

The Relationship Between Stress and Eating Behaviors among Turkish Adolescence

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Abstract: The study aims to investigate the effect of stress on body weight (BMI) and eating behaviors in a sample of 889 Turkish adolescents (14-25 ages). A “personal information form” was gathered information about adolescents and their families. The “types of coping with stress scale” were used to detect the stress level and the worries of adolescents. The “eating behavior scale” was prepared to collect information on their eating habits. The reliability and validity of the Eating Behavior Scale (EBS) developed by Şanlıer and Oğretir [13] were established. The study found that female adolescents underwent stress more than male adolescents. Also, there were statistically significant differences between females who perceived more need for social support, eating with positive and negative moods than males. The males scored higher on being optimists than females with a statistically significant result. If adolescents know their personality features, they can determine the degree of the prevention from stress. Also, they can link their ability to adapt themselves to environment and past experiences in parallel with the changes.

Key words: Stress • Eating behaviors • Adolescence • BMI • Weight • Turkey

INTRODUCTION

Attitudes and behaviors toward eating are shaped by multitudinal factors including psychological factors and stress. This article examines linkages between stress, eating attitudes and behaviors and body weight (BMI) among 889 Turkish adolescents aged 14-25. Several studies have implied there was a correlation between the stress levels and the formation of adolescents' eating attitudes and behaviors. The present study attempts to establish to what extent the stress factors contribute in shaping eating attitudes and body weight.

Psychological stress, a perceived challenge to well being, is an indispensable and influential part of life. Although stress-causing factors vary greatly from person to person and between the genders, physiological reactions of the human body against stress are quite similar to each other [1]. Physiological reactions such as high level blood pressure, ulcer, migraine, perspiring and fast-breathing cause psychological changes such as recession, anxiety, worry, accepting and depression as well [2]. Learn how to manage stress may provide ability for an individual to give appropriate and sufficient reactions against prolonged and extreme stress.

Adolescence is a critical period of life for both body weight and psychological stress. The researchers suggested that people of normal weight responds more internal stimuli such as physical hunger and obese persons give reaction to external stimuli such as psychological stress [3]. The body size of youngsters and their preoccupation with appearance may lead to a stressful life. Studies show that adolescents tend to more likely develop negative body image, disturbed eating behaviors and high levels of stress. Stress might increase the craving to eat in two ways, either directly or via its arousal-provoking properties. When individuals experience stressful events, they may more likely develop disordered eating attitudes and behaviors [4, 5]. The dietary habits plays an important role in coping with stress as well as neurological and psychiatric breakdowns. It has been stated that some food lead to increase stress reactions, making individuals much more sensitive towards stress [6].

Hudd *et al.* [7] studied whether stressed students are more inclined to bad eating behaviors than non-stressed students. Their study revealed that the students at high stress group were more generally eat unhealthy food than those at low stress group. Other studies indicated the established relationship among

high stress levels, lower self-esteem and unhealthy eating behaviors [8, 9].

A study by Fisher *et al.* [10] indicated there was a strong intercorrelations among low self esteem, high weight concerns, disordered eating behaviors and high anxiety for suburban female high school students.

It is difficult for people to change their eating habits. The most effective ways in coping with stress are eating in small amounts in slower manner and frequently, avoiding high-fat and high-sugar, caffeine and salt in food and not skipping meals. Besides, regular sleep and doing exercise have great benefits to deal with stress and disordered eating behaviors [11]. Those who exercise regularly and have adequate nutrition and healthy, well-balanced diets have lower pulse rate and lower blood pressure as a reaction in stress-creating situations than those who less exercise and have an unbalanced diet. For these reasons, taking exercise and having adequate and a balanced diet are an indispensable part in relaxation training [12].

This study was planned and carried out in order to examine the influence of stress on eating behavior and body weight with the application of Stress and Eating Behavior Scales on 889 Turkish adolescents aged 14-25 years. The present study attempts to answer four questions:

- Would there be differences in psychological stress between 14-18 and 19-25 years old adolescents?
- Would the stress for females differ from that of males?
- Is there any difference between the eating behaviors of females and males?
- Is there any effect of stress on the eating habits of adolescents at different age groups?

MATERIALS AND METHODS

Participants: The 889 adolescents who participated in the present study were 14 years to 25 years old. They were 554 females (62.3 %) and 335 males (37.7 %) most of whom attended high schools and universities located in urban community in Ankara. Students received information that the purpose of the study was to gather information about the effects of stress on body weight and eating behaviors. Each subject participated in a face-to-face interview lasting approximately 20 minutes. All the participants were volunteers to enroll in the study.

Instruments: During the interviews, participants provided their demographic information (age, education, etc.). The Eating Behavior Scale and Types of Coping with Stress Scale were developed by Sanlier and Ogretir [13]. The reliability and validity of the scales were tested for Turkish adolescents. The Cronbach's alpha levels remained with an acceptable range, with coefficients of 0.72 for the Types of Coping with Stress and 0.87 for the Eating Behavior Scales, respectively. The scales have 31 items and four main subscales: Eating in negative mood (13 items), eating in positive mood (8 items), determined into eating (6 items) and having weakness towards eating (4 items). Respondents answer each question on a 1-5 Likert-type self-report scale. Participants were requested to mark "never", "seldom", "sometimes", "usually" and "always". The "never" and "always" responses received a score of 2 and all of the other responses earned a score of 1.

Anthropometric measurements: The weights of all the subjects were measured with a bathroom scale to the nearest 0.1 kg. Heights were measured with the subjects standing barefoot with heels together, arms at the side, legs straight, shoulders relaxed and head in the Frankfort horizontal plane, with heels, buttocks, scapulae and back of the head flush against a vertical wall. The balance of body weight with height was evaluated with body mass index (BMI). BMI was calculated as weight (kg) divided by height (square meters) [weight (kg)/height (m²)] [14, 15]. A BMI below 18.5 kg/m² indicates unusual thinness. A BMI between 18.6 and 24.9 kg/m² is considered normal weight. A BMI of over 25.0 kg/m² indicates overweight or obese status [15]. All measurements were performed by two trained dietitians as recommended [14].

RESULTS

The average Body Mass Index (BMI), which signifies the proportion of body weight by height, of female adolescents in this sample was 23.2 kg/m². For the male participants, the BMI was 21.2 kg/m². The statistical results of sub-dimensions of stress and eating behaviors by gender are shown in Table 1.

When the participants were asked about sub-dimensions of stress, there were no statistically significant mean differences for having self-confidence between females ($M= 35.14 \pm 4.51$) and male participants (35.47 ± 5.06 ; $t = 0.988$, $p > .05$). On the other hand, the

Table 1: Means, standard deviations comparison of stress and eating behaviors by gender

Dimensions	Gender		t
	Male (n=554)	Female (n=335)	
Having self-confidence	35.47 (5.06)	35.14 (4.51)	0.988
Optimist	22.68 (4.56)	21.90 (3.99)	2.674
In need of social support	13.17 (2.53)	13.65 (2.05)	3.044*
Eating in negative mood	27.34 (11.57)	30.24 (12.26)	3.490*
Eating in positive mood	18.71 (6.59)	21.34 (7.36)	5.362*
Having determined behavior toward eating	19.76 (5.55)	20.56 (6.56)	1.851
Having weakness toward eating	10.07 (4.40)	10.02 (3.05)	0.197

* p <0.05

differences on the sub-dimension of “optimists” indicate a higher mean score for males ($M=22.69\pm 4.56$) than for females ($M=21.90\pm 3.99$) with a statistically significant result ($t=2.674$, $p<0.05$). In response to the question of need of social support, the ratings were higher for female subjects ($M=13.65\pm 2.05$) in comparison to male subjects ($M=13.18\pm 2.53$). The discrepancy between the genders has been found to be statistically significant ($t=3.044$, $p<0.05$).

The detailed statistical results of eating behaviors by gender indicated statistically significant results for eating in negative and positive mood. The participants were asked to rate their emotional eating behaviors in four sub-dimensions. The t-test clearly shows that there were statistically significant differences on eating in negative mood between female ($M=30.24\pm 12.26$) and male ($M=27.34\pm 11.57$) participants ($t=3.490$, $p<0.05$). The analysis of mean differences for eating in positive mood dimension indicates statistically significant results ($t=5.362$). The female ($M=21.34\pm 7.36$) participants scored higher on eating in positive mood than the male ($M=18.70\pm 6.59$) participants. The mean scores of having determined behavior towards eating indicated no significant differences between female ($M=20.56\pm 6.56$) and male ($M=19.76\pm 5.55$) participants ($t=1.851$, $p>0.05$). The discrepancy about having weakness toward eating between females ($M=10.02\pm 3.05$) and males ($M=10.07\pm 4.40$) is not statistically significant ($t=0.197$, $p>0.05$).

A 2 X 2 (Age X Gender) ANCOVA was implemented to analyze the effects of two age groups (14-18 and 19-25) and gender on stress and eating habits. The controlling variable is BMI that is divided into three categories: underweight, normal and overweight. The statistical results of ANCOVA indicated significant age differences in having self-confidence $F(1, 879) = 6.647$, $p<0.05$,

having an optimistic behavior $F(1, 879) = 49.439$, $p<0.01$, eating in positive mood $F(1, 879) = 39.518$, $p<0.01$ and having determined behavior toward eating $F(1, 879) = 70.775$, $p<0.01$. The 14-18 age groups perceived more self confidence ($M=35.88\pm 5.42$), more optimistic behavior ($M=23.58\pm 4.63$), more eating in positive mood ($M=21.50\pm 6.52$) and more determined behavior toward eating ($M=18.07\pm 6.10$) than the 19-25 age group ($M=34.85\pm 4.20$), ($M=21.29\pm 3.60$), ($M=19.64\pm 7.50$) and ($M=21.60\pm 5.91$), respectively. The gender main effect was statistically significant for in need of social support $F(1, 879) = 11.848$, $p<0.01$, eating in negative mood $F(1, 879) = 8.918$, $p<0.05$ and eating in positive mood $F(1, 879) = 36.373$, $p<0.01$. The female participants scored higher on in need of social support ($M=13.63\pm 2.04$), eating in negative mood ($M=30.15\pm 12.24$) and eating in positive mood ($M=21.38\pm 7.36$) than the male participants ($M=13.18\pm 2.53$), ($M=27.39\pm 11.58$) and ($M=18.66\pm 6.58$), respectively.

The interaction effect between Age X Gender was significant in having an optimistic behavior $F(1, 879) = 5.788$, $p<0.05$, in need of social support $F(1, 879) = 9.585$, $p<0.05$, eating in negative mood $F(1, 879) = 11.390$, $p<0.01$ and eating in positive mood $F(1, 879) = 10.840$, $p<0.01$. The 14-18 age group females had higher optimistic behavior ($M=23.74\pm 4.28$) than the 19-25 age group females ($M=20.94\pm 3.49$). The optimistic behavior for the 14-18 age group males is higher ($M=23.38\pm 5.04$) than the 19-25 age group males ($M=22.00\pm 3.72$). The 14-18 age group females perceived higher ($M=13.97\pm 2.34$) in need of social support than the 19-25 age group males ($M=13.46\pm 1.85$). The results for the male participants of the 14-18 age group ($M=12.93\pm 2.81$) is lower than the 19-25 age group ($M=13.39\pm 2.55$). In terms of comparison eating in negative mood, the 14-18 age group female ($M=28.39\pm 12.02$) had lower score than the 19-25 age group ($M=31.06\pm 10.73$). The 14-18 group males ($M=28.58\pm 12.43$) also had lower score than the 19-25 age group males ($M=26.38\pm 10.73$). The analyses of eating in positive mood indicated the 14-18 females ($M=22.16\pm 6.56$) had higher scores than the 19-25 age group females ($M=20.99\pm 7.72$). Similarly, the 14-18 age group males ($M=20.70\pm 6.40$) scored higher than the 19-25 age group males ($M=16.95\pm 6.24$).

DISCUSSION

In this study, female adolescents appear to experience stress more than male adolescents in terms of being need of social support and less optimistic.

The means of being in a need of social support and of being pessimistic were higher for female than male adolescents with a statistically significant result ($p < 0.05$). The means of emotional eating behaviors of female adolescents were higher than male adolescents ($p < 0.05$). There were significant differences between male and female adolescents in eating with positive and negative mood. Disturbed eating attitudes were more prevalent in females than males [16, 17]. Bas *et al.* [18] found that the prevalence of disturbed eating attitudes was higher among the Turkish late adolescents and that disturbed eating attitudes were related to several psychological characteristics.

The comparison of age groups revealed the 14-18 age group perceived less stress with more self-confidence and optimistic behavior than the 19-25 age group. Adolescents aged 19-25 are influenced from stress more than adolescents aged 14-18. The analysis of eating behaviors of 14-18 years old group indicated higher scores for eating positive mood and having determined behavior toward eating than the 19-25 age group. The results concluded that there was a significant relationship between emotions and eating behavior for 19-25 age group adolescents. The 14-18 years old group developed more positive attitude towards themselves and their emotions influenced less their eating behaviors. Sahin and Durak [19] found out in a study conducted among 573 university adolescents that there was a discrepancy in coping with stress between the genders in "in need of social support" sub scale and that female adolescents are more likely "need of social support" than male adolescents in stressful situations. In another survey, females are more influenced by stress than males [20]. According to a study, when women feel sad and distressed, their food intake increase 83 %. When they are happy and excited, an increase in percentage of food intake is 49.6%. Also, emotional condition of women may have a great influence on their body weight increase. Women who are distressed and sad have more likely higher Body Mass Index than women who has low stress levels [21].

When individuals feel tense and stressful, their unhappiness, eating disorders and lack of self confidence increase. In one study, depression, feeling bad, being worried, indigestion and being overweight were the symptoms of situational worries for women [22]. Koknel [23] interpret overeating and putting on weight as an escape from stress. In another study, it has been stated that overweight people have more depressive symptoms compared to control group consisting of healthy people and psychological symptoms accompanying obesity are

results rather than reasons [24]. Further analysis examined underweight, normal and overweight subjects. Stress factor was a significant differentiating factor among three types of subject.

Adolescents have experienced their problems more intensively due to their age; especially they face stress at different levels during their adaptation to their environment and their eating habits are very significantly affected. The psychological and social disorders may influence obesity in children. Children suffering from obesity have weak relationships with their families, low self-esteem, perception of limitation in life conditions and feelings of humiliation and rejection [25].

In light of these findings, the following suggestions have been developed to provide a guideline how to settle the problems resulting from stress that affect adolescents eating habits and to decrease or eliminate the effects of stress on body weight:

- In order to decrease the effects of stress peculiar to adolescents and enhance their success, adolescents should be oriented to schools according to their areas of interest,
- It is important to teach adolescents time-management and study with time-tables to minimize the stress causing factors,
- Adolescents can take part in activities such as sports, music, etc. to alleviate the effects of stress.
- When they feel stressed, instead of eating or tucking in, they should be oriented to talk to friends about their problems or even to consult psychologists, through which the effects of stress can be decreased.
- Eating disorders which adolescents are faced with result in health problems. As a consequence of this, losing weight occurs, which leads to a disorder in the psychological balance in adolescents. In this situation, adolescents should be oriented to carry out useful activities and thus they may relieve the negative effects of their psychology.

CONCLUSION

If adolescents know their personality features, they can determine the degree of the prevention from stress. Also, they can link their ability to adapt themselves to environment and past experiences in parallel with the changes. The final results revealed there was a causal relationship between the stress and eating behaviors, specifically between having optimistic behavior and in need of social support and eating in negative and positive mood.

The study had some limitations. All measures were self-reported, with their validity depending on accurate reporting by the participants. Instruments may have a different meaning for all people such as the college and university students, women, elderly people etc. in the present investigation. Further research should examine causal relationships between psychological characteristics and eating disorders.

ACKNOWLEDGMENTS

The authors acknowledged the contributions of high school and university students in. We are extremely grateful for the students, school administrations, teachers and parents who volunteered their time to participate in this research.

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