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Inter relationship between diet and depression among adolescent males residing in urban areas.

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ABSTRACT:

BACKGROUND: In India, teenage malnourishment is becoming a growing public health issue. The WHO estimated that 20% of adolescents also struggle with mental health issues. There are a number of biological and behavioral reasons at play in the complex and varied association that exists between eating habits and depressive symptoms. This study aims to investigate the association between dietary habits and depression in urban adolescents in Telangana, India.

METHODLOGY: A cross-sectional study was conducted with 200 male adolescents aged 10-19 years, selected through multistage random sampling from local schools. A semi structured questionnaire was administered to collect demographic and socio-economic data initially, and then dietary behavior was assessed using self-reported eating habit questionnaire and 24-hour dietary recall. Depression among them was measured using the KADS, a self-report screening tool with 6-items.

RESULTS: The mean age of the participants was 16.7 years, and the mean BMI of the subjects was 23.2. AEHQ showed that 63% of the subjects were consuming higher than RDA of fats, sweets, and meats and 42% are consuming lower than recommended servings of vegetables and fruits. Those with poor diets had a mean KAD score of 6.12, indicating higher depressive symptoms, compared to 5.35 for those with almost adequate diets and 5.28 for those with good diets ($p < 0.0001$).

CONCLUSION: The results of this study highlight how crucial teenage eating habits are to the preservation of both physical and mental well-being. Improvements in nutrition and diet have the potential to be low-cost, acceptable, and safe therapies and treatments for adolescent depression.

KEYWORDS: Dietary habits, depression, adolescent boys, mental health, eating habits.

INTRODUCTION:

In recent decades, research has shown the negative impact of stress in adolescence, associating it with the presence of internalized or externalized symptomatology and with lower levels of life satisfaction. Along with the poor mental health, poor eating behaviors, inadequate physical activity, and obesity are some of the most pressing public health problems facing youth and adults.[1] Most of the studies have indicated that eating behaviors are linked to the BMI, nature of food, and psychological outcomes such as depression, anxiety, or body esteem. Depressed mood and anhedonia (loss of interest in daily activities) are two main symptoms of depression, and are mostly accompanied by other symptoms including change in weight or appetite, insomnia or hypersomnia, and worthlessness or guilt.[2]

Investigations showed that depression could decrease quality of life, and has reported as the most important cause of suicide in adolescents.[3] In addition, depression increases the risk of obesity, type 2 diabetes mellitus (T2DM), cardiovascular disease (CVD), and infertility. Recent evidence confirmed the bidirectional link between depression with obesity and T2DM. Recent evidence suggested that diet has an important association with mental health like depression, stress, and anxiety.[4]

Healthy eating patterns are related to better mental health and the effects of certain foods on metabolic systems can play a role in the association between food and mood. Adherence to the unhealthy dietary patterns, which are often high in red and processed meats, full-fat dairy products, saturated fatty acids and refined sugars, is directly associated with the risk of depression, low mood, and anxiety among adolescents, and adherence to the healthy dietary patterns can decrease the risk of depressive symptoms.[5] Dietary behaviors are considered important factors in mental health. Some unhealthy dietary behaviors like inadequate consumption of fruits, and vegetables as well as skipping meals are associated with feeling sad or hope- less, suicide ideation, and suicide attempts in adolescents.[6] Moreover, further strong value evidence has showed that avoiding processed foods and adherence to healthy diets can prevent depression. As a result, it is hypothesized that many unhealthy dietary behaviors are related to the risk of depression.[7] It seems further investigations are required to determine what extent unhealthy dietary behaviors are linked to the adolescent mental disorders. Accordingly, the present study was designed to investigate the relationship between depression and dietary behaviors in Iranian adolescent girls.

MATERIALS AND METHODS:

A cross sectional study was planned among 200 urban adolescents of Hyderabad city to understand the bi-directional association between dietary habits and depression. The sample size of 200 was calculated using the formula, $n=4pq/d^2$, where the prevalence of depression among adolescent boys (p=45.8%) was taken from a previous study conducted in Patna, Bihar, by Jha et al.,[8] and the sample size came to be 200. We employed multistage random sampling method to enrol the subjects into study, where schools were randomly selected from list of schools and then students from schools were selected randomly in the second phase.

After gathering the adolescents' baseline demographic information, the Eating Habits Questionnaire (EHQ) was used to gather information about their eating habits.[9] Adults and adolescents' eating characteristics are assessed using EHQ. It looks at three separate factors: knowledge of healthy eating (5 questions), challenges related to healthy eating (12 items),

and feeling favorably about healthy eating (4 items). It has 21 items that are answered on a 5-point Likert-type scale (1 being strongly disagree and 4 being strongly agree).

The KAD score was used to evaluate depression in each participant. In institutional settings, the 6-item KADS tool can be used as a screening tool to identify youth at risk for depression.[10] It can also be used by trained health care providers or educators to assess youth who are experiencing distress or who have been suspected of having a mental health issue. Following instructions from the health care practitioner, educator, or other responsible party, the young person is supposed to complete the KADS instrument, which is a self-report scale. A zero to three system is used to score the KADS, where "almost never" receives a zero and "always" receives a three. A total score of six or higher indicates "possible depression" and the necessity for a more comprehensive evaluation. "Probably not depressed" is indicated by a total score of less than 6. We just suggested that higher scores correspond to a higher risk for depression because there is no evidence for a diagnostic cut-off.

The collected data was analysed with IBM SPSS statistics software 20.0 Version. Descriptive data was analysed using frequency analysis and percentage analysis for categorical variables and mean & standard deviation for continuous variables. P value less than 0.05 was considered statistically significant.

RESULTS:

The study was conducted on 200 adolescent boys, and majority of them were between 14-16 years (44.5%), followed by 17-19 years of age. Most individuals follow a mixed diet (91%) and come from nuclear families (80.5%). Of these, 13% smoke and 17% consume alcohol. The study found that diet quality is significantly influenced by several factors. A higher percentage of vegetarians and individuals from joint or 3-generation families had better diets. Additionally, those with normal or underweight BMI were more likely to have good diets, while most overweight individuals had poor diets ($P<0.05$). Age, religion, lifestyle habits (like smoking and drinking), and socioeconomic status did not show significant associations with diet quality.

Table 1: Cross tabulation of Dietary behaviour with other variables in the study

Variable	Poor diet (n=102)	Almost adequate Diet (n=61)	Good diet (n=37)	p-Value
Age				
10-13 years	14 (34.5%)	15 (36.5%)	12 (29.2%)	0.059
14-16 years	47 (52.8%)	30 (33.7%)	12 (13.4%)	
17-19 years	41 (58.5%)	16 (22.8%)	13 (18.5%)	
Religion				
Hindu	87 (58.7%)	41 (22.8%)	20 (13.5%)	0.092
Muslim	12 (30.7%)	13 (33.3%)	14 (35.9%)	
Christian	3 (23.08%)	7 (53.8%)	3 (23.08%)	
Diet				
Vegetarian	4 (22.2%)	6 (33.3%)	8 (44.4%)	0.005*
Mixed	98 (53.8%)	55 (30.2%)	29 (15.9%)	

Family Type				0.001*
Nuclear	93 (57.7%)	45 (29.9%)	23 (14.2%)	
Joint	3 (37.5%)	2 (25%)	3 (37.5%)	
3-Generation	6 (19.3%)	14 (45.1%)	11 (35.4%)	
Habits				0.18
Smoking habit	12 (46.5%)	5 (19.2%)	9 (34.6%)	
Drinking Alcohol	22 (64.7%)	7 (20.5%)	5 (14.7%)	
BMI				0.000*
Underweight	8 (27.5%)	13 (44.8%)	8 (27.5%)	
Normal	41 (49.4%)	33 (39.7%)	9 (10.8%)	
Overweight	38 (73.08%)	13 (25%)	3 (5.7%)	
Obese	15 (41.6%)	2 (29.7%)	16 (11.7%)	
SES				0.08
Upper class	55 (58.5%)	28 (29.7%)	11 (11.7%)	
Upper Middle class	23 (53.4%)	12 (27.9%)	8 (18.6%)	
Middle class	14 (48.2%)	9 (31.03%)	6 (20.6%)	
Lower Middle class	7 (33.3%)	8 (38.1%)	6 (28.5%)	
Lower class	3 (23.08%)	4 (30.7%)	6 (46.5%)	

A significant number of participants report having a poor diet (51%), while 30.5% have an almost adequate diet and 18.5% maintain a good diet. This tells us that over half of the individuals were found to have not met optimal dietary standards. Participants were found to consume an average of 6.12 servings of cereals and energy-dense snacks, indicating a reliance on these food types. Vegetable intake averages 3.1 servings, while milk and milk products average 2.4 servings. In contrast, pulses and legumes (0.78 servings) and fruits (1.23 servings) are consumed less frequently. Non-vegetarian food products average 2.26 servings, and energy-dense beverages average 3.78 servings, reflecting a varied but potentially imbalanced diet across different food groups.

Table 2: Mean serves per day of different food groups

	Mean	**Standard Deviation**
Cereals	6.12	3.6
Pulses and Legumes	0.78	1.3
Vegetables	3.1	2.1
Fruits	1.23	3.2
Milk and milk products	2.4	2.4
Non-vegetarian food products	2.26	2.1
Energy-dense snacks	6.12	7.2
Energy-dense beverages	3.78	5.1

In the present study, KAD scores has shown a higher mean of 5.58 (SD=2.88), which represent a slightly higher score for depressive symptoms. Those with a poor diet have a mean KAD score of 6.12 (SD = 3.02), which is significantly higher than those with an almost adequate diet (mean = 5.35, SD = 2.37) and a good diet (mean = 5.28, SD = 2.56). The statistically significant p-value of 0.0001 indicates a meaningful difference in KAD scores, suggesting that dietary quality is associated with risk of depression among the adolescents.

Table 3: KAD scores in relation to the dietary behaviour

	KAD score		**p-value**
	Mean	**SD**	
Poor diet (n=102)	6.12	3.02	0.0001*
Almost adequate diet (n=61)	5.35	2.37	
Good diet (n=37)	5.28	2.56	
Total Mean	5.58	2.88	

DISCUSSION:

Our study explored the dietary intake of the male adolescents, as a lot more studies in India had focused on female dietary intake and mental health. Early in life, healthy eating is recommended as a component that could significantly affect mental health. [6] We discovered that food habits have gotten worse as people age. In contrast, other research conducted in India have found that education level improves dietary behaviour, however these investigations focused on adults.[11] Our study found no correlation between education level and improved dietary evaluation among women, contrary to an Indian study that found a correlation.

The idea that those with greater education base their decisions on dietary recommendations is a tenable explanation for the relationship between higher education and improved dietary intake.[12] According to Gibson-Smith et al., eating more vegetables was linked to lower levels of anxiety, despair, and dread.[13] Three eating patterns—snack, animal food, and traditional food—were identified by Weng et al.'s study, which used main component analysis and was conducted on both boys and girls. The snack diet included a lot of candy, preserved fruit, fried or organ meat, and processed meat. Among those study participants, the prevalence of comorbid conditions, depression, and anxiety was 12.6%, 14.6%, and 11.2%, respectively.[14] This result was consistent with our study, which indicated that people ate more meat than fruits and vegetables.

This study demonstrated the strong correlation between young people's depression and their diet of fruits and vegetables. While Glabska et al. contended that fresh fruits, green vegetables, and yellow vegetables were found to be particularly beneficial for the general mental health of teenagers, as were other fruits and vegetables[15], Dharmayani et al. emphasized that there is insufficient evidence regarding the effect of fruits and vegetables on lowering the risk of developing depression and depressive symptoms.[16]

Ju et al. also observed that a group that consumes more refined sugar and sweets and less fruit, vegetables, and legumes

is more likely to have depressive symptoms. After controlling for confounding variables (age and calorie intake), the model came to the same conclusion.[17] There is proof that vitamin D supplementation can help adolescents with depression, and the link between vitamin D deficiency and depression is also well-established.[18] Researchers in an Indian slum research found a high correlation between depression and food insecurity (odds ratio: 13.96).[19] A randomized controlled experiment was conducted by Jacka et al. with the goal of determining if a program of food improvement might effectively cure major depressive episodes. The patients who adhered to the adjusted food program saw a higher frequency of remission and a lower score for depressive symptoms at the conclusion of the 12-week intervention.[20]

CONCLUSION:

In relation to depression in adolescents, the current study highlights strong cross-sectional evidence linking healthy dietary practices—specifically, eating fewer than two servings of fruits per day—and unhealthy dietary behaviors, such as consuming fast food frequently (at least three days per week) and carbonated soft drinks daily. This serves as a reminder of the need for effective public health programs that prioritize mental health and promote healthy eating habits in adolescents. Furthermore, to further explore the relationship between nutrition and depression, we suggest conducting randomized controlled trials and prospective cohort studies.

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