

## Indian College Students Lifestyle Triad: Exploring Prevalence and Association among Stress Level, Dietary Habits and Exercise Patterns

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### Abstract

**Objective** -The present research focuses on the occurrence and correlation of stress, dieting and exercise among college going adolescents in Chennai, Tamil Nadu. **Methods** - A cross-sectional study adopting a descriptive research design was used in this study to involve 670 students aged 17-22 years (82% female) in four colleges. Perceived stressors (Perceived Stress Scale), dietary habits (Food Frequency Questionnaire) and levels of physical activity (International Physical Activity Questionnaire) were analyzed using standardized tools. **Results** - Scores revealed that stress was very prevalent with 47 percent of the students responded as that they were severely stressed, which was manifested through irritability, insomnia, and anxiety. Statistics showed high correlation levels; high amount of physical activity and healthy diets (fruits, vegetables, whole grains) had strong correlations with the lower stress levels, and low activity and poor dietary practices (a lot of sweets, fried foods, and processed foods) with the high levels of stress. The absence of academic pressure, motivation, and environmental factors, and strong social impacts were the key factors that prevented healthy behavior. Bidirectional relationship between stress and both lifestyle variables was also established through hypothesis testing and Pearson correlation. **Conclusion** -The results of the investigations demonstrate the high importance of concerted measures at campuses that help to maintain physical activity, proper nutrition, and stress-controlling mechanisms. It is also necessary to tackle these lifestyle factors in adolescence as a mitigation strategy against mental health risks as well as building long-term wellness practices. The research presents practical evidence that can inform an institutional policy and the general health initiatives aimed at enhancing the health of adult youths.

**Key Words** - Stress, Diet pattern, Physical activity, College students, Adolescents, Mental health

### 1. Introduction

The college transition is characterized by greater academic demands, social change, and life habits. These aspects cumulatively play a role in elevated stress among teenagers. Stress tends to be expressed in several unhealthy behaviors like inappropriate diet and less physical exercise. Adolescence period being a time for the development of life-long habits and recognizing how stress is related to dietary habits and physical exercise is crucial to their health and academic achievement.

#### 1.1. Stress among College Adolescents

The college students suffer from moderate to severe stress according to several previous studies and evidence. Causes may be academic pressure, social relations with peers, economic stress and worry regarding the future which result in chronic psychological stress and anxiety. Such stress may impair not only mental well-being but also academic achievement and social functioning, if left unattended. According to a study of city youth (ages ~13–19), 61.5% reported moderate-to-extremely severe stress, while only 2.7% had high physical activity. Such levels tend to escalate during university transitions as a result of academic pressures, lifestyle changes, and social stresses (1).

#### 1.2. Eating Habits and Stress

A consistent trend is seen as high stress relates to poor diet, including emotional eating and low healthy diet adherence. 434 undergrads (mean age ~21.7) were analyzed to categorize levels of stress: low (11.3%), moderate (72%), high (16.7%) (2). High stress was related to lower healthy eating index and higher emotional instability. A 2024 systematic review found that good diet quality was positively correlated with improved mental health in 36 of 45 studies, including decreases in stress and anxiety.

#### 1.3. Physical Activity and Stress

Physical activity is an established stress modulator. Physical activity (PA) always has an inverse relationship with lower stress in college students. Higher PA was strongly correlated with lower perceived stress and healthier diets in the same 434-student study (2). A 10-day diary and accelerometer study in exams in 90 students reported that both self-reported and light objective PA (e.g., walking) buffered stress by day's end. A cross-sectional sample of 1,396 undergraduates demonstrated a strong inverse correlation between PA, healthy lifestyle behaviors, and stress (particularly in women) (3).

#### 1.4. Interrelationship Between Stress, Diet, and Physical Activity

Current research indicates that diet and physical activity do not occur independently but rather interact to determine stress outcomes. Physical activity tends to induce changes in dietary choice and body composition for the better, which in turn promotes emotional stability. New research emphasizes the role of diet and PA in mediating stress outcomes. In a Chinese sample of 498 students, lifestyle and dietary nutrition mediated 24.9% of PA's influence on anxiety; combined mediation was 13.3% (4). A Pakistani study associated PA-related decreases in academic burnout with better diet and lower BMI, demonstrating diet and weight as mediators (5). Qualitative research indicates diet and stress management moderate the PA-mental health connection (6).

#### 1.5. Barriers to Healthy Habits

In spite of the advantages of healthy eating and physical exercise, most college students are confronted with barriers in the forms of time limitations, overload of studies, environmental constraints, and lack of motivation. Social forces, such as peer actions and culture, also have a very important effect on diet and physical activity choices. Resolving these barriers is critical in planning effective intervention. Barriers such as time pressure, environment, social context, and goal-setting habits significantly influence PA habits among students (7). Peer behavior also significantly influences adolescent diet and PA (8).

### 2. Research Objectives

- To study the prevalence of stress, causes, symptoms and coping strategies among college-going adolescents.
- To examine the relationship between food habits and levels of stress.
- To assess the association between physical activity and perceived stress.

### 3. Materials And Methods

#### 3.1. Research Design

Descriptive Cross sectional method was adopted to explore correlation between physical activities, diet and stress

#### 3.2. Locale

Locale was Chennai, Tamil Nadu, India.

#### 3.3. - Sampling Design

Random Sampling technique was used to conduct this study.

#### 3.4. Sample size

Sample size was N = 670 (M - 120 & F - 550) Adolescents (aged 17-22 yrs).

**3.5. Tools used**

**3.5.1. Physical Activities Inventory**

Adopted from The International Physical Activity Questionnaires (IPAQ), Youthrex Research and Evaluation eXchange. The Physical Activity Inventory measures the frequency, duration, and intensity of physical activities by individuals, usually for last 7 days.

**3.5.2. Cohen's Perceived Stress Scale (PSS)**

Cohen's Perceived Stress Scale (PSS), developed by Sheldon Cohen in 1983, is used to measure perceived stress. Self-report questionnaire (PSS-10), short version with 10 items, was employed to measure how unpredictable, uncontrollable, and overloaded respondents experience their lives. High scores indicate more perceived stress, using a 5-point Likert scale.

**3.5.3. Food - Frequency Questionnaire (FFQ)**

Adopted from, DAPA Measurement Toolkit, Medical Research Council, National Institute for Health Research, to determine usual dietary consumption over a specified period (typically weeks to months). It quantifies the frequency with which an individual eats particular foods or food groups, thus being suitable for nutritional epidemiology and public health research.

**3.6. Statistical Analysis**

Data were coded in Excel and then analyzed Chi Square (X<sup>2</sup>) and Pearson's correlation coefficient (r) using the Statistical Package for the Social Sciences (SPSS). Descriptive analyses were conducted to determine the patterns of college students' demographic information, stress level, dietary behaviors and physical activities with Correlation.

**4. Results and Discussion**

**4.1. Demographic Analysis**

**Table - 1- Demographic Analysis (N = 670)**

S No	Variable	Item	F (N= 670)	Percentage
1	Age	17-20 Yrs	567	84.62
		20-22 Yrs	103	15.37
2	Gender	M	120	17.91
		F	550	82.08
3	Education	College Level		
		UG	523	78.05
		PG	147	21.94

670 valid answers were used in this study after 48 unfinished questionnaires were removed from the originally selected 718 teenagers. The participants were recruited from four colleges in Chennai, TN, India. The age group indicates that most of the participants (84.62%) were in the 17–20 years' category, followed by 15.37% who belonged to the 20–22 years category. With respect to gender, the sample was largely female (82.08%), and males were 17.91%. The level of education was college level (78.05%), followed by undergraduates (UG) at 21.94%.

**4.2. Perceived Stress among Adolescents**

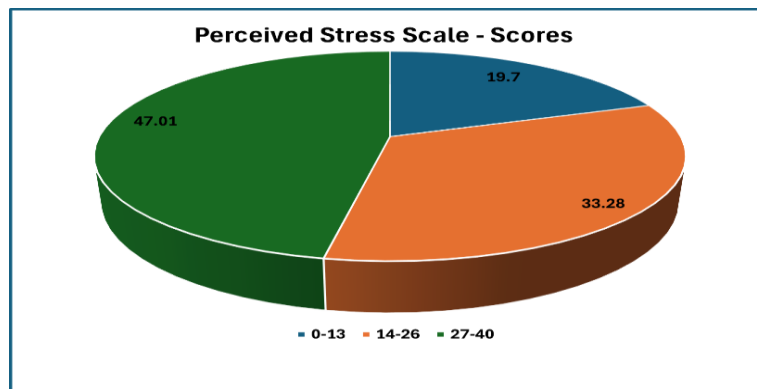
**Table - 2 - Perceived Stress Scale - Scores and Levels**

S No	Scores	f (N= 670)	%	M + SD	Interpretation
1	0-13	132	19.70	7.8 +2.3	Low Stress
2	14-26	223	33.28	21.7 + 6.0	Moderate Stress
3	27-40	315	47.01	34.06 + 5.2	High Stress

**Reference Values**

Individual scores on the PSS can range from 0 to 40 with higher scores indicating higher perceived stress.

- Scores ranging from 0-13 would be considered low stress.
- Scores ranging from 14-26 would be considered moderate stress.
- Scores ranging from 27-40 would be considered high perceived stress.



**Figure - 1 - Perceived Stress Scale - Scores and Levels**

There would be a significant difference in the distribution of the levels of stress (low, moderate, high) as compared to how it would be distributed randomly. The majority of the participants are highly stressed (p-value = 5.2410<sup>-17</sup> (very significant)).

Perceived stress was also measured using Perceived Stress Scale (PSS-10) developed by Cohen et al. (1983) which is a scale that measures how individuals perceive incidents in their lives as stressful. The scale score is between 0 and 40 with high scores indicating perceptions of greater stress. The participants were split into low (0-13), moderate (14-26), and high stress (27-40) categories according to predetermined cut-offs (9).

The percentage of people who were found to be experiencing high levels of stress in the present study were quite high (N = 670). Precisely, 47.01 percent (n=315) fell under the high stress category and they had a mean of 34.06 with a standard deviation of 5.2. The middle stress was measured

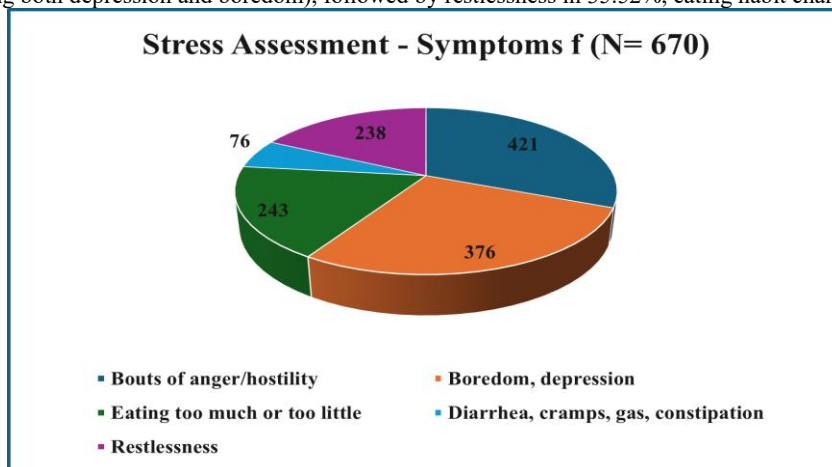
among 33.28% (n = 223) of the respondents (M = 21.7 ± 6.0), and only 19.7% of respondents were categorized in the low stress group (M = 7.8 ± 2.3). These findings are consistent with other studies that report the high levels of stress amongst the college students and youthful adults. Academic stress, lifestyle, and psychosocial concerns were some of the significant contributors to high rates of stress among this group (10) (11). The existence of high rates of stressed students in the present study testifies to the fact that appropriate mental health intervention and support mechanisms in the campus are needed.

**4.3. Stress Symptoms Assessment**

**Table- 3 -Stress Assessment - Symptoms**

S NO.	Symptoms	f (N= 670)	%
1	Headache	402	60.00
2	Tense muscles, sore neck and back	207	30.89
3	Fatigue	120	17.91
4	Anxiety, worry, phobia	409	61.04
5	Difficulty falling asleep/disturb sleep	509***	75.97***
6	Irritability	650*	97.01*
7	Insomnia	567**	84.62**
8	Bouts of anger/hostility	421	62.83
9	Boredom, depression	376	56.11
10	Eating too much or too little	243	36.26
11	Diarrhea, cramps, gas, constipation	76	11.34
12	Restlessness	238	35.52

The p-value is zero, indicating a highly significant difference from equal distribution. The symptoms are not similar in their occurrence. The symptoms are overwhelming (irritability, insomnia, difficulty sleeping), whereas some are far less frequent (fatigue, diarrhea, cramps). Stress may be expressed on different symptoms, which are physical, emotional and behavioural in nature, which were measured in an existing symptom list, by the current study. The most common symptoms of stress included irritability (97.01%), insomnia (84.62%), and difficulty falling or staying asleep (75.97%) in the analysis of 670 Total participants. The most recorded symptoms that the patients suffer often were anxiety, feeling of fear or phobia (61.04%), headache (60%) and outbreaks of anger or hostility (62.83%). At an emotional level, 56.11% of participants reported mood changes (encompassing both depression and boredom), followed by restlessness in 35.52%, eating habit changes in 36.26%.



**Figure - 2 - Stress Assessment - Symptoms**

Findings such as these complement research showing that psychological stress, in general but especially in adolescents and young adults, often is associated with an elevation of emotional reactivity and bodily complaints (12) (13). Increased levels of sleep disruption and irritability among this sample mirror the observed results (14) as chronic stress related with reduced sleep quality and susceptibility to developing mood disorders. Headaches and muscle tension, both experienced by a large proportion of our sample, are typically the bodily manifestations of stress (15). These many concomitant stress indicators underscore the urgent importance of mediating interventions and stress management programs, mental health promotion efforts, and resilience promoting practices within academic settings, particularly among children and university students who are experiencing academic and social pressures.

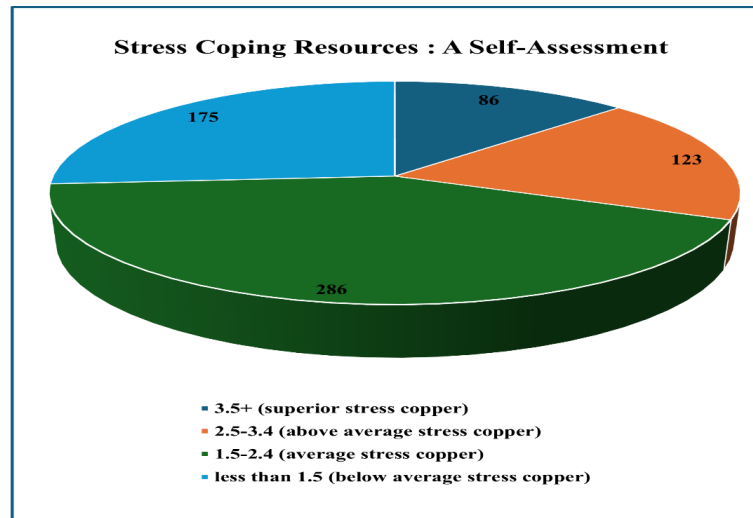
**4.4. Coping with Stress**

**Table - 4 - Stress Coping Resources Inventory: a Self-Assessment - Scores**

S No	Scores	f (N= 670)	%	Interpretation
1	3.5+	86	12.83	superior stress coper
2	2.5-3.4	123	18.35	above average stress coper
3	1.5-2.4	286	42.68	average stress coper
4	less than 1.5	175	26.11	below average stress coper

**Interpretation**

- An overall score of 3.5+ - a superior stress coper.
- An overall score of 2.5-3.4 - an above average stress coper.
- An overall score of 1.5-2.4 - an average stress coper.
- An overall score of less than 1.5 suggests - a below average stress coper.



**Figure - 3 - Stress Coping Resources Inventory: A Self-Assessment - Scores**

The observed distribution of coping scores differs highly significantly from an equal (random) distribution ( $p$ -value  $3.28 \times 10^{-29}$  (extremely significant)). Most participants are classified as average stress copers (43%), with relatively few in the superior (13%) or above average (18%) groups. The distribution is skewed toward the middle and lower categories, suggesting a need for interventions to build resilience and coping strategies among the population. Stress Coping Resources Inventory gives an indication of how well individuals are coping with stress using a 4-point self-evaluation scale. Out of 670 participants in this study, a high percentage (42.68%) fell in the average coping category (1.5 -- 2.4 scores) and 26.11% were categorized as below average stress copers with less than 1.5 scores. Only 18.35% of the participants exhibited above average coping skills (2.5–3.4), and a minor percentage (12.83%) were labeled as superior stress copers (3.5 and higher). The results are in keeping with the general literature on variance in coping skills among young adults and college students, especially when confronted with academic and psychosocial stressors (16) (17). The dominance of below average or average coping scores indicates a possible deficit in adaptive coping in this population. Ineffective coping styles, like avoidance and emotional disengagement, have been associated with increased psychological distress and lowered well-being (18). In addition, research points out that optimal stress coping is a balance between emotion-focused and problem-focused strategies (19). The results of the study underscore the importance of stress management interventions which not only stress reduction but also stress development and strengthening of coping abilities like cognitive reframing, time management, and emotion regulation.

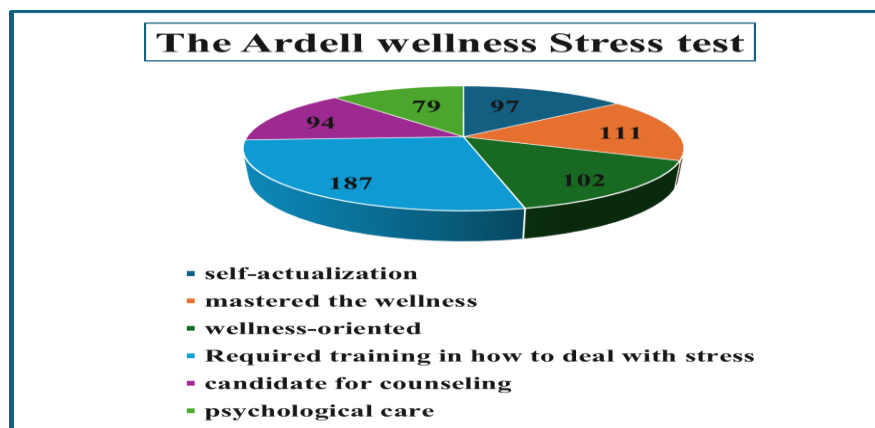
**4.5. Wellness Stress Assessment**

**Table- 5 - The Ardell wellness Stress test**

S No	Scores	f (N= 670)	%	Interpretation
1	+ 51 to + 75	97	14.47	self-actualization
2	+ 25 to + 50	111	16.56	mastered the wellness
3	+ 1 to + 24	102	15.22	wellness-oriented
4	0 to - 24	187	27.91	Required training in how to deal with stress
5	- 25 to - 50	94	14.02	candidate for counseling
6	- 51 to - 75	79	11.79	psychological care

**Ardell Wellness Stress Test Interpretation**

- + 51 to + 75 -self-actualized person, nearly immune from the ravages of stress. There are few, if any, challenges likely to untrack you from a sense of near total well-being.
- + 25 to + 50 - mastered the wellness approach to life and have the capacity to deal creatively and efficiently with events and circumstances.
- + 1 to + 24 - wellness-oriented person, with an ability to prosper as a whole person, but you should give a bit more attention to optimal health concepts and skill building.
- 0 to - 24 - candidate for additional training in how to deal with stress. A sudden increase in potentially negative events and circumstances could cause a severe emotional setback.
- 25 to - 50 - candidate for counseling. You are either too pessimistic or have severe problems in dealing with stress.
- 51 to - 75 - candidate for major psychological care with virtually no capacity for coping with life's problems.



**Figure - 4 - The Ardell wellness Stress test**

The observed frequencies of wellness/stress levels differ highly significantly from what would be expected by chance (p-value:  $7.15 \times 10^{-13}$  (extremely significant)). The largest group is those requiring training in stress management (28%), while fewer are in the healthiest (self-actualization, 14%) and most at-risk (psychological care, 12%) categories. The skewness is not normal, and there are more individuals who require stress management and less who have mastered wellness or those who require psychological intervention.

The Ardell Wellness Stress Test evaluates the overall well-being by summing emotional, physical, intellectual and social factors into one wellness-related stress score. A significant number (27.91) out of the total population of 670, in the present study, had the span of 0 to -24, indicating that they may require being trained on stress management skills. Furthermore, 14.02% were also classified as counseling candidates (-25 to -50), and 11.79% were in the most severe range (-51 to -75), indicating probable necessity for extensive psychological intervention.

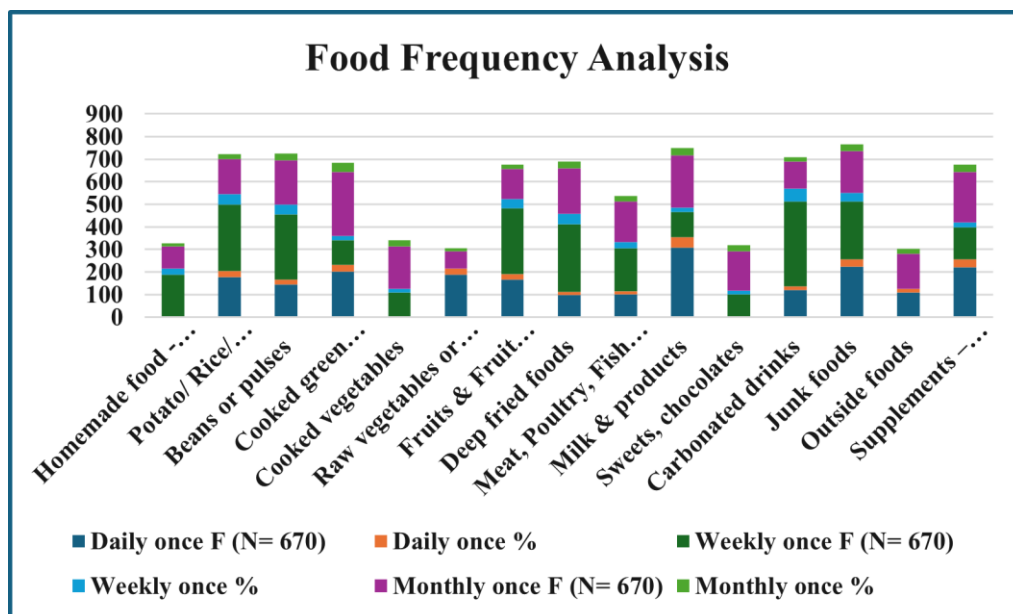
On the positive side, 14.47% of the participants scored between +51 to +75, placing them among self-actualized individuals who are almost stress-free. Another 16.56% reflected mastery of wellness (+25 to +50), and 15.22% were wellness-oriented individuals (+1 to +24), although they might benefit from some additional development in coping with stress.

These results corroborate the literature that highlights the fact that individuals with greater wellness involvement have lesser perceived stress and improved coping skills (20). The emphasis of the test on a wellness-oriented approach is also in line with the increasing literature that champions positive psychology and strength-based stress interventions (21). At the same time, the large proportion of participants in the lower score ranges highlights the continued need for institutional well-being programs, mental health literacy, and resilience training, especially in schools (22).

**4.6. Food Frequency Analysis**

**Table - 6 - Food Frequency Analysis**

S NC	LEVEL -----> Food Item	Daily once		Weekly once		Monthly once	
		F (N= 670)	%	F (N= 670)	%	F (N= 670)	%
1	Homemade food - Roti/ Rice/Bread with side dish	398**	59.40**	187	27.91	98	14.62
2	Potato/ Rice/ Maida pasta / noodles	178	26.56	295	44.02	156	23.28
3	Beans or pulses	145	21.64	289	43.13	197	29.40
4	Cooked green vegetables	201	30.00	111	16.56	284	42.38
5	Cooked vegetables	352***	52.53***	109	16.26	187	27.91
6	Raw vegetables or salad	187	27.91	360***	53.73***	78	11.64
7	Fruits & Fruit juice (NOT squash)	167	24.92	289	43.13	133	19.85
8	Deep fried foods	98	14.62	300	44.77	201	30.00
9	Meat, Poultry, Fish and Sea foods	100	14.92	189	28.20	179	26.71
10	Milk & products	309	46.11	112	16.71	232	34.62
11	Sweets, chocolates	401*	59.85*	101	15.07	176	26.26
12	Carbonated drinks	119	17.76	376	56.11	121	18.05
13	Junk foods	223	33.28	255	38.05	187	27.91
14	Outside foods	109	16.26	387**	57.76**	155	23.13
15	Supplements – health drinks or tablets	222	33.13	144	21.49	223	33.28



**Figure - 5 - Food Frequency (f)**

The food frequency data reveal that the consumption patterns of food items and intervals differ significantly (p-value:  $3.45 \times 10^{-296}$  (extremely significant)) between the intervals and food items, and hence the respondents have strong dietary preferences and habits. Analysis of 670 respondents through food frequency serves to emphasize the major trends in both the diet and the concerns of the nutrition of the adolescents. The vast majority of them answered that they ate homemade staple food products such as roti, rice, or bread with some accompaniments every day (59.40%), which was closely followed by the daily consumption of sweets and chocolates (59.85%) and cooked vegetables (52.53%). Interestingly

raw vegetable or salad was eaten on a weekly basis more often among over half of the sample (53.73) which suggests a more intermittent but regular emphasis to the consumption of raw food. The consumption of deep-fried food (44.77 and 38.05 per week) and junk food (38.05 and 57.76 per week) is also worrying as well as a high level of consumption of outside food (57.76 per week) and soda (56.11 per week) which has a high risk of obesity, cardiovascular diseases, and type 2 diabetes (23) (24). In spite of a relatively low daily intake of milk and milk products (46.11%), a relatively low intake of fruits (24.92%), green vegetables (30%), and pulses (21.64%) are indicative of an imbalanced and low-fiber and major micronutrient diet. These findings are consistent with international and Indian statistics on the inclination of adolescents to a Western food pattern, rich in refined carbohydrates, sugar, and fat, and poor in fresh fruit and vegetables, as well as whole grains (25) (26). This has been one of the causes of lifestyle disorders becoming premature such as stress that is also discussed elsewhere in this research.

Based on these trends, there should be specific nutritional education and intervention programs particularly in institutions in order to promote healthier eating patterns and avoid long term health expenditures among children.

**4.7. Physical Activity Analysis**

**Table - 7 (A)- Physical activity**

Question	Component	f (N= 670)	%
vigorous physical activities during the last 7 days	1-3 days	356***	53.05***
time spent on vigorous physical activities on one of those days	1-4 hr	403*	60.14*
moderate physical activities during the last 7 days	1-3 days	295	43.67
time spent on moderate activities on one of those days	1-4 hr	310	46.26
total days of walk for at least 10 minutes during the last 7 days	Daily	389**	58.05**
time spent on vigorous walking on one of those days	> 1 hr	297	44.32
time spent on sitting (long hours) during the last 7 days	4-6 days	298	44.47

The physical activity levels of 670 individuals give an indication of their activity with multiple intensity levels of movement during the previous seven days. More than half of the subjects (53.05%) indicated having done vigorous physical activity 1–3 times during the last week, while 60.14% had done so for 1–4 hours. Involvement in moderate physical activity was found to be somewhat lower, with 43.67% having done so 1–3 times a week and 46.26% having worked for 1–4 hours doing so.

Pleasantly, 58.05% of the participants answered that they walked every day for a minimum of 10 minutes, showing some stability in light-intensity physical activity. Still, the proportion of those who participated in vigorous walking for over an hour was quite high (44.32%), whereas 44.47% also indicated sitting for extended hours (4–6 days/week), revealing a sedentary behavior component even with physical activity attempts.

The findings align with the global concern on the levels of activity among adolescents and young adults that are likely to show occasional engagement in physical exercise and prolonged sedentary habits (27) (28). According to the recommendations of the World Health Organization (WHO, 2020), to receive meaningful benefits in health, adolescents have to gain at least 60 minutes of moderate to vigorous physical activities each day.

Extended sitting times are especially alarming since they are linked to higher risks of metabolic syndrome, cardiovascular disease, and mental disturbances (29). The combination of moderate activity with excessive sedentary time highlights the necessity for comprehensive wellness education emphasizing not just exercise but also interruptions of long sitting.

**Table - 7 (B)- Physical activity**

All the Study Group	n=670 (%)
<b>Level of PA during last 7 days</b>	
Low PA/time spent on sitting (long hours) during the last 7 days	298 (44.47)
Moderate PA	295 (43.67)
High (vigorous) PA	356 (53.05)
<b>Level of stress during last 7 days</b>	
Low (LLS)	277 (14)
Moderate (MLS)	118 (57)
High (HLS)	564 (29)

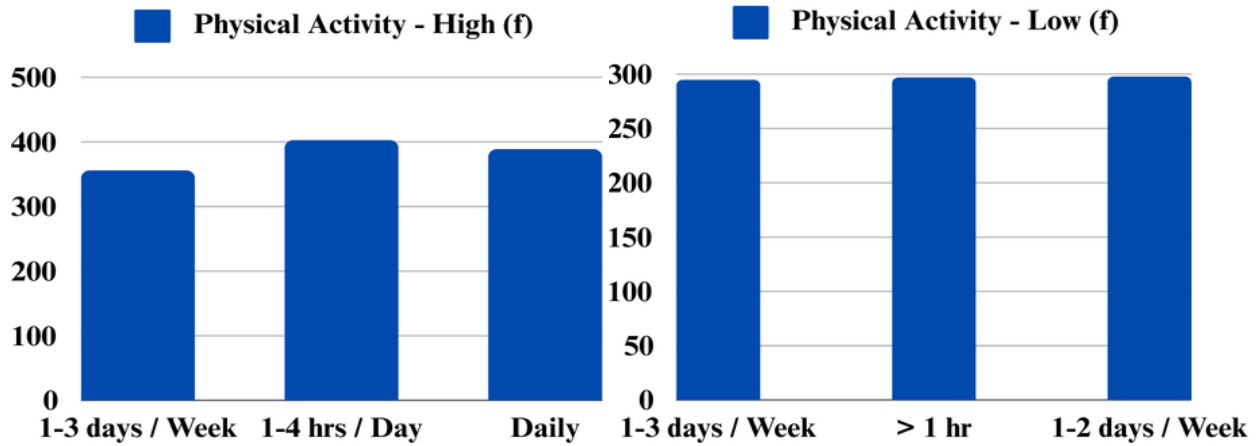


Figure - 6 - Physical Activity

The present study investigated the association between level of physical activity (PA) and perceived stress in 670 participants during the past 7 days. The results indicated that a considerable percentage of the participants had low physical activity, as 298 participants (44.47%) reported prolonged sitting or being sedentary. On the other hand, 295 participants (43.67%) had moderate PA, while 356 (53.05%) reported involvement in high or vigorous PA. In measuring stress levels, only 277 participants (14%) reported low stress (LLS), while a significant proportion had moderate (MLS) and high stress (HLS) levels, which were represented by 118 (57%) and 564 (29%) participants, respectively.

The fact that high physical activity occurred alongside relatively high stress levels indicates a compounded relationship. While greater PA is generally linked with less perceived stress (30), our findings indicate that high PA (53.05%) did not translate into a significant decrease in stress levels. This finding may be attributed to extraneous variables like workload, lifestyle habits, or inadequate recovery/sleep quality, which would cancel out the stress-reducing effects of physical activity (31).

In addition, the significant percentage of respondents with low PA (44.47%) corresponds with high stress rates (84.2% of respondents reporting moderate to high stress), further supporting the hypothesis that physical inactivity is likely to be a contributing factor to high stress rates (32). This finding also justifies the necessity to promote moderate and regular physical activity over mental health.

The findings indicate the necessity of tailored wellness programs that involve the promotion of physical activity among children and working adults alongside mental health intervention. Future studies should seek to investigate whether sleep, diet and screen time mediate the effects of PA-stress on a longitudinal study design.

Table - 8- Results Analysis

Scores					
S No	Stress	High Physical Activity	Low Physical Activity	Healthy Diet	Non- Healthy Diet
1	7.6	40.3	1.1	40.1	10.9
2	20	31	1.3	39.8	11.9
3	32.1	29.8	5.7	35.2	22.3

Table 8 represents the cross-sectional scores that prove the connection between the levels of stress, physical activity (PA), and dietary pattern in three score groups. The findings are very clear: the higher the stress levels are, the less healthy the physical activity levels are, and the higher the scores of unhealthy diets.

Participants had the highest high PA levels (40.3%), extremely low intake of unhealthy diets (10.9%), and greatly good diet intake (40.1%), in the lowest stress group (Score 1). This aligns with the past that shows that physical activity is negatively associated with stress levels and that, healthier eating patterns are likely to co-exist with better mental health (30).

Through contrast, the extreme stress group (Score 3) demonstrates a significant reduction in high PA (29.8%), significant rise in unhealthy diet (22.3%), and significant drop in the scores of healthy diets (35.2%). The trend is associated with a negative behavior change in response to psychological stress corroborated in the literature that states that stressed individuals tend to do more sedentary activities and eat more high-energy and nutrient-dense foods (33) (34).

The moderate stress category (Score 2) has mediocre values on all the variables and this further confirms the graded relationship between physical activity and diet quality and the degree of stress.

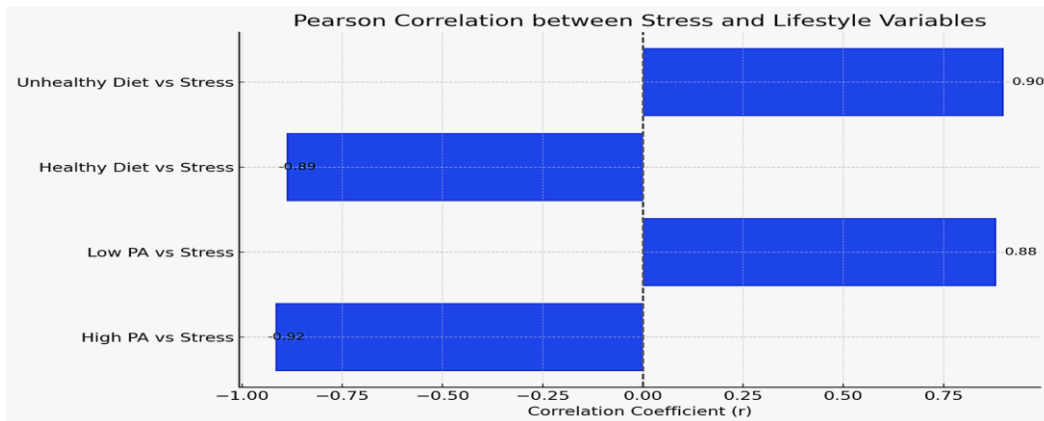
### 5. Interpretation

The opposite association between stress and high physical activity and healthy diet intake is, therefore, justified by the two-way interaction in that lifestyle behaviors are affected by stress and the reverse is also true. In particular:

- There was a decrease in healthy diet (40.1 to 35.2) and non-healthy diet (10.9 to 22.3) scores.
- Stress increased the low physical activity not as acutely as diet behavior.

**Table - 9- Pearson’s Correlation Table**

Pearson’s Correlation Table			
S No	Variables	Value Of Coefficient	Relation Between Variables
1	High Physical Activity V/S Stress	-0.91635	Strong Negative Association
2	Low Physical Activity V/S Stress	0.881297	Strong Positive Association
3	Healthy Diet V/S Stress	-0.88882	Strong Negative Association
4	Non- Healthy Diet V/S Stress	0.89984	Strong Positive Association



**Figure - 7 - Pearson Correlation Between Stress and Lifestyle Variables**

The Pearson's correlation coefficients in Table 1.8 give strong evidence of bidirectional relationships between levels of perceived stress and both physical activity and eating habits. The findings show statistically significant correlations in all combinations.

**Table - 10 - Result Interpretation**

S No.	Ho	Statement	Decision	Interpretation
1	Ho 1	No significant relation between high physical activity and stress level among adolescents	Pearson’s correlation coefficient (r) value is - 0.91635, so we reject the null hypothesis in favour of the alternative.	There is a strong negative association between high physical activity and stress level, meaning if we increase physical activities stress reduces.
2	Ho 2	No significant relation between low physical activity and stress level among adolescents	Pearson’s correlation coefficient (r) value is 0.881297, so we reject the null hypothesis in favour of the alternative.	there is a strong positive association between stress and low physical activity and stress level, meaning if we decrease physical activities stress increases.
3	Ho 3	No significant relation between healthy diet and stress level among adolescents	Pearson’s correlation coefficient (r) value is - 0.88882, so we reject the null hypothesis in favour of the alternative.	there is a strong negative association between high physical activity and stress level, meaning if we increase intake of healthy diet, stress reduces.
4	Ho 4	No significant relation between non - healthy diet and stress level among adolescents	Pearson’s correlation coefficient (r) value is 0.89984, so we reject the null hypothesis in favour of the alternative.	There is a strong positive association between unhealthy diet and stress level, meaning if we increase intake of unhealthy diet, stress increases slightly.

The study investigated the relationship between stress and two significant lifestyle factors that included physical activity and dietary practices in teenagers. The null hypotheses were tested using Pearson correlation analysis where four hypotheses were directed against a specific behavioral factor. Stress levels were strongly negatively correlated with physical activity. This shows that the level of stress in subjects who engage in vigorous or high-intensity physical exercise is dramatically reduced. The findings also follow what has been determined by numerous other studies that exercise represents an inherent stress-buffering effect owing to the alteration of neuroendocrine and neurotransmitter pathways (30). Physical exercise boosts stress resistance through the improvement of moods, reduction of anxiety, and regulation of cortisol. It has been established that the routine of moderate or vigorous exercise helps in overturning the physiological and psychological impacts of stress by balancing out the cortisol, promoting endorphin discharge, and enhancing wellness (30) (31).

**Table - 11 - Physical Activity and Role in Relieving Stress**

Type/Intensity of Activity	Role in Relieving Stress	Key Mechanisms	Source
Brisk walking (moderate)	Lowers cortisol, boosts endorphins, improves mood	Cardiorespiratory, endorphin release	<a href="#">Chekroud et al., 2018</a> ; <a href="#">WHO 2020</a>
Jogging/running (vigorous)	Rapid mood improvement, effective against anxiety	Endorphins, neurotrophic factor	<a href="#">Stults-Kolehmainen &amp; Sinha 2014</a>
Yoga (mild to moderate)	Reduces physiological arousal, calms mind, lowers anxiety	Parasympathetic activation, mindfulness	<a href="#">Gerber et al., 2013</a> ; <a href="#">APA 2020</a>
Swimming/cycling (moderate vigorous)	Combines aerobic and rhythm, enhances sleep and relaxation	Aerobic exercise, improved sleep	<a href="#">Kalmbach et al., 2018</a>
Strength training (moderate vigorous)	Increases resilience to stress, counteracts depression/anxiety	Endorphin release, increased self-efficacy	<a href="#">Chekroud et al., 2018</a>
Recreational sports/games (variable)	Promotes social interaction, social support, mood boost	Group engagement, distraction from stress	<a href="#">APA, 2020</a> ; <a href="#">Chekroud et al. 2018</a>
Dancing/aerobics (moderate vigorous)	Combines music, movement, creativity for major stress reduction	Dopamine, social engagement	<a href="#">WHO, 2020</a>

On the other hand, low physical activity is also very positively related to high stress. Sedentary living, especially among groups like students or white-collar workers, can contribute to physical as well as psychological exhaustion, further supporting perceived stress levels (32). This supports the notion that inactivity is a cause as well as effect of high stress. These results are consistent with previous work linking sedentary behavior with emotional dysregulation and mental distress (32).

A strong negative relationship is present between healthy intake of diet and stress. Fruitarian, vegetable, whole grain, and omega-3 fatty acid-rich diets have proven to have protective qualities against psychological stress by curbing systemic inflammation and improving gut-brain communication (34). Micronutrients like magnesium, vitamin B6, and antioxidants play a key role in managing stress and supporting good mental health. Foods rich in nutrients, such as leafy greens, fruits, whole grains, and sources of omega-3, have been shown to improve brain health, reduce systemic inflammation, and stabilize mood. These are essential for managing stress (34) (35).

**Table - 12 - Types of Foods and their Role in Relieving Stress**

Type of Food	Role in Relieving Stress	Key Components	Source
Leafy greens (spinach, kale, etc.)	Provide magnesium, which supports relaxation and reduces anxiety	Magnesium	<a href="#">Khaled et al., 2020; Jacka et al., 2017</a>
Fatty fish (salmon, sardines, mackerel)	Omega-3 fatty acids lower stress hormones, improve mood	Omega-3s (EPA/DHA)	<a href="#">Khaled et al., 2020</a>
Nuts and seeds (almonds, walnuts, pumpkin seeds)	Support serotonin production, supply magnesium/vitamins	Magnesium, Vitamin E, healthy fats	<a href="#">Torres &amp; Nowson, 2007</a>
Whole grains (brown rice, oats, quinoa)	Stabilize blood sugar, support neurotransmitter balance	Complex carbs, B vitamins	<a href="#">Ludwig, 2002; WHO, 2020</a>
Fermented foods (yogurt, kefir, kimchi)	Probiotics support gut-brain axis, lower anxiety	Probiotics, B vitamins	<a href="#">Jacka et al., 2017</a>
Dark chocolate	Boosts serotonin, contains antioxidants, may lower cortisol	Flavonoids, magnesium	<a href="#">Khaled et al., 2020; Ludwig, 2002</a>
Fresh fruits (berries, oranges, bananas)	Supply antioxidants, vitamin C, potassium for nerve function	Vitamin C, potassium	<a href="#">Jacka et al., 2017; WHO, 2020</a>
Herbal teas (chamomile, green tea)	Bioactive compounds relax mind, decrease anxiety and tension	L-theanine, flavonoids	<a href="#">APA, 2020; Kalmbach et al., 2018</a>
Dairy products (milk, yogurt, cheese)	Protein (tryptophan) aids serotonin, calcium supports nerve health	Tryptophan, calcium	<a href="#">Khaled et al., 2020; Jacka et al., 2017</a>

There is a strong link between unhealthy eating habits and stress. During stressful times, people often consume more high-energy, low-nutrient foods like sweets, fried snacks, and sugary drinks due to emotional eating and hunger issues. Research on stress-related eating behavior shows this trend (33). Diets like these not only fail to reduce stress but can make mental fatigue and emotional pain worse. This supports findings that identify emotional or stress eating as a temporary relief strategy, which usually leads to worsened mood and feelings of guilt or anxiety afterward (33). These findings emphasize the strong connection between psychological stress and lifestyle choices. Physical activity appears to lower stress, while being inactive and eating poorly tends to increase it.

### 1.5 Conclusion

This study firmly confirms that physical exercise and diet are statistically and clinically important predictors of adolescent stress. Encouraging active living and nutritionally adequate diets could be potent non-pharmacologic interventions to treat adolescent stress, especially in the school and urban environments.

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