ORIGINAL ARTICLE
Burden of anxiety in Adolescent: A community-based study in Western Uttar Pradesh

Sudhir Kumar Gupta[1], Anish Prabhakar[2], Amit Kumar[3], Nawaid Arif[4], Sachin Singh Yadav[5], Shilpa Reddy Ganta[6]

[1,2,3,6]Department of Community Medicine, Teerthankar Mahaveer Medical College and Research Centre, Bagadpur, Uttar Pradesh

[4]Department of Community Medicine, Amaltas institute of Medical Sciences, Dewas, Bangar, Madhya Pradesh

[5]Department of Community Medicine, Government Medical College, Datia, Madhya Pradesh

ABSTRACT

Background: Anxiety is a prevalent issue among adolescents and can adversely affect their academic performance and everyday functioning. **Aims & Objectives**: To estimate the prevalence of anxiety among adolescents in urban and rural areas and to study the socio-demographic correlates of anxiety among adolescents in urban and rural areas. **Methods**: A comprehensive survey was conducted in the field practice area of Department of Community Medicine of a Medical College in western district of Uttar Pradesh. The survey was aimed at young people between the ages of 10 and 19 who lived in the practice area of the medical college. **Result**: The burden of anxiety was observed to be 19.6 % (n=92). Female gender, urban residence, early adolescent age-group (10-13 yr), nuclear family, day-time somnolence and family history of mental illness were factors having statistical significance. Poor education level of parents was also statistically significant. Physical activity and substance abuse did not have significant contribution in burden of anxiety. **Conclusion**: Anxiety in adolescents is a significant issue influenced by various factors. Early intervention and support are crucial.

INTRODUCTION

Anxiety disorders are common and usually manifest early in people, making them one of the most common mental illnesses. (1) Most mental disorders that appear in adulthood actually appear before the age of 14, but a significant proportion of these cases go unnoticed or undiagnosed.(2)

Research has shown that anxiety symptoms are widely found among children and adolescents worldwide. A comprehensive

analysis of 41 studies across 27 countries, involving children aged 4 to 18 years, revealed that the global prevalence rates was 13.4 percent for any mental disorder, 65 percent for anxiety, and 26 percent for depression. However, the prevalence of anxiety among young individuals differs significantly across countries, ranging from 18.1 percent in India to 39.4 percent in Mexico.(3) Anxiety can appear early, with median age of onset being as early as six years.(4)

Anxiety has far-reaching effects on individuals, affecting how they function in life. Anxious pupils face more bullying, quit school with fewer qualifications with often having a limited social life. In workplace, there is more absenteeism and poorer job performance.(5)
The objectives of our research:
1. Estimate the prevalence of anxiety among adolescents in urban and rural areas
2. Study the socio-demographic factors of anxiety among adolescents in urban and rural areas.

MATERIAL & METHODS

A comprehensive survey was conducted in the field practice area of the Department of Community Medicine of Medical College and Research Centre in western districts of Uttar Pradesh. The survey was aimed at young people between the ages of 10 and 19 who lived in the practice area of the college.
Sample size was calculated using the formula $z2pq/d2$ with the assumption of prevalence (p) to be 3.6% based on the prevalence of anxiety disorders among adolescents as reported by the National Mental Health Survey (2015-16).(6) The absolute error in precision (d) was taken to be 1.8%, which was 50% relative to p. The value of z was taken as 1.96 for 95% confidence level, and q was calculated by the equation q = 100-p. The calculated sample size was 411. Assuming higher level of non-responses, because the study was done in the community where participants were approached at their houses, the sample size was corrected for 20% non-responses, giving a figure of 513 participants. This figure was divided into 206 participants from urban area and 207 from rural areas.

Inclusion Criteria
The inclusion criteria of the study were as follows:
1. Adolescents in attendance at the time of the data collection
2. Adolescents who provide written assent/consent, as applicable.

Exclusion Criteria
The following criteria of the study exclusion:
1. Adolescents who weren't available when the study was being conducted
2. Adolescents who are not willing to provide written assent/consent.
3. Adolescent who were non-resident (Living for <6months) of the field practice area

Sampling Method
In our investigation, a multistage sampling method with a random technique was implemented.
First stage: Selection of primary sampling units (PSUs)
The PSU includes all villages and mohallas in the field practice area. As per records we had 29 villages in rural PSU and 23 mohallas in urban PSU. Our department conducts an annual census to determine the population of all PSUs. Paper chits were prepared of all villages and mohallas of rural and urban areas separately. The required number of villages and mohallas, i.e. 10 each, was selected using simple random sampling through lottery.

Second stage: Selection of families
From each PSU 25 subjects were to be selected. All families of mohallas and village in the field training area are regularly listed by the department. Families with adolescent were selected and given a serial number. Random numbers generated online were then assigned to each of the selected households. The desired sample size from each PSU was then fulfilled by selecting these random numbers at random intervals. The adolescent in the selected household was administered a structured pre-designed questionnaire after obtaining informed assent/consent. Data collection was done within the premises of the household. In the event that more than one such juvenile was spotted, one of them was chosen at random. When an investigator visited a predetermined family, he would move

on to the next if no adolescent was present in their household. The process was followed until the achievement of required sample size.
Ethical Considerations: University's Institutional Review Board and Ethical Committee reviewed and approved the study vide letter no: TMMC/IEC/2017/40.
**Scales:** The socio-demographic parameters of adolescents, including their age, religion, education, type of household and other parameters including socioeconomic status through Modified B.G. Prasad scale (2018) (7), were evaluated using a predesigned questionnaire. Adolescent stress was measured using the DASS-21 Scale.(8) Reliable and valid Hindi version of the scale available from University of New South Wales website was utilized in the study.(9,10)
Data Management and Analysis: Daily updates to a Microsoft Excel Word Spreadsheet were performed with the collected data. Tables with the data were prepared. Applying Epi Info statistical software package Version 7.1.5, data was evaluated. Chi-square test was used as a measure of significance. Statistical significance for the difference was set at $P < 0.05$.

RESULTS

In our study 500 participants (250 each from urban and rural area) were evaluated (13 non response; 6 from urban area and 7 from rural area), out of which the male participants from rural areas and urban areas were 149 and 141 respectively, while 101 of the female participants lived in rural areas and 109 in urban areas. The distribution of adolescents by age group is shown in Figure 1.

Figure 1: Residence and Age Wise Distribution of Study Population
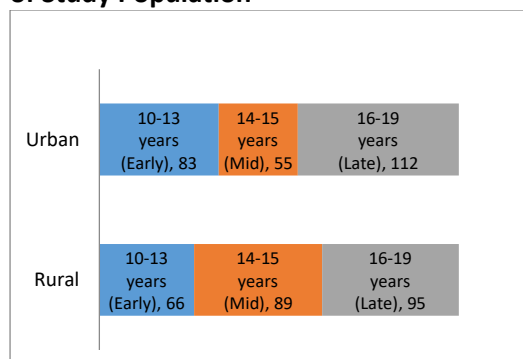
Majority of adolescents (207) belonged to the late adolescent (16–19 years) age group, followed by the early (149) and middle adolescent (144) age groups. In the late age group, more adolescent came from urban areas (112) than from rural areas (95). The grading of anxiety amongst the participants is given in Table 1. The burden of anxiety in our study was 18.4% (n=92).

TABLE 1: Distribution of participants as per DASS 21 scale

Score (Grade)	Male	Female	Total
0 - 7 (Normal)	263	146	409
8 - 9 (Mild)	28	44	72
10 - 14 (Moderate)	2	6	8
15 - 19 (Severe)	1	10	11
20+ (Extremely Severe)	0	1	1

Nearly two-thirds of adolescent in urban areas belonged to nuclear families, while 38% of respondents belonged to joint families. Rural respondents were more likely to live in joint families than urban respondents (53% and 47% respectively). More participants in our survey (280) practiced Islam, with the remaining followed Hinduism (220). Playing games was described by most participants (63%) as their favourite pastime, followed by walking (19.2%) and running (8.1%). Among adolescent, participation in the gym was only 2.3 percent. 52.7% of adolescent engage in regular religious activities, while the remaining (47.3%) responded negatively. A total of 71 adolescent acknowledged substance abuse; tobacco use (in any form) was maximum (83.1%), followed by alcohol at 26.8 percent. Few of the participants (n=3) reported having multiple addictions. Affliction with any chronic illness was present in 16 percent of adolescents. One-third (33.25%) of the study population had a family history of mental illness.

Table 2 shows the variables that exhibit strong statistical significance, including gender, place of residence, stages of adolescence, family type, daytime sleep patterns, and family history of mental illness. The highest number of adolescent belonged to lower class (n=113; 22.6%) followed by lower middle class (n=109; 21.8%), upper class (n=107; 21.4%), middle class (n=100; 20%) and upper middle class (n=71; 14.2%).

Table 2: Factors associated with Anxiety

Variable		Total	$x2$ value
Male (n=290)	Female (n=210)	Total (n=500)	
30 (10.3%)	62 (29.5%)	92 (18.4%)	$x2=$ 29.17*
Place Of Residence			
Rural (n=250)	Urban (n=250)	Total (n=500)	$x2=5.29*$
34 (13.6%)	58 (23.2%)	92 (18.4%)	
Stages of Adolescent			
10-13 Years (Early Adolescent) n=149	14-15 Years (Mid Adolescent) n=145	16-19 Years (late Adolescent) n=206	$x2=$ 11.42*
44 (29.5%)	20 (13.8%)	28 (13.6%)	
Religion			
Hindu (n= 220)	Muslim (n= 280)	Total (n=500)	$x2= 1.57$
34 (15.5%)	58 (20.7%)	92 (18.4%)	
Type of Family			
Nuclear Family (n= 273)	Joint Family (n= 227)	Total (n=500)	$x2= 7.09*$
64(23.5%)	28 (12.3 %)	92 (18.4%)	
Substance Abuse @			
Tobacco (n= 59)	Alcohol (n= 19)	Others (n= 11)	$x2= 0.75$
16 (27.1%)	8 (42.1%)	7 (63.6%)	
Duration of Sleep			
Sleep <6 h (n= 70)	Sleep 6-8 h (n= 323)	Sleep >8 h (n= 107)	$x2= 1.34$
17 (24.3%)	55 (17.02%)	20 (18.7%)	
Day Time Sleep			
Present (n= 161)	Absent (n= 339)	Total (n=500)	$x2=$ 12.16*
47(29.2%)	45 (13.3%)	92 (18.4%)	
Family History of Mental Illness			
Present (n= 166)	Absent (n= 334)	Total (n=500)	$x2=$ 13.52*
49(29.5%)	43 (12.9%)	92 (18.4%)	
Duration of Physical Activity			
Sufficient (n= 140)	Insufficient (n= 360)	Total (n=500)	
19 (13.6%)	73(20.3%)	92 (18.4)	$x2= 2.13$

p<0.05 @Multiple response

The educational qualification of the parent was found to be an important parameter in adolescent found to have anxiety disorder. (Table 3)

Table 3: Distribution of anxious Adolescent according to Education of Parents

Educational Qualification	Graduate & above	Higher Secondary	High School	Middle School	Primary School	Illiterate	$x2$ value
Mother	19 (20.3%) (n=93)	7 (23.3%) (n=30)	5 (5.2%) (n=96)	13 (35.1%) (n=37)	4 (4.9%) (n=82)	44 (27.2%) (n=162)	$x2=26.3*$
Father	25 (12.3%) (n=203)	9 (17.5%) (n=50)	6 (5%) (n=124)	5 (33.3%) (n=15)	3 (6.7%) (n=37)	44 (61.4%) (n=71)	$x2=64.0*$

p<0.05

DISCUSSION

In this study, 290 respondents (58%) were male and 210 (42%) were female. Among the male participants, 149 (51%) resided in rural areas, while 141 (49%) lived in urban areas. However, this was reverse for the female participants; 101 (48.2%) lived in rural areas, and 109 (52.8%) lived in urban areas.

Comparatively, a study conducted by Sandal RK et al. (2017) in Chandigarh, with a sample size of 470 adolescents, reported that 54.68 percent were male, and 45.32 percent were female.[11] Another study by Karande S et al. in Mumbai had 40.6 percent male and 59.4 percent female participants.[12] Study from rural area of Muzaffarnagar, Uttar Pradesh, done by Jain V. et al. involving 210 adolescents,

had only 37.6 percent male participants, while the remaining 62.4 percent were female.(13)

Our research revealed that anxiety affected 23.2 percent of adolescents in urban areas and 13.6 percent in rural areas. We observed a significant statistical difference in anxiety rates between these two populations. Previous study conducted by Satyanarayana et al. (2017) has also found that the urban population experienced significantly higher levels of both depression and anxiety compared to their rural counterparts.(14)

In our study, 207 adolescents (41.4%) were classified as being in the late adolescent stage, while 149 adolescents (29.8%) were classified as being in the early adolescent stage. Similarly, study conducted by Jain V. et al. (2014) reported that 39 percent of their respondents belonged to the late adolescent stage, while 27.6 percent were in early adolescence.(13) The findings of our study indicated that early adolescents had a higher prevalence of anxiety. The results presented by Mishra SK et al. (2018) found higher rates of anxiety in the mid-adolescent stage.(15) Vaibhav Jain et al. reported that anxiety was highest in late-adolescent boys and girls.(13)

The findings of our study reveal that the majority of adolescents (54.6%) were living in nuclear families, while the remaining (45.4%) belonged to joint families. Study of Mishra SK et al., also reported more adolescents (62%) were residing in nuclear families and less lived in joint families (38%).(15) In our study, prevalence of anxiety was more seen in adolescents living in nuclear families as compared to joint families. Similar results were found by Revina Ann Mary et al. (2014) which reported that higher anxiety was measured in nuclear families as compared to joint families and this difference was statistically significant.(16)

In our study, the burden of anxiety amongst those admitting substance abuse, the maximum prevalence of anxiety (40%) was found in adolescents consuming alcohol. However association between type of substance used by adolescents and prevalence of anxiety was not found to be statistically significant. In a study conducted by Yadav P et al. (2017) presence of smoking and alcohol use

in the students shows a significant increase in the frequency of anxiety.(17)

In our study it was observed that daytime sleepiness was seen in nearly one third of participants who were reported to have anxiety disorder as compared to only 13.3 percent of disease in people who are alert during daytime. We have found this finding statistically significant. Study done by Hein M et al. (2020) have observed that day time sleepiness as an important problem in adolescent with anxiety and depressive disorders.(18) Ballinger, Lisa R has reported significant positive correlations between sleepiness and anxiety.(19)

We have observed that positive family history of mental illness was seen in 29.5 percent of respondents with anxiety disorder while only 12.9 percent of respondent reported anxiety disorder in absence of family history of mental illness. This distribution was found to be statistically significant. McLaughlin, K. A et al. (2008) in their intervention trial noted that individuals with generalized anxiety disorder were more likely to have family members with anxiety problems, but not other psychological problems.(20)

In our study, prevalence of anxiety was found to be more in adolescents who had education level of primary schools pass followed by studying in high school and illiterate. Mishra SK et al. found in his study that anxiety was more in students of lower classes.(15)

Maximum adolescent of illiterate father were suffering from anxiety and father's education was statistically significant. Maximum adolescents of mothers educated till high school were suffering from Anxiety. Also association of anxiety and mother's education was found to be statistically significant. According to the study conducted by Watode BK et al., most adolescent had fathers who were postgraduates (46.2 %), followed by graduates (40.5%), and below-graduate fathers (13.3%). In terms of mothers, the majority (42.6%) had an educational level below graduation, followed by graduates (32.7%), and holders of higher degrees (24.6%).(21) In our study, the majority of fathers (40.6%) were graduates, followed by those who had completed high school (24.8%),

and 14.2 percent were illiterate. Regarding mothers, the highest percentage (32.4%) were illiterate, followed by 19.2 percent who had completed high school, and only 18.6 percent were graduates or had higher educational qualifications.

In our study, anxiety was found to be more in adolescents belonging to lower middle socioeconomic class (24.1%). The association between socioeconomic status of adolescents and prevalence anxiety was statistically significant. Sibnath D et al. in his study concluded that adolescents belonging to the middle class (middle socio-economic group) suffered more anxiety than those from both high and low socio-economic groups.(22) Singh MM et al. also found that adolescents belonging to middle socio economic condition had shown a higher prevalence of anxiety.(23)

In our study, the prevalence rate of anxiety was 18.4 percent. This finding contributes to the broader discussion on the topic of anxiety in the existing literature. Notably, other studies have reported varying prevalence rates of anxiety. For instance, Singh MM et al. found a higher rate of 86.5 percent for anxiety, indicating a substantial presence of anxiety symptoms among the studied population.(23) Similarly study by Sandal RK et al.found a higher prevalence rate of anxiety at 80.85 percent.(11) Conversely, Kumar S. et al. reported a lower rate of 24.4 percent for anxiety, suggesting a comparatively lower prevalence of anxiety among their sample.(24) Mishra SK et al. reported a rate of 15 percent for anxiety, which aligns with our findings.(15) These variations in prevalence rates highlight the complex nature of anxiety and the importance of considering multiple studies to gain a comprehensive understanding of its prevalence.

CONCLUSION

Anxiety in adolescents is a significant issue influenced by various factors. Factors identified as statistically significant include gender, place of residence, stage of adolescence, type of family and family history of mental illness are non-modifiable but these provide insight as to where early intervention and support can be crucial for reducing morbidity. Treatment options include therapy and medication. Building a supportive environment, promoting resilience, and open communication are essential to aid the adolescents to seek intervention against anxiety and improve their mental well-being.

LIMITATION

Limitations of studying anxiety in adolescents include reliance on self-report measures, cross-sectional designs, potential memory/recall biases, limited cultural considerations impacting the generalizability and comprehensive understanding of the subject.

RECOMMENDATION

Based on the study's limitations, recommendations incorporating multiple assessment methods, employing longitudinal designs, considering cultural factors, examining co-morbidities, and exploring interventions such as school-based mental health programs to enhance understanding and support for anxiety in adolescents.

AUTHORS CONTRIBUTION

All authors have contributed equally.

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Nil

CONFLICT OF INTEREST

There are no conflicts of interest.

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