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Original Research Article

Psychological patterns in pre-graduate students in Tirupati district

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ABSTRACT

Background: Adolescent age can be a stressful experience for young people with a wide range of concerns. Comprehensive studies on psychological patterns among pre-graduate students in India are meagre. Therefore, this study aimed to assess psychological morbidities and quality of life in them.
Methods: The study recruited 567 students aged 15-18 years, who pursued pre-graduate courses at government (300) and private (267) colleges in and around Tirupati and Chandragiri, Andhra Pradesh, India. Information was collected about their physical and psychological health, substance abuse and usage of electronic gadgets. The levels of stress, anxiety, depression, and sleeplessness were assessed.
Results: A significant association was observed in the levels of stress, anxiety, and depression among government and private college students at levels of 1%, 10% and 5%, respectively. Higher levels of depression were observed in 44.8% of students; depression was high in girls and government college students. Often, girls experience higher levels of stress leading to psychological illnesses than boys due to their inability to share their feelings and fears among family members. The proportion of poor family health indicators was significantly high in students with moderately low levels of anxiety. Poor sleep had decreased as the depression worsened from borderline to higher levels in boys and decreased even with mild mood disturbances in girls.
Conclusions: Management strategies at personal, institutional and social levels are to be developed after understanding the risk factors of psychological morbidities in students.

Keywords: Adolescents, Psychological morbidities, Quality of life

INTRODUCTION

Adolescence is the transitional phase before a child develops into an adult, where intense physical, psychological, and cognitive developments take place. During this period, psychological growth plays a vital role in the character and personality development of adolescents. Poor psychological conditions at this point have been shown to increase the risk of injury and substance use, affecting the quality and life expectancy.[1,2]

Worldwide (2021), the burden of mental disorders among 10-19 year old adolescents is 13% and one in seven adolescents experience the disorder. The primary causes of

illness and disability among adolescents are anxiety, depression and behavioural disorders.[3] According to World Health Organisation (WHO) Mental Health Atlas (2005) and Singh et al, the prevalence of psychiatric morbidities among adolescents in India was 14.4% and 31.7%, respectively.[4,5] Studies conducted on Indian adolescents from 2004 to 2012 revealed an increase in the prevalence of depression from 18.4% to 60.7% and around 10% to 20% experienced psychological morbidities. Moreover, it was shown that in 50% of adults with psychological morbidities, the appearance of such morbidities was in their mid-adolescent age. The majority of the adolescents who committed suicide (88%) were from low- and middle-income countries where nearly 90% of the global adolescents live.[6] Among moderately or severely depressed adolescents in Mumbai, 40.9% were pre-graduate students. A significant factor in developing depressive symptoms in adolescents was sleeplessness.[7] The family environment and the relationship between family members were significantly linked to stress and depression levels as well. Levels of stress and anxiety vary considerably between teenagers studying in government and private institutions.[5]

School can be a stressful experience for youth with worries about studying, peer pressure, family issues and future decisions. Comprehensive studies dealing with stress, anxiety, depression, sleeplessness and quality of life among pre-graduate students in India are limited. The current study aimed to assess psychological morbidities and quality of life in students pursuing their intermediate (pre-graduation/higher secondary) courses.

METHODS

A cross-sectional pilot study was conducted to assess the levels of stress, anxiety, depression, and sleeplessness among pre-graduate (Intermediate/ +1 and +2 courses) students in Chandragiri and Tirupati, Andhra Pradesh, from November 2018 to February 2020. Approval from the institutional ethics committee was obtained from S.V. Medical College, Tirupati. As it was a pilot study, all students from the selected colleges who were willing to participate were included after obtaining prior permission from the college authorities and securing individual written consents.

A semi-structured questionnaire was administered to each subject to obtain information about their physical and psychological health, substance abuse and usage of electronic gadgets. Psychological health and its associated factors were assessed by the following scales/questionnaires: stress (Perceive Stress questionnaire), anxiety (Beck's Anxiety Inventory), depression (Beck's Depression Inventory); and sleep quality (Pittsburgh Sleep Quality Index (PSQI)), family environment (Family Assessment Device (FAD)) and quality of life (WHO Quality of Life (WHOQOL)). The details of the domains and scales used for the study are provided below.

The WHOQOL assessment encompasses four broad domains that are integral to a person's well-being. The physical domain includes aspects such as health-promoting daily activities, reliance on medication and medical aids, energy levels, mobility, pain management, quality of sleep and rest, and work capacity. The psychological domain covers one's body image, emotional spectrum ranging from negative to positive feelings, self-worth, spiritual beliefs or personal convictions, and cognitive functions like thinking and memory. Social interactions are encapsulated in the social relationship's domain, which considers the depth of personal relationships, the extent of social support available, and sexual activity. Lastly, the environmental domain reflects on an individual's material resources, personal safety, access to healthcare services, home setting, learning opportunities, leisure activities, environmental quality including pollution and climate, and transportation facilities.

The Family Assessment Device (FAD) is a tool designed to evaluate seven key dimensions of family functioning. The problem-solving scale assesses a family's ability to resolve issues effectively, maintaining the overall health of the unit. Communication within a family is gauged by the clarity and direction of messages exchanged, with four identified styles ranging from clear to masked, and direct to indirect. Roles within the family are defined by consistent behaviours that fulfil duties such as resource provision, support, sexual relationship satisfaction, personal development, and system maintenance. The affective response scale measures the family's capacity to experience and accept a full range of emotions appropriate to different situations. Affective Involvement looks at how much interest family members show in each other's significant activities, with six levels of involvement identified, from lack of involvement to symbiotic involvement. Behaviour control evaluates how families manage potentially harmful situations, desires, and social interactions, with styles ranging from rigid to chaotic. Lastly, general functioning is seen as a comprehensive indicator of typical family dynamics.

In addition, weight, pulse rate, respiratory rate and blood pressure were also recorded.

The psychological parameters and their factors were categorised as below.

The perceived stress score ranges from 0 to 90, with 0-30 indicating low stress, 31-60 reflecting moderate stress, and 61-90 signifying high perceived stress. The beck anxiety score measures anxiety on a scale from 0 to 63, where 0-21 is considered low anxiety, 22-35 moderate anxiety, and scores of 36 or higher may indicate concerning levels of anxiety. For beck depression, scores range from 0 to 63, with 0-10 being normal, 11-16 suggesting mild mood disturbances, 17-20 borderline clinical depression, 21-30 moderate depression, 31-40 severe depression, and over 40 extreme depressions. The Global Pittsburgh Sleep Quality Index scores sleep quality on a scale from 0 to 21, with

higher scores indicating more severe difficulties in sleeping; a score of 5 or above is categorized as a poor sleeper. The WHOQOL uses a scoring system of 4-20 or 0-100, with higher scores implying a higher quality of life within the defined domains. Lastly, the Family Assessment Device (FAD) scores from 1 to 4, with 1 indicating healthy family functioning and 4 indicating unhealthy dynamics in the defined scales.

The mean difference in weight, pulse rate, respiratory rate, systolic and diastolic blood pressure, global score, WHOQOL domains, and FAD scales of students concerning stress, anxiety and depression versus type of college and gender were compared. The association and homogeneity in the frequency of hospitalization, history of substance abuse, poor sleep and details of physical and psychological illnesses among different levels of stress, anxiety and depression against a type of college and gender were analysed.

Statistical analysis

A descriptive analysis was performed to assess the prevalence of psychological morbidities with gender, type of college, and quality of sleep. A one-way ANOVA was utilized to evaluate the significance of differences between the groups. Subsequently, the Tukey HSD test was applied to examine the pairwise differences among the psychological morbidity scaling parameters and their determinants. This analysis was executed using SPSS version 21.0 (SPSS Inc., Chicago, IL, USA).

RESULTS

This study recruited 567 students aged between 15-18 years, pursuing intermediate courses at government (300) and private (267) colleges in and around Tirupati and Chandragiri. Of these 567, 273 were boys and 294 were girls.

Table 1 revealed that hospitalization was high in private college students during the past year. Physical, and psychological illnesses and specific phobias were higher in girls. Further, physical and psychological illnesses were high in private college girls and boys, respectively. History of pain and obsessive-compulsive disorder (OCD) were high in private colleges while history of trauma was higher in government college students. The use of electronic gadgets and mobile phones was high in private college students; especially high usage of mobile phones (≥4 hours/day) was seen in private college boys. Pulse and respiratory rates were higher in girls of government and private colleges compared to boys.

Table 1: Distribution of the study parameters with respect to each gender and type of college.

Type of college	Government		Private	
	Girls (n=171)	Boys (n=129)	Girls (n=123)	Boys (n=144)
Parameters				
Hospitalized during past year*	9 (5.3)	9 (7.0)	16 (13.0)	27 (18.8)
Having physical illness*	81 (47.4)	20 (15.5)	69 (56.1)	24 (16.7)
Having psychological illness*	76 (44.4)	14 (10.9)	57 (46.3)	78 (54.2)
H/o substance abuse	32 (18.7)	17 (13.2)	22 (17.9)	31 (21.5)
H/o pain*	119 (69.6)	77 (59.7)	101 (82.1)	90 (62.5)
Have social phobia	91 (53.2)	80 (62.0)	65 (52.8)	70 (48.6)
Have specific phobia*	91 (53.2)	34 (26.4)	74 (60.2)	61 (42.4)
Have OCD*	27 (15.8)	22 (17.1)	47 (38.2)	37 (25.7)
Have reading/writing disorder	36 (21.1)	30 (23.3)	27 (22.0)	24 (16.7)
H/o head trauma*	22 (12.9)	49 (38.0)	5 (4.1)	25 (17.4)
H/o epilepsy	5 (2.9)	3 (2.3)	5 (4.1)	5 (3.5)
Using electronic gadgets*	38 (22.2)	104 (80.6)	121 (98.4)	140 (97.2)
Usage of mobile*				
Don't use	150 (87.7)	43 (33.3)	11 (8.9)	7 (4.9)
<4 hours/day	19 (11.1)	74 (57.4)	94 (76.4)	98 (68.1)
≥4 hours/day	2 (1.2)	12 (9.3)	18 (14.6)	39 (27.1)
Hypertensive	1 (0.6)	2 (1.6)	2 (1.7)	5 (3.5)
$Pulse rate**				
Low (<60)	5 (2.9)	4 (3.1)	1 (0.8)	1 (0.7)
Normal (60-100)	153 (90.0)	121 (93.8)	108 (88.5)	139 (96.5)
High (>100)	12 (7.1)	4 (3.1)	13 (10.7)	4 (2.8)
$Respiratory rate*				
Low (<12)	nil	1 (0.8)	nil	nil
Normal (12-16)	32 (18.8)	15 (11.6)	14 (11.4)	60 (41.7)
High (>16)	138 (81.2)	113 (87.6)	109 (88.6)	84 (58.3)

Continued.

Type of college	Government		Private	
	Girls (n=171)	Boys (n=129)	Girls (n=123)	Boys (n=144)
Global PSQI*				
Non-poor sleeper (<5)	75 (43.9)	101 (78.3)	73 (59.3)	95 (66.0)
Poor sleeper (≥5)	96 (56.1)	28 (21.7)	50 (40.7)	49 (34.0)
Stress*				
Low stress (≤30)	15 (8.8)	15 (11.6)	11 (8.9)	15 (10.4)
Moderate stress (31–60)	144 (84.2)	103 (79.8)	90 (73.2)	99 (68.8)
High perceived stress (>60)	12 (7.0)	11 (8.5)	22 (17.9)	30 (20.8)
Anxiety*				
Low (≤21)	135 (78.9)	92 (71.3)	73 (59.3)	106 (73.6)
Moderate (22–35)	29 (17.0)	35 (27.1)	39 (31.7)	34 (23.6)
Potentially concern (>35)	7 (4.1)	2 (1.6)	11 (8.9)	4 (2.8)
^Depression*				
Normal (≤10)	22 (12.9)	34 (26.4)	23 (18.7)	36 (25.0)
Mild mood disturbance (11–16)	62 (36.3)	40 (31.0)	36 (29.3)	60 (41.7)
Border line (17–20)	36 (21.1)	23 (17.8)	20 (16.3)	19 (13.2)
Moderate (21–30)	48 (28.1)	25 (19.4)	31 (25.2)	21 (14.6)
Severe (31–40)	3 (1.8)	7 (5.4)	11 (8.9)	5 (3.5)
Extreme (>40)	nil	nil	2 (1.6)	3 (2.1)

Values are counts. Percentages in parenthesis; *p≤0.01; **p≤0.05; $ The hypothesis testing is conducted among the groups for Normal against the abnormal categories (Low/High); ^ The hypothesis testing is conducted by merging Severely and Extremely categories into one category.

Among students, 4.2% had potentially concerned anxiety, 24.2% had moderate and 71.6% had low levels of anxiousness. Anxiety levels had a significant association between boys and girls, at 10%. Anxiety levels were high in private college girls (Table 1). Moderate and potentially concerned anxiety was found in 28.4% of the students (Table 2). The mean anxiety scores were significantly higher in private college girls (Table 3). Girls from families with increased difficulty in solving problems were more anxious. The roles showed the patterns of behavioural issues of family members in the study population and their inability to fulfil the family functions had increased the moderate and potential concern anxiety levels among studied students. Inappropriate family functioning increases anxiety levels in students (Table 4). Poor quality of life indicators such as physical and psychological health, social relationships and environment were significantly high among the students with moderate anxiety levels. The proportion of poor family health indicators was significantly high in pupils with moderately low anxiety levels (Table 5).

Of 567 students, 5.5% suffered from higher (severe – 4.6% and extreme –0.9%), 22.0% from moderate, 17.3% from borderline levels of depression; 34.9% had mild mood disturbances and the remaining 20.3% were normal. Depression levels had a significant association between boys and girls at the 1% level.

Depression was less in private college boys (Table 1). Borderline and higher levels of depression were seen in 44.8% of students; depression was high in girls and government college students. The Chi-square test rejects the null hypothesis of homogeneity significantly between government and private college students for depression at the 5% level. The rejection test for homogeneity for depression levels between boys and girls occurred at the 1% level of significance (Table 2). The mean depression scores were significantly higher in private college girls (Table 3). Girls from families with increased difficulty in solving problems were more depressed. The roles showed the patterns of behavioural issues of family members in the study population and their inability to fulfil the family functions had increased the higher depression levels among studied students. The inability to express emotions and feelings among family members had increased depression levels of both genders. Lack of involvement of parents in children's activities had raised the depression levels of girls. Inappropriate action behaviours during needs and drives and social situations by family members increased the depression levels of boys. Inappropriate family functioning increased depression levels in students (Table 4). Poor quality of life indicators such as physical and psychological health, social relationships and environment were significantly high among the students with moderate depression levels. The proportion of poor family health indicators was significantly high in pupils with mild mood disturbance levels (Table 5).

Table 2: Distribution of the psychological morbidities against gender, type of college and quality of sleep.

	Gender		Type of college		Sleep quality		Total (n=567)
	Boys (n=273)	Girls (n=294)	Government (n=300)	Private (n=267)	Non-poor sleepers (n=344)	Poor sleepers (n=223)	
Stress			*		*		
Low	30 (11.0)	26 (8.8)	30 (10.0)	26 (9.7)	43 (12.5)	13 (5.8)	56 (9.9)
Moderate	202 (74.0)	234 (79.6)	247 (82.3)	189 (70.8)	269 (78.2)	167 (74.9)	436 (76.9)
High perceived	41 (15.0)	34 (11.6)	23 (7.7)	52 (19.5)	32 (9.3)	43 (19.3)	75 (13.2)
Anxiety					*		
Low	198 (72.5)	208 (70.7)	227 (75.7)	179 (67.0)	273 (79.4)	133 (59.6)	406 (71.6)
Moderate	69 (25.3)	68 (23.1)	64 (21.3)	73 (27.3)	64 (18.6)	73 (32.7)	137 (24.2)
Potentially concern	6 (2.2)	18 (6.1)	9 (3.0)	15 (5.6)	7 (2.0)	17 (7.6)	24 (4.2)
Depression^	*		**		*		
Normal	70 (25.6)	45 (15.3)	56 (18.7)	59 (22.1)	91 (26.5)	24 (10.8)	115 (20.3)
Mild mood disturbance	100 (36.6)	98 (33.3)	102 (34.0)	96 (36.0)	129 (37.5)	69 (30.9)	198 (34.9)
Border line	42 (15.4)	56 (19.0)	59 (19.7)	39 (14.6)	52 (15.1)	46 (20.6)	98 (17.3)
Moderately depressed	46 (16.8)	79 (26.9)	73 (24.3)	52 (19.5)	62 (18.0)	63 (28.3)	125 (22.0)
Severely depressed	12 (4.4)	14 (4.8)	10 (3.3)	16 (6.0)	9 (2.6)	17 (7.6)	26 (4.6)
Extremely depressed	3 (1.1)	2 (0.7)	nil	5 (1.9)	1 (0.3)	4 (1.8)	5 (0.9)

Values are counts. Percentages in parenthesis; *p≤0.01; **p≤0.05; ^The hypothesis testing is conducted by merging severely and extremely categories into one category.

Table 3: Mean distribution of psychological morbidity scaling parameters and its determinants.

	Government		Private	
	Girls (n=171)	Boys (n=129)	Girls (n=123)	Boys (n=144)
Stress score (0–90)*	44.850.82 [a]	44.191.02 [a]	48.96±1.25 [b]	48.87±1.12 [b]
Anxiety score (0–63)*	16.50±0.63 [a]	16.48±0.75 [a]	20.19±0.88 [b]	16.92±0.72 [a]
Depression score (0–63)*	17.26±0.49 [a]	15.82±0.68 [a]	18.13±0.83 [b]	15.27±0.68 [a]
PSQI (0–21)				
Global score*	6.12±0.21 [a]	4.40±0.20 [b]	5.14±0.28 [c]	4.72±0.20 [b, c]
WHOQOL domains (0–100)				
Physical health	69.03±0.89	69.72±1.11	67.41±1.26	70.58±1.06
Psychological	60.54±1.20	59.71±1.52	58.28±1.52	62.08±1.15
Social relationship	61.34±1.19	64.29±1.67	64.73±1.68	65.24±1.68
Environment*	63.51±1.14 [a]	59.18±1.43 [b]	65.91±1.33 [a]	62.53±1.16 [a, b]
FAD Scales (1–4)				
Problem solving*	1.84±0.03 [a]	2.03±0.04 [b]	1.80±0.04 [a]	1.90±0.03 [a, b]

Continued.

	Government		Private	
	Girls (n=171)	Boys (n=129)	Girls (n=123)	Boys (n=144)
Communication*	2.26±0.03 [a]	2.38±0.03 [b]	2.24±0.04 [a]	2.39±0.03 [b]
Roles*	2.23±0.03 [a]	2.39±0.04 [b]	2.21±0.04 [a]	2.36±0.03 [b]
Affective response*	2.14±0.04 [a, b]	2.27±0.04 [b]	2.03±0.05 [a]	2.18±0.04 [b]
Affective involvement*	2.20±0.03 [a]	2.36±0.04 [b]	2.05±0.04 [c]	2.20±0.04 [a]
Behaviour control*	1.94±0.04 [a, b]	2.01±0.03 [b]	1.94±0.03 [a, b]	1.84±0.03 [a]
General functioning*	1.97±0.03 [a]	2.26±0.03 [b]	1.91±0.04 [a]	2.09±0.03 [c]

Values are mean±SE; *p≤0.01. Means bearing similar superscripts do not differ significantly; One-way ANOVA has been conducted for testing the significance difference between the groups and Tukey HSD has been conducted for testing pairwise difference; The Global PSQI ranges between 0 (no difficulty) to 21 (severe difficulties in all areas). FAD Scales usually between 1 (Healthy) to 4 (Unhealthy).

Table 4: Mean distribution of determinants at each level of psychological morbidities for each gender.

Determinants	Gender	Stress levels			Anxiety levels			Depression levels				
		Low (n=56) mean (SD)	Moderate (n=436)	High perceived (n=75)	Low (n=406)	Moderate (n=137)	Potential concern (n=24)	Normal (n=115)	Mild mood disturbance (n=198)	Border line (n=98)	Moderate (n=125)	High^ (n=31)
Global PSQI score	Boys	3.50±2.22	4.52±2.25	5.59±2.17*	4.17±0.14	5.64±0.32	5.50±0.85*	3.61±2.05	4.36±2.25	5.17±2.02	5.37±2.03	6.27±3.03*
	Girls	4.23±2.93	5.63±2.77	7.38±3.46*	5.13±0.19	6.84±0.36	8.11±0.71*	3.73±2.59	5.48±2.46	5.55±2.51	6.52±3.14	9.19±2.95*
WHOQOL domains (4–20)												
Physical health	Boys	16.70±1.59	15.41±1.83	14.34±2.19*	15.82±0.12	14.34±0.24	13.62±1.09*	16.64±1.57	15.40±1.82	14.80±1.63	14.62±1.88	13.61±2.25*
	Girls	17.10±1.84	15.05±1.84	13.70±1.83*	15.44±0.13	14.30±0.19	13.81±0.63*	16.70±1.84	15.32±1.65	14.96±1.44	14.39±2.06	12.79±1.77*
Psychological	Boys	15.89±2.44	13.93±2.23	12.33±2.55*	14.47±0.16	12.50±0.26	11.33±1.15*	15.36±2.34	14.19±2.06	12.98±2.07	12.94±2.13	10.68±2.48*
	Girls	15.77±2.10	13.75±2.46	11.43±2.40*	14.04±0.18	13.11±0.27	11.44±0.81*	15.53±2.44	14.15±2.09	13.56±2.22	12.49±2.51	11.58±3.59*
Social relationship	Boys	15.22±3.14	14.65±2.97	12.76±3.17*	14.83±0.22	13.30±0.37	14.22±0.74*	15.53±2.91	14.70±2.78	14.13±2.61	12.91±3.39	12.98±3.95*
	Girls	16.36±2.49	14.09±2.57	13.04±2.99*	14.25±0.19	14.05±0.33	13.67±0.71	15.66±2.74	14.53±2.49	14.06±1.84	13.22±2.83	12.83±3.61*
Environment	Boys	15.47±2.49	13.73±2.24	12.36±2.27*	14.12±0.16	12.65±0.30	12.58±0.78*	14.86±2.51	14.00±2.18	13.15±2.09	12.54±1.90	11.60±2.24*
	Girls	16.39±1.89	14.30±2.24	12.35±2.37*	14.48±0.17	13.82±0.24	13.28±0.48**	15.89±2.19	14.58±2.18	13.47±2.23	13.81±2.31	12.59±2.59**
FAD scales												
Problem solving	Boys	1.89±0.45	1.97±0.41	1.97±0.49	1.94±0.03	2.06±0.06	1.84±0.11	1.89±0.44	1.94±0.38	2.08±0.38	1.99±0.46	2.07±0.65
	Girls	1.74±0.35	1.81±0.43	1.96±0.54	1.79±0.03	1.87±0.06	2.04±0.12**	1.64±0.37	1.78±0.38	1.88±0.47	1.88±0.45	2.18±0.57*
Communication	Boys	2.20±0.37	2.40±0.35	2.45±0.48**	2.31±0.03	2.55±0.04	2.72±0.11*	2.21±0.33	2.39±0.39	2.45±0.31	2.51±0.38	2.58±0.38*
	Girls	2.03±0.44	2.24±0.40	2.48±0.56*	2.21±0.03	2.31±0.05	2.49±0.12**	2.01±0.43	2.23±0.37	2.34±0.42	2.28±0.41	2.63±0.61*
Roles	Boys	2.18±0.39	2.39±0.37	2.45±0.32*	2.33±0.03	2.51±0.04	2.42±0.10*	2.28±0.39	2.31±0.38	2.42±0.27	2.57±0.35	2.47±0.35*
	Girls	1.87±0.35	2.23±0.38	2.42±0.42*	2.17±0.03	2.30±0.05	2.48±0.09*	2.02±0.42	2.17±0.38	2.28±0.36	2.33±0.39	2.38±0.44*
Affective response	Boys	2.16±0.44	2.21±0.43	2.36±0.62	2.19±0.03	2.33±0.06	2.11±0.15	2.06±0.42	2.26±0.46	2.21±0.39	2.31±0.47	2.54±0.63*
	Girls	1.92±0.53	2.07±0.48	2.38±0.68*	2.06±0.03	2.14±0.06	2.31±0.15	1.86±0.50	2.02±0.42	2.18±0.53	2.20±0.51	2.40±0.78*

Continued.

Determinants	Gender	Stress levels			Anxiety levels			Depression levels				
		Low (n=56) mean (SD)	Moderate (n=436)	High perceived (n=75)	Low (n=406)	Moderate (n=137)	Potential concern (n=24)	Normal (n=115)	Mild mood disturbance (n=198)	Border line (n=98)	Moderate (n=125)	High^ (n=31)
Affective involvement	Boys	2.24±0.42	2.29±0.46	2.24±0.41	2.25±0.03	2.35±0.05	2.05±0.17	2.21±0.51	2.27±0.40	2.29±0.45	2.34±0.45	2.33±0.47
	Girls	1.93±0.38	2.15±0.41	2.21±0.48**	2.12±0.03	2.17±0.05	2.30±0.08	1.98±0.38	2.14±0.43	2.17±0.36	2.17±0.45	2.31±0.48**
Behaviour control	Boys	1.79±0.28	1.95±0.39	1.88±0.46	1.89±0.03	2.01±0.05	1.74±0.13	1.89±0.41	1.85±0.37	2.04±0.37	1.93±0.37	2.13±0.46**
	Girls	1.93±0.49	1.94±0.43	1.95±0.45	1.96±0.03	1.90±0.06	1.85±0.07	1.99±0.42	1.96±0.43	1.93±0.46	1.89±0.44	1.97±0.49
General functioning	Boys	1.97±0.41	2.20±0.36	2.18±0.48**	2.12±0.03	2.31±0.04	2.13±0.14*	2.07±0.41	2.15±0.36	2.26±0.33	2.21±0.39	2.39±0.50*
	Girls	1.61±0.36	1.94±0.39	2.21±0.56*	1.89±0.03	2.05±0.06	2.20±0.12*	1.70±0.40	1.86±0.35	2.04±0.41	2.04±0.43	2.38±0.55*

Values are mean±SD; *p≤0.01; **p≤0.05. ^Severely or extremely depressed.

Table 5: Mean distribution of quality of life and family health by psychological comorbidities.

Parameters	N	Stress levels			Anxiety levels			Depression levels				
		Low (n=56)	Moderate (n=436)	High perceived (n=75)	Low (n=406)	Moderate (n=137)	Potential concern (n=24)	Normal (n=115)	Mild mood disturbance (n=198)	Border line (n=98)	Moderate (n=125)	High^ (n=31)
Poor quality of life												
Physical health	111	2(1.8)	77(69.4)	32(28.8)*	57(51.4)	46(41.4)	8(7.2)*	4(3.6)	30(27.0)	19(17.1)	38(34.2)	20(18.0)*
Psychological	271	10(3.7)	204(75.3)	57(21.0)*	160(59.0)	92(33.9)	19(7.0)*	21(7.7)	84(31.0)	52(19.2)	88(32.5)	26(9.6)*
Social relationship	224	13(5.8)	167(74.6)	44(19.6)*	149(66.5)	65(29.0)	10(4.5)	27(12.1)	63(28.1)	44(19.6)	74(33.0)	16(7.1)*
Environment	227	6(2.6)	169(74.4)	52(22.9)*	141(62.1)	73(32.2)	13(5.7)*	23(10.1)	64(28.2)	50(22.0)	68(30.0)	22(9.7)*
Poor family health												
Problem solving	179	12(6.7)	136(76.0)	31(17.3)**	117(65.4)	55(30.7)	7(3.9)**	23(12.8)	58(32.4)	39(21.8)	43(24.0)	16(8.9)*
Communication	408	32(7.8)	319(78.2)	57(14.0)**	278(68.1)	110(27.0)	20(4.9)**	64(15.7)	148(36.3)	76(18.6)	95(23.3)	25(6.1)*
Roles	415	27(6.5)	327(78.8)	61(14.7)*	282(68.0)	115(27.7)	18(4.3)*	75(18.1)	135(32.5)	78(18.8)	104(25.1)	23(5.5)*
Affective response	304	26(8.6)	229(75.3)	49(16.1)	206(67.8)	84(27.6)	14(4.6)	47(15.5)	101(33.2)	53(17.4)	80(26.3)	23(7.6)*
Affective involvement	343	30(8.7)	269(78.4)	44(12.8)	240(70.0)	89(25.9)	14(4.1)	61(17.8)	122(35.6)	63(18.4)	77(22.4)	20(5.8)
Behaviour control	211	15(7.1)	167(79.1)	29(13.7)	151(71.6)	54(25.6)	6(2.8)	43(20.4)	69(32.7)	42(19.9)	43(20.4)	14(6.6)
General functioning	294	17(5.8)	232(78.9)	45(15.3)*	195(66.3)	85(28.9)	14(4.8)**	45(15.3)	89(30.3)	64(21.8)	73(24.8)	23(7.8)*

Values are counts and percentages within the parenthesis; *p≤0.01; **p≤0.05; ^ Severely or extremely depressed categorized as highly depressed; Poor quality of life in each domain is defined as WHOQOL≤60; Poor family health in each FAD scale is defined as >2.00.

As per global PSQI scores, 39.3% of the students were poor sleepers (≥5); wherein 28.2% were boys and 49.7% were girls. In government and private colleges, respectively, 41.3% and 37.1% of students were poor sleepers. As the stress levels worsened, the average pulse rate increased in boys and poor sleepers (global PSQI score ≥5). Quality of sleep had decreased as the depression worsened from borderline to higher levels in boys and decreased even with mild mood disturbances in girls. Significant association was observed in stress, anxiety and depression levels among government and private college students at 1%, 10% and 5% levels, respectively. Further, the above levels were significantly associated between non-poor sleepers and poor sleepers at the 1% level. Girl students were poor sleepers (Table 1). Poor sleepers had more stress, anxiety and depression than non-poor sleepers. A significant rejection of the test for homogeneity for depression levels between non-poor sleepers and poor sleepers against psychological morbidities such as stress, anxiety, and depression occurred at the 1% level. (Table 2). The mean global PSQI score was higher in government college girls (Table 3). Poor sleeping amplified the psychological morbidities in girls. However, the levels were at an increased pace in boys (Table 4).

The environment domain average score was high in private college girls. On FAD scales, government college boys' response towards problem-solving was a bit unhealthy and boys showed unhealthier responses in 'communication and roles' than girls; Government college boys showed unhealthier responses towards affective response and involvement and general functioning in the family. The behaviour control scale was significantly different between the studied groups, but the average responses were healthy (Table 3).

DISCUSSION

A study by Deb et al, on 10th to 12th grade students in 400 private secondary schools (State Board) in Kolkata city, West Bengal showed that 42.5% and 35% of students had moderate and high stress levels, respectively.[13] Another cross-sectional study conducted by Raj and Kanagasabapathy at Kancheepuram town in 400 11th and 12th grade students revealed that 39% and 36% reported high and moderate levels of stress, respectively.[14] In both the above studies, the stress levels were higher in girls than boys; however, the difference was not significant. In the current study, the percentage of moderately stressed students was higher than in the above studies. Having constant stress leads to irreversible physiological changes in the body of the students due to the shift in the predominant sympathetic state of arousal. Due to this, the physiological responses needed to deal with the external stressors deteriorate due to the withdrawal of the para-sympathetic system. This will augment mental health and severe psychiatric disorders in students if the balance is not restored.[15-17]

Although stress affects every person irrespective of their demographic status, overcoming of the same mainly depends on the management of resources available to them. Here, psychological maturity plays an important role in defining the effects of stress. Individuals with less physical activity have more probability of experiencing the negative effects of stress. The adolescent age is highly vulnerable to several different stressful environments. The physical and psychological transitions such as in social roles from high school to higher secondary necessitate a lot of change and adjustment, which is highly stressful for students. Adolescents with high stress were found to have maladaptive and risky behaviours like inability to concentrate, fear of failure, negative evaluation of the future, poor eating and sleeping patterns, physical inactivity, anxiety, depression, increased alcohol and drug consumption, unprotected sexual activities, and suicidal tendencies.[18-21] Stress is defined as events in the environment or chronic conditions that objectively threaten the physical and/or psychological health and well-being of individuals of a particular age in a particular society.[22] Stress is being induced in adolescent students in the majority of schools and colleges in various forms such as vast syllabi, insufficient resources, congested lecture rooms, long study hours, parrot-fashion learning, academic grading and poor facilities.

Deb et al, revealed 30.0% and 37.1% of moderate and higher levels of anxiety in their study population, respectively.[13] About 54.7% of positive anxiety disorders were found among 201 adolescent students in pre-graduation Institutes at Mangaluru based study conducted by Jayashree et al.[23] In the current study, the anxiety levels were low compared to the above studies. The negative impact of stress and anxiety on the academic and social achievements of adolescents increases irritability & distractibility, exhibits signs of phobia, inability to problem-solve or more errors in performance, and poor academic accomplishments leading to school refusal.

The prevalence of depression (BDI≥17) among 818 9th to 12th grade students in Kerala was reported to be 17.4%.[24] The mean BDI score in 181 11th grade students was reported to be 13.4 in a Vellore-based study by Basker et al.[25] Mohanraj et al in 964 private school pupils studied 10th to 12th grade in Chennai found that 23.7% had moderate and higher levels of depression.[26] Russell et al stated the prevalence of depression (BDI≥18) in 181 students of 11th grade in southern India as 28.7%.[27] As per the study by Jayanthi et al, 612 students of 9th to 12th class at private higher secondary schools in Tiruvallur district, Tamil Nadu, had 19.6% severe, 45.7% moderate and 9.3% low depression levels.[28] The study conducted by Jha et at., (2017) on 1412 9th to 12th grade students in urban and rural areas of Patna, revealed that 49.2% of students were suffering from mild to severe levels of depression (23.4%–mild, 18.1%–moderate, 7.1%–severe).[29] In 2018, Jayashree et al, showed mild mood disturbances (23.9%), borderline clinical depression (17.4%), moderate (16.4%), severe (6%) and extreme (1%) depression levels.[23] In the

current study, 44.8% had borderline clinical and above levels of depression which are higher than the above studies except the study by Jayanthi et al.[28]

Singh et al study of 1812 school-going students 12-19 years at various schools of Delhi NCR and rural areas of Uttar Pradesh and Haryana revealed that adolescents with the absence of a relaxed family environment and amicable relationships among the family members were significantly suffered from depression.[5] Grover et al., (2019) stated that education-related issues, family-related issues, including relationships with parents and economic difficulties are the key risk factors for depression in adolescents.[30] In 13–19 years adolescent-based study by Skevington et al, emphasized that poor quality of life will elevate the symptoms of depression.[31]

A review by Shochat et al, demonstrated that inadequate sleep leads to poor somatic and psycho-social health, poor academic performance and risk-taking behaviours.[32] The sleep-related negative outcomes in adolescents may lead to more extensive long-term damage. Adolescents usually engage in unhealthy eating habits and insufficient sleep. These poor lifestyle behaviours envisaged depressive symptoms. The psychological changes in this age lead to intensified emotional experiences which may change the thoughts and concepts established and thus, influence their future character and personality, significantly.

In this age group, there will be unproductive coping methods and a significant lack of proper managing skills. The stress leads to anxiety, depression and finally sleeplessness. This may lead to poor quality of life, which can compromise their ability to handle their daily issues, and thus, have an impact on their academic performance. Often, girls experience higher levels of stress leading to psychological illnesses than boys due to their inability to share their feelings and fears among family members. Interestingly, students, particularly those studying intermediate at private institutions have fewer chances and improper recommendations for physical activity in this competitive world. Further, the quality of diet and lifestyles among many of them are poor. The high expectations of parents and teachers are reinforcing fears of failure and pressure to perform constantly in adolescents, which amplifies the academic stress, and a decrease in their confidence and interest in studies. Planning proper interventional strategies with an opportunity to give contemplation to the student's concerns and to clear their mind of any thought causing stress is required. Further, these strategies may improve student's behaviour and ability to focus on their education, as well as teachers' sense of well-being.

Limitations

This pilot study on psychological morbidities among pre-graduate students, conducted in select colleges of Tirupati and Chandragiri, has provided valuable insights. However, its limitations include a small sample size and a restricted geographical area, which may not represent the broader student population. To enhance the validity of the findings, a larger-scale study is recommended, encompassing a more diverse and extensive sample that can offer a more comprehensive understanding of the psychological health of pre-graduate students.

CONCLUSION

By understanding the risk factors of stress, anxiety, and depression in students and their impact on their education, sleeplessness, and quality of life, efficient management strategies can be developed. This management of such conditions should be at personal, institutional and social levels. Interventional strategies such as encouraging the adolescents to analyse the subjects; having regular physical activity; training them in enhancing their life skills, playing sports and games, practising yoga and meditation; and providing psychological and nutritional therapies – are effective measures in reducing psychological morbidities. The improvement of the holistic well-being of students will not only productive individually, but also improve the overall productivity of the young Nation.

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