

ORIGINAL RESEARCH

Stress, Anxiety and Depression Among School-going Adolescents in Rural District of Tamil Nadu-Cross-sectional Study

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ABSTRACT

Introduction: Adolescence is a transitional period where inadequate/bad guidance may have negative influences on self-esteem, emotional well-being, and values, with potential consequences including stress, anxiety, depression, and other behavioral issues that may negatively influence the future life of the individual. **Objectives:** To determine the prevalence and risk factors of stress, anxiety, and depression among school-going adolescents. **Material and methods:** The cross-sectional study is conducted among 462 Government school students of mid and late adolescence in the Kanchipuram district. The semi-structured questionnaire and DASS-21 scale were used to collect data on predictors and outcome variables. The epi-info 7 version was used to analyse data. The significance was tested using the Chi-square test and multivariate analysis. **Results:** The prevalence of stress, anxiety, and depression was 39.2%, 43.5% and 34.4% with a mild grade of severity being higher in all three outcomes. The students with poor academic satisfaction and low self-esteem were significant risk factors for all three outcomes. Students of joint and broken families and poor academic performance was found to be significant risk factor for anxiety and depression. Adolescents with working mothers and the presence of parental alcohol use were found to be significant risk factors for depression. **Conclusion:** The high prevalence of any one of the stress, anxiety or depression reflects the need for periodical life skill sessions for adolescents and regular screening for mental health problems to be conducted in school.

Keywords: Anxiety, Depression, Adolescents, school

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BACKGROUND

Adolescence, a term originating from the Latin word "adolescere" denoting growth.¹ World Health Organization defines adolescents as individuals between the ages 10 and 19 years and in 2019, they accounted for 16% of the global population.² This transitional period is characterized by a complex interplay of physical, psychological, social, and cultural changes and also they achieve physical and sexual maturity before cognitive maturity, so proper guidance is needed for them to understand the transition. Inadequate/bad guidance may have negative influences on self-esteem, emotional well-being, and values, with potential consequences including stress, anxiety, depression, and other behavioural issues.^{1,3} Mental health disturbances in adolescents constitute a heavy burden to society because they may lead them to delinquency, substance abuse, and an

increase in violent behaviours and negatively influence the future life of the individual.⁴

According to the National Mental Health Survey of India (2015–2016), the prevalence of psychiatric disorders is around 7.3%.⁵ The prevalence of stress, anxiety and depression among Indian adolescents is 13–45%, 16–17.2% and 1.2–21% as per previous studies.^{6–8} Depression and anxiety are more in the middle (14–17 years) and later adolescence (17–19 years) compared to the early adolescent period (11–13 years of age) due to increased academic stress, peer pressure and ideation. So, this study is conducted among ages 14 and above.^{9–11}

The health situation of the adolescent age group is a key determinant of a country's overall health, mortality, morbidity and population growth scenario. Realizing this, the Government of India have implemented healthcare programmes to address the problems of adolescents.¹² But all these programmes

have strategies focused more on nutritional & reproductive aspects. The government policies and programmes having holistic strategies and approaches towards diagnosis and treatment for adolescent mental health disorders are very limited.

In the above context, this study is conducted to assess the prevalence and risk factors of Stress, anxiety and depression for enabling early diagnosis in order to reduce psychological morbidity and to add information on mental health problems database which will be helpful in framing new policies and programmes on adolescent mental health.

METHODOLOGY

This is a cross-sectional study conducted in Government higher secondary schools in Kanchipuram district of Tamil Nadu during January 2021-December 2022. Multistage sampling was done. As our participants' age groups are mid and late adolescents, the class 9th to 12th standard was selected. There were around 44 Government higher secondary schools in Kanchipuram district, three schools were selected by Random sampling. Among the 34 sections (average of 40 students in each section), 12 sections were selected (4 from each school) by simple random sampling and all the students in selected sections were eligible for participation.

Sandal et al. reported the prevalence of stress as 47.02% among school students.¹¹ With p as 47.02%, 5% alpha error and 5% absolute precision, the sample calculated was 399. By including 10% for non-responders, the total sample size was 439.

Necessary permissions were obtained from the headmaster/mistress of the schools. One day prior to the day of the study, the participants were given a written consent form to obtain permission from parents for participation in this study. On the day of the study after obtaining oral assent from participants, the pretested semi-structured questionnaire for risk factors and standard scales were administered

Dependent variables

- a) Stress, anxiety and depression: Score more than or equal to 11, 7 and 10 as per DASS 21 stress, anxiety and depression subscale.¹³

Table 1: Prevalence of grade of stress, anxiety and depression

Grade	Stress		Anxiety		Depression	
	N	% (95% C.I)	n	% (95% C.I)	n	% (95% C.I)
Mild	107	23.2 (19.5-26.8)	104	22.5(18.8-26.2)	93	20.1(16.5-23.6)
Moderate	55	11.9 (9.1-15.2)	78	16.9(13.2-20.3)	54	11.7(8.9-14.7)
Severe	16	3.5 (1.7-5.2)	14	3.0 (1.5-4.8)	10	2.2 (0.9-3.7)
Extremely severe	3	0.6 (0-1.5)	5	1.1 (0.2-2.2)	2	0.4 (0.0-1.1)
Total	181	39.2 (35.1-43.5)	201	43.5(39-47.8)	159	34.4(30.5-38.7)

Our study results show the prevalence of stress, anxiety and depression to be 39.2%, 43.5% and 34.4% with a mild grade of severity being higher in all three outcomes.(Table 1). Among the participants, there

Predictor variables

- Socio-demographic variables- 1. Adolescence-middle or late;¹⁴ 2. Board exam appearance(X & XII Std);¹⁵ 3. mother working or not¹⁶ and 4. Type of family-nuclear, joint, broken or others.¹⁷
- Academic-related predictor variables – 1. Performance in school- good (>50% score in last two exams) or poor based on the score card. 2. Student satisfaction on their academic performance was assessed by Likert scale with scoring 0-3. The scores ≤ 1 were considered to be not satisfied.
- Life style predictors: 1. Time spent on physical activity-Participant spending less than one hour per day on any type of physical activity like playing games, sports or doing any exercises is considered to be spending less time on physical activity.¹⁸ 2. Screen time per day Participants spending duration of more than 2 hours per day on any electronic media are considered to have high screen time.¹⁹
- Other Predictor variables: 1. Physical abuse is assessed by a questionnaire structured with yes or no format from the Abuse assessment screen tool.²⁰ 2. Alcohol use/abuse in parents was done by questionnaire which is structured from children of alcoholic screening test- CAST scale.²¹ 3. Rosenberg self-esteem scale score less than 15 were considered to have poor self-esteem²²

Data analysis

The data collected and scored were entered in MS Excel and analyzed using the Epi info 7 version. Prevalence is presented as proportions with 95% Confidence Interval. Chi-square test is done to find the significant predictors of stress, anxiety and depression. Multivariate logistic analysis is then performed by including the significant predictor variables from bivariate analysis. The association is expressed in crude and adjusted Odds Ratio with 95% Confidence interval and p value < 0.05.

RESULTS

All the students of 12 sections selected were included in our study so in total 462 students were enrolled in our study. The students who were not present even after two visits were excluded from the study

were 10 students (2.16%) had extremely severe grades of either stress, anxiety or depression.

Around 62.7% (n=290) of the participants had at least any one among stress, anxiety or depression. Also,

16.4% (n=76) of the participants had only one of the stress, anxiety or depression, 38.3%(n=177) had any two of the outcome variables and 8% of the participants had all the three. (Figure1)

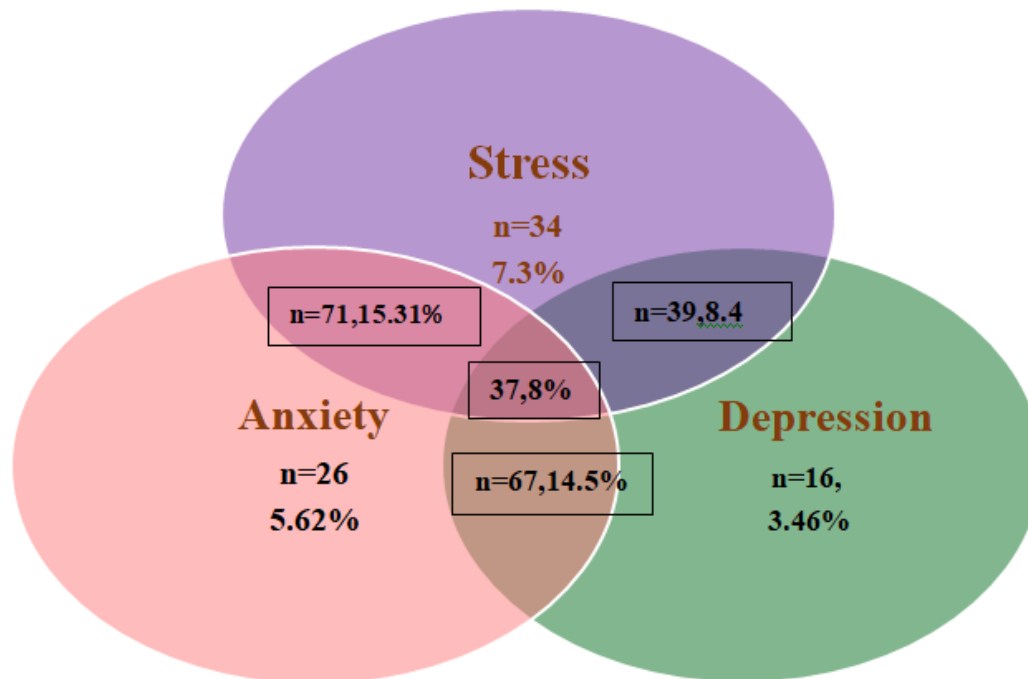


Figure 1: Intra distribution of Stress, Anxiety & Depression (N=462)

Table 2: Bivariate analysis of socio-demographic and academic variables studied with dependent variables

Variables (N)	STRESS (n=181)		ANXIETY (n=201)		DEPRESSION (n=159)	
	n(%)	O.R	n(%)	O.R	n(%)	O.R
1. Adolescent period						
Mid (316)	124 (39.2)	1.01	138 (43.7)	1.02	210 (66.5)	1.1
late (146)	57(39)	(0.67-1.5)	63 (43.2)	(.69-1.52)	93(63.7)	(0.74-1.7)
2. Exam type						
Board (248)	111 (44.8)	1.66*	131 (52.8)	2.30*	101 (40.7)	1.98*
Non-board (214)	70 (32.7)	(1.1-2.4)	70(32.7)	(1.5-3.3)	58 (27.1)	(1.3-2.9)
3. Gender						
Female(258)	114 (44.2)	1.61*(1.10-	121 (46.9)	1.36	97 (37.6)	1.38
Male (204)	67 (32.8)	2.37)	80 (39.2)	(0.93-1.99)	62 (30.4)	(0.93-2.03)
4. Mother working						
Yes (262)	106 (40.5)	1.13(0.77-	116(44.3)	1.07	104(39.7)	1.73*
No (200)	75 (37.5)	1.63)	85 (42.5)	(0.74-1.55)	55(27.5)	(1.16-2.58)
5. Type of family						
Nuclear(265)	101(38.1)	REF	103 (38.9)	REF	79 (29.8)	REF
Joint(127)	51 (40.2)	1.09(0.7-	67 (52.8)	1.75*	53 (41.7)	1.68*
Broken(70)	29 (41.4)	1.14(0.6-	31(44.3)	1.25	27 (38.6)	1.47
		1.9)		(0.7-2.1)		(0.8-2.5)
6. Academic performance						
Poor (175)	88 (50.3)	2.11*	143 (81.7)	17.6*(10.9-	80 (45.7)	2.2*
Good (287)	93 (32.4)	(1.4-3.1)	58 (20.2)	28.4)	79 (27.5)	(1.4-3.2)
7. Student satisfied with academic performance						
No (210)	116(55.2)	3.55*	152(72.4)	10.8*	137 (65.2)	19.6
Yes (252)	65 (25.8)	(2.3-5.2)	49 (19.4)	(7-16.7)	22 (8.7)	(11.6-33)*

In bivariate analysis, the adolescent period had no significant association with stress, anxiety and depression. The students belonging to the public board exam, poor academic performance and poor satisfaction with their academics group had significantly higher odds of all three outcome

variables studied compared to their complementary group. Female gender had a significantly higher prevalence of stress and adolescents of working

mother had higher prevalence of depression. Anxiety and depression are significantly higher in adolescents belonging to joint family. (Table 2)

Table 3: Bivariate analysis of Lifestyle and other predictor variables studied with dependent variables

Variables (N)	STRESS (n=181)		ANXIETY (n=201)		DEPRESSION (n=159)	
	n(%)	O.R	n(%)	O.R	n(%)	O.R
1. Screen time >2 hr/day						
Yes(358)	160 (44.7)	3.1*	178 (49.7)	3.4*	154 (43)	14.9*
No(104)	21 (20.2)	(1.8-5.3)	23(22.1)	(2-5.7)	(4.8)	(5.9-37.5)
2. Time spent on physical activity<1 hr/day						
Yes(302)	135 (44.7)	2*	153 (50.7)	2.3*	124(41.1)	2.4*
No(160)	46 (28.8)	(1.3-3)	48(30)	(1.5-3.5)	(21.9)	(1.6-3.8)
3. Physical abuse						
Yes(108)	65(60.2)	3.1*	65(60.2)	2.4*	62 (57.4)	3.5*
No (354)	116 (32.8)	(1.9-4.8)	136 (38.4)	(1.5-3.7)	27.4)	(2.2-5.5)
4. Alcohol use in parents						
Yes (214)	100 (46.7)	1.8*	114(53.3)	2.1*	110 (51.4)	4.2*
No (252)	81 (32.7)	(1.2-2.7)	87 (35.1)	(1.4-3)	19.8)	(2.8-6.4)
5. Self esteem						
Low (212)	112(52.8)	2.9*	132 (62.3)	4.3*	104 (49.1)	3.4*
High(250)	69 (27.6)	(1.9-4.3)	69 (27.6)	(2.9-6.4)	55 (22)	(2.2-5.1)

Among the risk factors studied, screen time > 2 hours/day, physical activity<1 hour /day, presence of physical abuse, presence of alcohol use or abuse in parents and low self-esteem were found to be significant risk factors of stress, anxiety and depression.(Table 3)

Table 4: Multivariate analysis of predictors of stress

Predictor variables	Category	C.O.R	A.O.R	95% C.I		P value
				Lower Bound	Upper Bound	
	Board	1.6*	1.16	0.75	1.74	0.490
	Non-Board	1	1	-	-	-
Exam type	Female	1.6*	1.29	0.83	1.99	0.250
	Male	1	1	-	-	--
Student satisfaction with academics	Not satisfied	3.5*	1.91	1.21	3.02	0.005**
	Satisfied	1	1	-	-	-
Academic performance	Poor	2.1*	1.28	0.82	1.99	0.265
	Good	1	1	-	-	-
Screen time /day	> 2 hours	3.1*	1.62	0.84	3.12	0.144
	< 2 hours	1	1	-	-	-
Physical activity/day	Less than 1 hr	2*	1.18	0.70	2.0	0.517
	More than 1 hr	1	1	-	-	-
H/o physical abuse	Yes	3.1*	2.33	1.3	4.19	0.004**
	No	1	1	-	-	-
Parent alcohol abuse	Yes	1.8*	0.9	0.53	1.50	0.688
	No	1	1	-	-	-
Self-esteem	Low	2.9*	1.84	1.9	2.84	0.006**
	High/normal	1	1	-	-	-

The variables significantly associated in bivariate analysis were subjected to multivariate analysis. The students with poor satisfaction with academics had 1.91 times higher odds of stress, the adolescents with physical abuse and poor self-esteem had 2.33 and 1.84 times higher odds of stress respectively. (Table 4) The multivariate analysis for predictors of anxiety shows students going for board exams (10+12th

standard class of study) had 2.17 times higher odds of anxiety compared to the non-board group. Adolescents belonging to joint and broken families have 2.2 and 1.1 times higher odds of anxiety respectively. Poor satisfaction with academics, poor academic performance and poor self-esteem were found to be significant risk factor of anxiety.(Table 5)

Table 5: Multivariate analysis of predictors of anxiety

Predictor variables	Category	C.O.R	A.O.R	95% C.I		P value
				Lower Bound	Upper Bound	
Exam type	Board	2.3*	2.17	1.21	3.88	0.009**
	Non-Board	1	1			
Type of family	Nuclear	1	1			
	Joint	1.7*	2.2	1.15	4.17	0.016**
	Broken	1.2	1.1	0.45	2.42	0.905
Student satisfaction with academics	Not satisfied	10.8*	7.27	3.99	13.2	<0.001**
	Satisfied	1	1			
Academic performance	Poor	17.6*	19.57	10.58	36.20	<0.001**
	Good		1			
Screen time /day	> 2 hours	3.4*	1.66	0.71	3.87	0.237
	< 2 hours	1	1			
Duration of physical activity/day	Less than 1 hour	2.3*	0.99	0.51	1.95	0.997
	More than 1 hour	1	1			
H/o physical abuse	Yes	2.4*	1.05	0.49	2.27	0.885
	No	1	1			
Parent alcohol abuse	Yes	2.1*	1.35	0.68	2.65	0.387
	No	1	1			
Self-esteem	Low	4.3*	2.39	1.34	4.27	0.003**
	High//normal	1	1			

Table 6: Multivariate analysis of predictors of depression

Predictor variables	Category	C.O.R	A.O.R	95% C.I		P value
				Lower	Upper	
Exam type	Board	1.8*	1.34	0.76	2.35	0.309
	Non-Board		1			
Mother working	YES	1.7*	1.75	1.01	3.06	0.048**
	NO		1			
Type of family	Nuclear		1			
	Joint	1.7*	2.23	1.18	4.21	0.013**
	Broken		1.13	0.51	2.49	0.760
Student satisfaction	Not satisfied	19.6*	14.11	7.63	26.07	<0.001**
	Satisfied		1			
Academic performance	Poor	2.2*	0.89	0.50	1.56	<0.686
	Good		1			
Screen time /day	> 2 hours	14.9*	12.41	3.85	39.62	<0.001**
	< 2 hours		1			
Physical activity/day	Less than 1 hr	2.4*	0.744	0.36	1.50	0.410
	More than 1 hr		1			
H/o physical abuse	Yes	3.5*	1.14	0.54	2.39	0.712
	No					
Parent alcohol abuse	Yes	4.2*	4.19	2.1	8.33	<0.001**
	No					
Self-esteem	Low	3.4*	1.66	0.94	2.93	0.080
	High					

*p-value significant by bivariate analysis

** p-value significant in multivariate analysis

The multivariate analysis of risk factors for depression shows adolescents with working mothers, and adolescents with joint families had 1.75 and 2.23 times higher odds of depression compared to non-working mothers and nuclear families respectively. Poor academic performance, poor student satisfaction, the presence of parental alcohol use and poor self-esteem

were found to be significant risk factors of depression. (Table 6)

DISCUSSION

The prevalence of stress, anxiety and depression (DAS) in our study population is 39.2%, 43.5% and 34.4%. The prevalence of outcome variables in our study result is lower than the study

done in New Delhi showing the prevalence of stress, anxiety and depression as 51.8%, 68.3% & 47.9%.²³ This difference may be attributed to rural-urban differences of stressors and other risk factors. The prevalence of anxiety was high when compared to stress in our study which is similar to the studies done among adolescents in Manipal, India and study in Saudi Arabia.²⁴

A study done in Imphal shows among adolescents who had stress, anxiety and depression, around 34.7% had all three negative states which is higher compared to our study results which showed that only 8% had all three negative states.²⁵

The high prevalence of anxiety among public board exam appearing students in our study can be attributed to high academic stress, high uncertainty of the exam results by the individuals, lack of time for physical activity or other recreational activities due to spending more time on academics, more constraints incorporated by parents and teachers, more expectation of teacher and parents on their academic caliber. Our study results are similar to the studies done in the schools in Chandigarh,¹¹ Delhi²⁶ and Karnataka²⁷ which showed class X+XII students had high odds of DAS.

The higher odds of depression among the children of working mothers observed in our study is similar to a study in Bangladesh which reports depression to be significantly high in children of working mothers and this can be attributed to increased loneliness and less self-efficacy in adolescents of working mother compared to unemployed mothers.²⁸

Similar to our study results, Sudan study has shown students who poor academic performance in exams have higher odds of anxiety and depression.²⁹ Also participants not satisfied with their academic performance have higher odds of all three outcome which may be due to high competition with peers in getting good marks, fear of comparison or difference in expected & actual marks in exams. These results are similar to that of the study done to assess stress, anxiety and depression in Delhi adolescents.²³

In our study, 2/3rd had less than one hour of physical activity which may be because of time constraints due to going to tuition and more time spent on television or electronic gadgets. Also, 77.5% of participants in our study have screen time of more than 2 hrs per day which is higher than the study done in school adolescents in New Delhi which states that around 68% of adolescents have more than 2 hours of screen time /day.³⁰ The population-based study have shown results similar to our study with high screen time adolescents are twice at risk of depression.³¹ Studies done in China³² and Malaysia³³ have shown adolescents with lack of physical activity have high prevalence of stress, anxiety and depression, similar to results of our study. Our study result shows 23.38% of participants had history of physical abuse in the last one month which is similar to the study done in South India which

states 11.8-56.7% of college students had history of physical abuse during childhood and adolescent period.³⁴ Similar to our study result, the studies done in China³⁵ and USA³⁶ states physical abuse victims are more at risk of developing moderate to severe depression and stress.

Alcohol abuse in parents was found to be 46.32% in our study which is the same as NFHS-4 result which states around 47.4% of rural male and 0.3 % of rural female have alcohol drinking habits in Tamil Nadu.³⁷ A study in Bangalore, India that compared the children mental health of alcoholic and non alcoholic parent showed significantly higher association of depression, phobia and low self esteem in children of alcoholic parents.³⁸

In our study results, 45.4% of the total participants had low self-esteem which is higher than the study done in U.S. adolescents which had only 13.6% of low self-esteem.³⁸ This dissimilarity may be due to differences in measurement tools or due to differences in study place where culture, school environment may influence. Study done by Nguyen et. al⁴⁰ also found that low self-esteem students had higher odds of stress, anxiety and depression as the current study result.

CONCLUSION

The high prevalence of any one of the stress, anxiety or depression, low self-esteem and student dissatisfaction reflects the need for periodical life skill sessions for adolescents and regular screening for mental health problems to be conducted in school. Our study also recommends the need for special focus and holistic strategies on adolescent mental health in existing national health programs and policies.

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