RESEARCH PAPER

A cross-sectional study to estimate the prevalence of Stress, Anxiety and Depression among Adolescents in Chengalpet District

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ABSTRACT

Introduction Teenagers are especially susceptible to mental health problems like stress, anxiety, and depression, which can have a big influence on their general development and well-being. The purpose of this study was to determine the prevalence of these disorders among adolescents in Chengalpattu district and investigate the related lifestyle, scholastic, familial, and socio-demographic factors.

Methods A community-based cross-sectional survey was conducted from four villages in the Thiruporur block of the Chengalpattu district and 275 adolescents between the ages of 10 and 19 participated. Multiple-stage random sampling was used to choose the participants. The Depression, Anxiety, and Stress Scale-21 (DASS-21), which was translated into the local language and a pre-tested semi-structured questionnaire were used to gather data. With a significance level of $p<0.05$, chi-square tests and descriptive statistics were used in the statistical analyses.

Results Participants had moderate levels of stress, anxiety, and depression (45.1%, 37.8%, and 35.6%, respectively). The prevalence was disproportionately higher among females (84.5% depression, 88.8% anxiety, and 88.2% stress) and early teens (97.1% depression, 98.6% anxiety, and stress). The prevalence of mental health issues was higher among adolescents from lower socioeconomic groups and those enrolled in government schools. Higher rates of stress and depression were linked to family dynamics, such as nuclear family structures and less interaction between parents and adolescents. While physical inactivity exhibited minor connections, stress (100%) and anxiety (94.4%) were significantly influenced by poor sleep patterns (less than 6 hours per night). Higher levels of stress and anxiety showed a slight correlation with academic unhappiness, but there was no significant relationship between study hours and screen time.

Conclusion The study concludes that socio demographic, familial, and lifestyle factors are important in the high prevalence of mental health problems among teenagers in Chengalpattu area. To address these issues, family support, lifestyle changes, and comprehensive school- and community-based interventions are crucial.

Keywords Adolescent, Anxiety, Depression, Stress

How to cite this article: Raja TK, Kumudha G, Iswariya K, Prasanth K, Janaarthanan H. A Cross-Sectional Study to Estimate the Prevalence of Stress, Anxiety and Depression Among Adolescents in Chengalpet District. Int J Drug Deliv Technol. 2026;16(22s): 104-114. DOI: 10.25258/ijddt.16.22s.11

INTRODUCTION

Adolescence, defined as the period between 10 and 19 years, is a critical stage of growth and development marking the transition from childhood to adulthood. According to UNICEF, adolescents constitute about 1.3 billion individuals, representing 16% of the global population. Supporting adolescents in all aspects of their well-being, especially mental health, is essential for building a healthy and productive adulthood. Mental health disorders are a leading cause of disease burden among adolescents worldwide, with one in seven affected, accounting for approximately 166 million individuals—89 million boys and 77 million girls.[1]

Globally, mental illnesses such as anxiety and depression remain among the top contributors to health burden. The Global Burden of Diseases (GBD) 2019 study ranked these disorders among the top 25 causes of disability, with little reduction in prevalence since 1990 despite available interventions.[2] The COVID-19 pandemic has further worsened mental health, causing

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fear, helplessness, and isolation across all levels of society, emphasizing the importance of early identification and intervention for psychiatric conditions.[3]

Depression, a common psychiatric disorder affecting emotions, cognition, and behaviour, is a major global public health challenge.[4,5] Evidence shows that many adult mental health problems originate during adolescence, highlighting the importance of early prevention and intervention. Adolescents in low- and middle-income countries (LMICs) are especially vulnerable due to exposure to conflict, disasters, and social inequalities.[5] Chronic stress can lead to anxiety, panic disorders, and depression, often forming a vicious cycle of psychological distress that affects immunity, sleep, and social functioning.[5]

According to WHO, the global prevalence of depression among adults is 5% and anxiety 4%.[6] Depression contributes significantly to functional impairment and reduced quality of life, affecting over 280 million people worldwide. Neglect of child and adolescent mental health in LMICs has major developmental and economic consequences.[6] Indian studies also show worrying trends—Sibnath et al. reported that 37.7% of students had moderate depression, 13.1% severe, and 2.4% extremely severe depression.[7]

Several factors contribute to depression and anxiety among adolescents, including loneliness, substance abuse, lack of parental support, academic stress, and family conflict.[8–10] Parenting styles, particularly harsh or authoritarian behaviour, have also been linked to depressive symptoms.[11] Moreover, the excessive use of digital technology and social media has emerged as a modern contributor to adolescent stress and depression.[11] Early detection and intervention are crucial to mitigate long-term consequences and improve outcomes.[12]

Adolescence in India is marked by rapid socio-cultural and academic transitions that can increase vulnerability to stress, anxiety, and depression. Despite their importance, studies focusing on adolescent mental health in India—particularly in semi-urban and rural regions—remain limited. Chengalpet District, with its diverse adolescent population, lacks region-specific data on these mental health issues. Understanding their prevalence and associated risk factors is vital for designing targeted interventions, preventive strategies, and public health policies that promote adolescent well-being.

Hence, this study aims to estimate the prevalence of stress, anxiety, and depression among adolescents in Chengalpet District and to identify factors associated with these conditions. The findings are expected to contribute valuable evidence for improving adolescent mental health programs and guiding future interventions to enhance their overall quality of life.

AIM AND OBJECTIVES OF THE STUDY

The study aims to estimate the prevalence of stress, anxiety, and depression among adolescents in Chengalpet District and to identify the factors associated with their development. Specifically, the study seeks to determine the proportion of adolescents experiencing stress, anxiety, and depression, while also exploring the various socio-demographic, environmental, and behavioural factors contributing to these mental health conditions.

METHODOLOGY

The present study was a community-based descriptive cross-sectional study conducted to estimate the prevalence of stress, anxiety, and depression among adolescents in Chengalpet District, Tamil Nadu. According to the 2011 Census, Chengalpet District has a population of 1,77,222 and is served by Community Health Centres, Primary Health Centres, sub-centres, medical colleges, and private healthcare facilities. The study was carried out in the Thiruporur block, covering four randomly selected villages—Sembakkam, Vembedu, Illalur, and Thaiyur. The total duration of the study was 18 months, from July 2023 to December 2024. The study population comprised adolescents aged 10–19 years residing in the selected villages. Adolescents who provided assent (for those aged ≤12 years) or consent (for those >12 years) along with parental consent were included, while those unwilling to participate or unavailable after three home visits were excluded.

The sample size was estimated based on a previous study by Sandal RK et al. (13) (2014), which reported an anxiety prevalence of 80.85% and the sample size was 275. Multistage random sampling was adopted. From the eight blocks in Chengalpet District, Thiruporur block was chosen using simple random sampling. Four villages—Sembakkam, Vembedu, Illalur, and Thaiyur—were then selected by the lottery method. Following line listing of households with adolescents, participants were selected using systematic random sampling with computer-generated random numbers, ensuring inclusion and exclusion criteria were satisfied. If a selected adolescent was unavailable even after three visits, the next eligible adolescent from a neighbouring household was included.

Data collection commenced after obtaining approval from the Institutional Human Ethics Committee (IEC No: 2023/846). The principal investigator used a pre-tested and validated semi-structured questionnaire and the DASS-21 (Depression, Anxiety, and Stress Scale-21) tool. Both instruments were translated into Tamil and linguistically validated prior to use. Interviews were conducted face-to-face in the local language after obtaining informed assent and consent. Confidentiality and privacy were strictly maintained. Data were entered in Microsoft Excel and analyzed using SPSS software version 17. Descriptive statistics were expressed as frequencies and percentages. Associations between categorical variables were assessed using the Chi-square test and Fisher's Exact test, and a *p*-value of less than 0.05 was considered statistically significant.

RESULTS

The study included 275 adolescents, the majority (70%) belonging to the middle adolescent age group (14–16

years), followed by early adolescents (25%). Most participants were female (68%). The majority of students (41%) were in the 12th grade. The vast majority were Hindus (93%), with nuclear households accounting for 67%. The majority of families (70%) had two children. According to the amended socio-economic classification, 37% of participants were in Class II, with 30% in Class III. (Table 1)

Table 1: Distribution of study participants according to sociodemographic characteristics (n = 275)

S.no	Sociodemographic details	Frequency (n=275)	Percentage (%)
1	Age category		
	Early adolescent (10-13 years)	69	25
	Late Adolescent (17-19 years)	13	5
	Middle adolescent (14-16 years)	193	70
2	Gender		
	Male	88	32
	Female	187	68
3	Standard		
	VII	2	1
	VIII	30	11
	IX	74	27
	X	31	11
	XI	26	9
	XII	112	41
4	Religion		
	Hindu	257	93
	Christian	15	5
	Muslim	3	2
5	Type of family		
	Nuclear	185	67
	Joint	21	8
	Third Generation	58	21
	Separated	11	4
6	Number of Children		
	1	22	8
	2	193	70
	3	45	16
	4	13	5
	5	2	1
7	Socio-Economic classification		
	I	30	11
	II	103	37
	III	83	30
	IV	58	21
	V	1	1

Most adolescents had a normal BMI (52.7%) and followed a mixed diet (87.6%). Physical activity was reported by 67.3%, while smoking (1.8%) and alcohol use (0%) were rare. Academically, 91% wished to continue school and 53% were satisfied with their performance. About 75% had trouble concentrating, and 39% reported altered appetite. Most slept 6–8 hours (53%) and went for outings once a month (45%). Family interaction was common (85%), with 7% reporting mental health issues in the family and 42% having a family history of smoking or alcohol use. (Table 2)

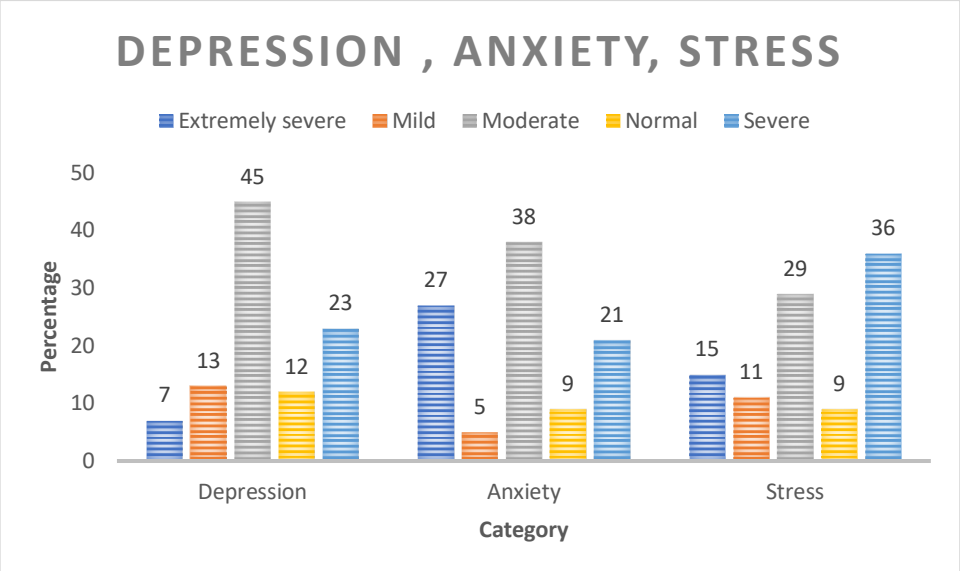
Table 2: Distribution of Participants by Lifestyle, Academic, Personal, and Family Factors (n = 275)

Lifestyle Factors		**Frequency (N=275)**	**Percentage (%)**
Body Mass Index	Normal	145	52.7
	Obese	23	8.4
	Overweight	30	10.9
	Underweight	77	28
Dietary pattern	Vegetarian	22	8
	Non-Vegetarian	12	4.4
	Mixed	241	87.6
Physical activity	Yes	185	67.3
	No	90	32.7
Smoke	Yes	5	1.8
	No	270	98.2
Alcohol	Yes	0	0
	No	275	100
Academic Variables			
Willing to continue school	Yes	250	91
	No	25	9
Regret going to school	Yes	41	15
	No	234	85
Satisfied with academic performance	Yes	146	53
	No	129	47
Hours of study per day	<2 hours	121	44
	2-4 hours	137	50
	>5 hours	17	6
Hours spent on mobile phone/TV/Games	<3 hours	151	55
	3-5 hours	108	39
	>5 hours	16	6
Personal and behavioural variables			
Sharing personal problems	Yes	254	92
	No	21	8
Confident about ability to handle problems	Yes	171	62
	No	104	38
Trouble in concentrating or remembering	Yes	206	75
	No	69	25
Altered appetite	Yes	107	39
	No	168	61
Sleep hours in 24 hours	<6 hours	54	20
	6-8 hours	146	53
	>8 hours	75	27
Go for outing	Once a week	54	20
	Once in 15 days	71	26
	Once a month	125	45
	Once in 6 months	25	9
Family and social variables			
Interaction with	Few hours a day	233	85

Parents/Siblings	Once a day	24	9
	Once a week	14	5
	Once in 15 days	4	1
Mental health issues in family	Yes	20	7
	No	255	93
Family history of smoking/alcohol	Yes	116	42
	No	159	58
Nervous if your friends share happy moments about family	Yes	76	28
	No	199	72

The chart shows that moderate levels of depression (45%) and anxiety (38%) were most common among participants, followed by severe stress (36%). Around one-fourth had extremely severe anxiety (27%) and stress (29%). Only a small proportion of adolescents showed normal levels of depression (12%), anxiety (9%), and stress (9%).

Figure 1: Distribution of Depression, Anxiety, and Stress Levels Among Adolescents (n = 275)



A significant association was found between age category (p = 0.003), gender (p = 0.021), type of school (p = 0.045), socio-economic class (p = 0.01), sharing personal problems (p = 0.019), trouble in concentration (p = 0.021), sleep duration (p = 0.014), interaction with parents/siblings (p = 0.024), and family history of smoking/alcohol (p = 0.048) with depression.

Depression was more prevalent among middle adolescents, females, students from government schools, and those from lower socio-economic classes. Adolescents who did not share personal problems, had difficulty concentrating, less sleep, limited family interaction, and positive family history of substance use also showed higher levels of depression.

Table 3: Association Between Sociodemographic and Lifestyle Variables with Depression Among Adolescents

Variables	Category	Depression Absent	Depression Present	Chi-square	P-value
Age Category	Early Adolescent	2	67	11.074	0.003
	Middle Adolescent	32	161		
	Late Adolescent	0	13		
Gender	Female	29	158	5.333	0.021
	Male	5	83		
Schooling	Government	19	182	6.255	0.045
	Government Aided	0	3		
	Private	15	56		
Type of Family	Nuclear	21	164	3.795	0.261

	Joint	4	17		
	Third Generation	6	52		
	Separated	3	8		
Number of Children	1	7	15	8.155	0.066
	2	19	174		
	3	6	39		
	4	2	11		
	5	0	2		
Socio economic class	I	4	26	12.705	0.01
	II	6	97		
	III	11	72		
	IV	12	46		
	V	1	0		
Diet	Vegetarian	4	18	2.048	0.378
	Non-Vegetarian	0	12		
	Mixed	30	211		
Physical Activity	Yes	18	167	3.619	0.057
	No	16	74		
Willing to continue school	Yes	28	222	3.437	0.064
	No	6	19		
Regret going to school	Yes	8	33	2.273	0.132
	No	26	208		
Duration of time spent for study in 24 hours	<2 hours	9	112	5.231	0.06
	2-4 hours	23	114		
	>5 hours	2	15		
Sharing personal problems	Yes	28	226	5.512	0.019
	No	6	15		
Trouble in concentrating or remembering details	Yes	20	186	5.341	0.021
	No	14	55		
Sleep Hours in a day	<6 hours	3	51	8.468	0.014
	>8 hours	16	59		
	6-8 hours	15	131		
Go for outing	Once a week	3	51	4.121	0.245
	Once in 15 days	10	61		
	Once a month	16	109		
	Once in 6 months	5	20		
Interact with parent/sibling	Few hours a day	24	209	8.492	0.024
	Once a day	5	19		
	Once a week	5	9		
	Once in 15 days	0	4		
Family history of Smoking/Alcohol	Yes	9	107	3.927	0.048
	No	25	134		

A significant association was observed between age category (p = 0.016), type of school (p = 0.011), type of family (p = 0.001), number of children in the family (p = 0.001), socio-economic class (p = 0.012), and sleep duration (p = 0.024) with anxiety among adolescents.

Higher anxiety levels were found among middle adolescents, students from government schools, those belonging to nuclear families, families with two or fewer children, and lower socio-economic groups. Adolescents with less than six hours of sleep also exhibited higher anxiety symptoms.

Table 4: Association Between Sociodemographic and Lifestyle Variables with Anxiety Among Adolescents (n = 275)

Variables	**Category**	**Anxiety Absent**	**Anxiety Present**	**Chi-Square**	**P-Value**
Age category	Early adolescent	1	68	7.709	0.016

	Late adolescent	1	12		
	Middle adolescent	23	170		
Gender	Female	21	166	3.235	0.072
	Male	4	84		
Schooling	Government	12	189	8.823	0.011
	Government Aided	0	3		
	Private	13	58		
Type of Family	Nuclear	14	171	16.176	0.001
	Joint	4	17		
	Third Generation	2	56		
	Separated	5	6		
Number of Children	1	6	16	17.214	0.001
	2	10	183		
	3	5	40		
	4	4	9		
	5	0	2		
Socio-Economic Class	I	2	28	12.223	0.012
	II	4	99		
	III	7	76		
	IV	12	46		
	V	0	1		
Diet	Vegetarian	5	17	4.836	0.067
	Non-Vegetarian	1	11		
	Mixed	19	222		
Physical Activity	yes	14	171	1.587	0.208
	no	11	79		
Sleep Hours in a day	<6 hours	3	51	7.439	0.024
	>8 hours	13	62		
	6-8 hours	9	137		
Interact with parent/sibling	Few hours a day	19	214	5.5	0.105
	Once a day	2	22		
	Once a week	4	10		
	Once in 15 days	0	4		
Mental health issues in Family	Yes	3	17	0.911	0.34
	No	22	233		
Family history of Smoking/Alcohol	Yes	8	108	1.169	0.28
	No	17	142		

A significant association was found between age category (p = 0.011), gender (p = 0.025), type of school (p = 0.002), father's occupation (p = 0.003), type of family (p = 0.019), number of children (p = 0.001), socio-economic class (p = 0.001), and sleep duration (p = 0.003) with stress among adolescents.

Stress was more prevalent among middle adolescents, females, students studying in government schools, those whose fathers were daily wage workers, and those from nuclear or smaller families with lower socio-economic status. Adolescents with less than six hours of sleep per day were also found to have higher stress levels.

Table 5: Association Between Sociodemographic and Lifestyle Variables with Stress Among Adolescents (n = 275)

Variables	**Category**	**Stress Absent**	**Stress Present**	**Chi-square**	**P-value**
Age Category	Early Adolescent	1	68	8.923	0.011
	Late Adolescent	0	13		
	Middle Adolescent	24	169		
Gender	Female	22	165	5.055	0.025
	Male	3	85		
Educational institution	Government	11	190	12.15	0.002

	Government Aided	1	2		
	Private	13	58		
Father Occupation	Daily Wager	3	122	16.789	0.003
	Business	7	44		
	Agricultural Land Holding	9	48		
	Livestock	0	2		
	Died	1	2		
	Others	5	32		
Type of Family	Nuclear	15	170	9.137	0.019
	Joint	3	18		
	Third Generation	3	55		
	Separated	4	7		
Number of Children	1	6	16	17.214	0.001
	2	10	183		
	3	5	40		
	4	4	9		
	5	0	2		
Socio-Economic Class	I	2	28	16.889	0.001
	II	3	100		
	III	8	75		
	IV	11	47		
	V	1	0		
Diet	Vegetarian	4	18	2.846	0.193
	Non-Vegetarian	0	12		
	Mixed	21	220		
Physical Activity	Yes	13	172	2.914	0.088
	No	12	78		
Regret going to school	Yes	6	35	1.791	0.181
	No	19	215		
Duration of time spent for study in 24 hours	<2 hours	7	114	3.358	0.159
	2-4 hours	17	120		
	>5 hours	1	16		
Sleep Hours in 24 hours	<6 hours	0	54	11.062	0.003
	>8 hours	12	63		
	6-8 hours	13	133		
Go for Outing	Once a week	1	53	6.617	0.07
	Once in 15 days	9	62		
	Once a month	11	114		
	Once in 6 months	4	21		
Mental Health Issues in Family	Yes	3	17	0.911	0.34
	No	22	233		

DISCUSSION

The present study among adolescents in Chengalpattu district revealed a high prevalence of mental health disorders, with 45.1% experiencing stress, 37.8% anxiety, and 35.6% depression. These rates far exceed those reported by Kumar R. et al. (2022) in Telangana, where public-school students showed lower frequencies of stress (15.8%), anxiety (20.8%), and depression (5%), while private-school students reported 20.1%, 20.5%, and 1.9%, respectively. Such discrepancies emphasize the need for region-specific mental health programs, reflecting differences in socio-cultural context, academic systems, and methodology employed across studies (14).

Depression, anxiety, and stress were significantly related to age, gender, educational institution, and

socioeconomic status. Early adolescents reported the highest emotional disturbances, with more than 97% experiencing sadness, anxiety, and stress, highlighting heightened vulnerability during the transition period. Females also exhibited greater susceptibility (84.5–88.8%) compared to males, consistent with Akhtar-Danesh N. et al. (2007), who observed higher odds of depression among women across social contexts. Similar to their findings, our results show the complex interplay of demographic and social determinants—including family status, education, and income—in shaping mental health outcomes (15). Adolescents studying in government schools and those from lower socioeconomic strata (Class IV) displayed elevated rates of distress, suggesting socioeconomic adversity as a critical risk factor.

Family environment emerged as an important determinant of adolescent mental well-being. Stress levels were higher among those from nuclear families (91.9%) compared to joint or extended families, likely due to reduced social support. Limited family interaction also magnified psychological distress, as nearly 90% of participants spending little time with family reported stress. A family history of substance use further aggravated depression risk (92.2%). Lifestyle characteristics such as poor sleep and physical inactivity also contributed significantly. Participants sleeping less than six hours a night showed universal stress (100%) and high anxiety levels (94.4%). Conversely, physical activity displayed a mild protective effect. Although BMI and diet were not strongly associated, these trends highlight the advantage of promoting daily exercise and adequate sleep for mental resilience. These associations align with prior findings linking low family affective involvement and high conflict to emotional and behavioral issues (Auerbach & Ho, 2012; Hughes et al., 2008; Knappe et al., 2009). Over- or under-involved family structures can both contribute to adolescent maladjustment, emphasizing the role of balanced emotional participation in fostering healthy stress responses (16–24).

Academic satisfaction showed a mild but notable association with stress and anxiety. Students dissatisfied with their performance had higher anxiety (46.7%) and stress (48.2%) relative to satisfied peers, suggesting academic self-appraisal plays a psychological role. As per control-value theory (Pekrun, 2006), fear of negative evaluation from peers or teachers contributes to performance anxiety. The Yerkes–Dodson law further explains that heightened fear of poor grades impairs both scientific reasoning and communication abilities in class (25,26). However, screen time and study duration exhibited no meaningful associations with emotional outcomes, paralleling observations by Muppalla S. et al. (2023), who noted that such variables are not direct determinants but might operate through mediating psychosocial factors (27).

However, the study also has certain limitations. As it was conducted in rural areas, the findings cannot be generalized to urban populations. The reliance on self-reported data may have introduced social desirability bias, potentially affecting the accuracy of responses. Moreover, the cross-sectional design restricts the ability to establish causal relationships between variables, and the lack of longitudinal follow-up limits insights into the progression or long-term impact of mental health conditions among adolescents.

CONCLUSION AND RECOMMENDATIONS

The study in Chengalpattu showed a high prevalence of depression, anxiety, and stress among adolescents, particularly females, early teens, and those from low socioeconomic backgrounds and government schools. Poor sleep and weak family interactions were major contributors, while physical inactivity played a lesser role. Emotional distress was more linked to social and personal factors than academics. Strengthening adolescent mental health requires school counseling, family-centered interventions, health promotion, and targeted support for vulnerable groups. Capacity-building for teachers and health workers, along with research on social and lifestyle determinants, can foster holistic adolescent well-being.

Conflict of interest: Nil

Financial support: Nil

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