision, academic pressure, or access to recreational and mental health resources, may be connected to the higher burden of conduct, emotional, and hyperactivity difficulties among adolescents.

In the present study, an abnormal total difficulties score was found among 0.48% of participants in urban regions and 1.44% in rural regions. When borderline and abnormal categories were combined, Conduct problems were the most commonly observed difficulty, affecting 12.97% in urban areas and 18.74% in rural areas, when only abnormal category was considered, conduct problems were observed in 3.36% of urban and 3.84% of rural adolescents, followed by peer problems (0.48% in urban areas and 0.96% in rural areas), emotional problems

(0.48% in both areas), hyperactivity problems (0.48% in both areas), and prosocial problems (0% in both areas). Emerging behavioural and emotional issues may be more common and severe by the time of assessment because they are less likely to be noticed or treated at an early stage due to inadequate knowledge, stigmatisation, and a shortage of counselling services in rural regions.

These results were consistent with a study by Shek-hawat R et al.[15], which discovered that behavioural issues were the most frequently reported difficulty, followed by emotional, prosocial, and peer concerns. In contrast to this study, a study by Chhetri UD et al.[16] discovered that peer problems were the most commonly reported mental health concern among school children, followed by conduct and emotional issues. According to Reddy BK et al.[17], a large number of adolescents suffer from mental health issues. According to their research, 15.3% of adolescents had borderline, and 8.7% of them had abnormal scores.

Adolescent mental health disorder was shown to be independently associated with personal characteristics such as learning challenges, an absence of security, unusual habits, and prior experiences of "physical / verbal abuse," according to a Goa study[18]. Numerous research has also demonstrated the association between adolescents' mental health disorder and characteristics such family type, reading challenges at home, school type, self-harm behaviours, visual issues, parental education, and financial struggles.[18-23]

Although the categorical analysis based on normal, borderline and abnormal SDQ classifications did not demonstrate a statistically significant association between area of residence and any SDQ domain, the Mann-Whitney U analysis of the underlying continuous SDQ scores showed significantly higher mean ranks among rural adolescents for emotional symptoms, conduct problems and hyperactivity-inattention. This difference may be explained by variations in the severity and distribution of symptoms within the SDQ categories. Adolescents in the rural group may have had higher symptom scores within the same categorical classification without a sufficient difference in the proportion crossing the predefined category thresholds. Thus, the two analyses provide complementary findings: the categorical analysis describes differences in the proportion of adolescents falling into clinically defined categories, whereas the continuous-score analysis identifies differences in the overall severity and distribution of symptoms between the groups.

The current study found significant variations when comparing the emotional symptoms scale, hyperactivity scale, and conduct problem scale by residence. Reddy BK et al.[17] discovered that the emotional symptoms scale differential was more pronounced in female adolescents than in male adolescents. Therefore, across different groups, emotional symptoms scale may be more frequently used to predict the likelihood of mental health illness.

Adolescents, their families, educators and healthcare facilities should all be involved in the multifaceted planning of interventions for adolescent mental health. For timely and appropriate management, frequent mental health screenings and specialised care should be offered in addition to the standard “adolescent health services” offered at the primary healthcare level.[24]

## LIMITATIONS

Due to the study's reliance on self-reported data, social desirability and recall bias may have been introduced. Because a temporal relationship between the exposure and outcome variables cannot be demonstrated due to the cross-sectional study design, causal conclusions cannot be drawn. Since the study result was restricted to a single district, results may not be generalizable to adolescents in different locations. Changes in seasonal, societal, or environmental conditions throughout the study period may have caused temporal fluctuations in the measured outcomes during the data collection period.

## CONCLUSION AND RECOMMENDATIONS

Both urban and rural school-age adolescents were found to have mental health issues, with a slightly high proportion of abnormal difficulty scores among rural adolescents. Adolescents from urban and rural areas differed significantly in emotional, behaviour, hyperactivity problems, with conduct problem being the most commonly mentioned challenge. These results emphasise the significance of early mental health issue diagnosis and school-based mental wellness screening and support programs may be warranted. Future qualitative and longitudinal research may be helpful to identify the root causes of mental health problems, particularly in rural adolescents.

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**Availability of data:** The data that support the findings of this study are available from the corresponding author on reasonable request.

**Declaration of Non-use of generative AI Tools:** This article was prepared without the use of generative AI tools for content creation, analysis, or data generation. All findings and interpretations are based solely on the authors' independent work and expertise.

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