AKRAN ZORBALIĞINDA BESLENME ALIŞKANLIĞI VE ÖFKE KONTROL TARZININ BİR ETKİSİ VAR MIDIR?

Öz
Bu çalışmada lise öğrencilerinde akran zorbalığının (AZ) beslenme durumu ve öfke kontrol tarzları arasındaki ilişkinin incelenmesi amaçlanmıştır. Farklı özellikleri 4 liseye (Kız Meslek; İmam Hatip; Anadolu; Erkek Meslek liseleri) devam eden toplam 210 öğrenci (yaş: 15,95 ± 0,702 yıl) çalışmaya alınmıştır. Demografik verileri ve beslenme alışkanlıklarına ilişkin bir anket formu ile birlikte akran zorbalığı belirleme ölçeği ve sürekli öfke-öfke tarz ölçeği uygulanmıştır. Öğrencilerin öfke toplam puanı ile AZ toplam puanı arasındaki aynı yönde önemli bir ilişki saptanmıştır. AZ ile öfke toplam ve alt ölçek puanları yönünden erkekler, kızlardan anlamlı olarak daha yüksektir. Cinsiyet faktörü ve eğitim türe ve beslenme alışkanlığının öfke ve AZ toplam puanında önemli bir etken olduğu, AZ’ın erkek öğrenciler arasında daha yaygın olduğu gözlemiştir.

Anahtar kelimeler: akran zorbalığı, öfke tarzı, beslenme, adolesan
DO DIETARY HABITS AND ANGER MANAGEMENT STYLE HAVE AN IMPACT ON PEER BULLYING?

Abstract

This study aimed to investigate the relationship of peer bullying (PB) with dietary habits and anger management styles in students studying at the high schools. A total of 210 students (15.95±0.702 years) were included in the study attending high schools with different features (School for Girls, Religious School, Anatolian School and School for Boys). Their demographic data and dietary habits were collected with a questionnaire along with the Peer Bullying Scale and the Permanent Anger Expression Style Scale. There was a significant positive correlation between total anger scores and total PB scores. Total and subscale scores of PB and anger of boys were higher than those of girls. Total bullying and anger scores of students consuming red meat and soft drinks every day were significantly higher than those who never or rarely eat.

It has been observed that gender, education type and dietary habits have influence on PB and anger scores of high school students and peer bullying is more common among male students.

Keywords: bullying, anger style, nutrition, adolescent

1. INTRODUCTION

Adolescence is the developmental period that begins with puberty and continues till the person reaches physiological maturity. Adolescence is a phase, in which the person experiences not only physical changes but also emotional changes (Koç, 2004). The perceptions, interpretations and reactions related to the physical and environmental changes caused by adolescence vary from person to person.

As in every age group, anger is one of the ways that adolescents use to express their emotions. Anger is a normal, healthy, and essential emotion that arises in reaction to specific situations (Spielberger, Johnson, Russell, Crane, Jacobs & Worden, 1985). Anger springs when the plans, wishes or necessities of a person are hindered or s/he perceives a kind of injustice, unfairness or threat against her/his personality.

Both internal and external events may be cause of anger. The ability to express angry feelings in an appropriate way can be obtained through anger management. The objective of anger management is to ensure expression of the feelings in a nonaggressive, non-violent and non-harmful manner. Outward expression of anger (anger-out) is manifestation of anger either with words or through behaviors and also a kind of adaptive reaction for dealing with stress induced by anger. Inward experience of anger (anger-in), on the other hand, is an alternative adaptation method against the anger factors that an individual holds in or conceals. Anger management indicates ‘to what extent’ one can control anger or ‘to what extent’ she has the potential to calm down in her/his relationships with others (Kerr & Schneider, 2008).
Health status, gender, school performance, relationships with family and friends are among the factors that determine the anger management style of an adolescent (Kerr & Schneider, 2008). Inability to express anger in appropriate manners may lead to physically aggressive behaviors that may ultimately result in psychological and social problems.

Violence involves all behaviors with the intent to psychological or physical harm to others. Violence may cause physical, sexual or mental injury. Negative experiences related to adolescence, adverse environmental conditions, poor school conditions, family structure, and problems experienced in the family can trigger the feelings of anger and violence in children and adolescents. The way of behavioral expression of anger and violence is a learned habit. When one gets angry at someone, anger is abreacted in the learned manner. When a child or adolescent observe adults, who cannot manage their angry and violent feelings or express them in an unhealthy way, s/he can imitate those unfavorable patterns (Ortiz & del Barrio Gandara, 2006).

Bullying may be defined as an aggressive behavior or intentional harm doing that is carried out repeatedly and overtime in an interpersonal relationship, which is characterized by an imbalance of power (Olweus, 1997; Winstok, 2009). Bullying is considered as a problem with various social, cultural, economic and historical aspects (Pigozzi & Machado, 2015). One may be involved in bullying as a victim, bully or bully-victim. Victims do not generally show reaction against aggression as their self-esteem is low and they fear peer rejection. On the other side, bullies usually tend to assume the leading role; they are dissatisfied with the school and often obtain a negative and provocative attitude towards their friends (Berger, 2007).

Studies have indicated bullying and victimization to be a significant problem that has become more prevalent in the last 25-30 years at schools (Baldry & Farrington, 2000; Popoola & Prevalence, 2005). It has been shown that; youths learn the verbal violence primarily from their family and school, they do it so to someone else while they have opportunity or in the right circumstances and they do that for satisfaction (Genç, 2016).

Globalization has provided many opportunities to make life easier for people, while it has led to some changes that will affect health negatively. While the changes in nutrition and lifestyle resulting from globalization have increased the frequency of noncommunicable diseases they have also caused an increase in the frequency of mental disorders on the other side. It is well known that in almost all societies and groups of age in recent years, there is an increase in violent behavior. It is known that the technological developments provided by globalization are better used by young people. In this direction, it is seen that violent behaviors are increasing not only on the streets but also on internet (siber bullying). It is not wrong to say that the media is a vehicle that nourishes violence, as it is now known that young people use media resources better (Gölbaşı, 2016).

According to the World Health Organization (WHO), mental health is one of the major health issues for adolescents; and moreover, the problems related to mental health will be the most significant health problems all around the world by 2020 (World Health Organization, 2005). It is frightening to think that violence, especially in children and adolescents, can continue partly in the adult period. For this reason, analyzing the factors that have impact on the feelings and behaviors of adolescents is of prior importance.
There are only a few studies indicating the correlation between malnutrition and poor mental health (Özenoğlu & Ünal, 2015). While the worries about mental health of children and adolescent are going on, significant changes have been observed in their eating habits. A study has reported that total energy, carbohydrate, sugar, sweet and soft drink consumptions of the children aged between 10-15 years have increased significantly (Cook, Rutishauser & Seelig, 2001).

Even though it is known that healthy diet is related with emotional well-being and better cognitive functions, the number of the studies investigating the effect of diet on feelings and behaviors of children and adolescents is limited. As diet is a modifiable factor, ‘the potential role of diet for reducing the incidence of mental problems in adolescents’ may be an important field of research.

There are studies addressing the reasons and frequency of peer bullying among high-school students in the literature; however, we have not encountered any study that investigates the influence of diet and dietary habits on the mode of anger expression and aggressive behaviors at this age group in Turkey. Therefore, we aimed to analyze the correlation between diet and anger management styles in students studying at the high schools and their equivalents located in Samsun city center.

2. MATERIAL AND METHOD

This study was conducted with 210 voluntary students, who were at the 10th or 11th grades in the 2014-2015 academic year. Four high schools in Samsun city center with different features [Vocational School for Girls (VSFG), Religious Vocational High School (RVHS), Anatolian High School (AHS), Vocational School for Boys (VSFB)] were selected through the simple random sampling method. Within the scope of the study, we applied a questionnaire form composed of questions regarding demographic data and dietary habits along with the Peer Bullying Scale Adolescent Form (PBSAF) and the Permanent Anger Expression Style Scale (PAESS) to the students included in the study. The body weight, height were taken by the researcher and Body Mass Index (BMI: body weight in kg / height in m$^2$) were calculated.

**Peer Bullying Scale Adolescent Form (PBSAF):** The Peer Bullying Scale Adolescent Form (PBSAF) developed by Pişkin and Ayas (Congress book (in Turkish), 2007, pp. 29-31) is composed of two parallel subscales, namely ‘bully subscale’ and ‘victim subscale’, in which the same content is questioned in different ways. While the bully subscale attempts to find out how often the child uses the words or behaviors mentioned in the scale, the victim subscale questions how often the child is exposed to those words or behaviors. The PBSAF consists of 53 items and 6 subscales, namely physical bully and victim, verbal bully and victim, bully and victim in case of isolation, bully and victim spreading rumor, bully and victim damaging goods, and bully and victim in case of sexual bullying. The scale is rated from 1 to 5; 1 meaning ‘never’ and 5 meaning ‘every day’. While the lowest score from each of the victim and bully subscales is 53, the highest score is 265. The higher score represents more severe cases of bullying and victimization.

As the statements in the ‘sexual bullying subscale’ were found inappropriate for the 10th and 11th grade students, the Peer Bullying Scale Adolescent Form was applied as a 43-item scale excluding the sexual bullying subscale. As a result, the highest possible score was 215 and the lowest possible score was 43 in our study.
Permanent Anger Expression Style Scale (PAESS): The PAESS was developed by Spielberger et al. (Spielberger, Jacobs & Russel, 1983, pp.159-187) in order to evaluate anger and permanent anger expression styles. The scale was adapted into Turkish by Özer (Özer, 1994). The scale consists of permanent anger, suppressed anger (anger-in), expressed anger (anger-out), and anger management subscales. The person is expected to rate ‘to what extent a given sentence describes her/him’ from 1 (almost irrelevant) to 4 (almost completely relevant). The lowest potential score for permanent anger subscale is 10 and the highest is 40; while the lowest potential score for each of the anger-in, anger-out and anger management subscales is 8 and the highest is 32. The items of each subscale generate the total score of relevant subscale. High scores obtained from the permanent anger subscale represent increased anger level, but the high scores from the anger management subscale indicate that the person has ability to control her/his anger. While the high anger-out subscale scores mean that anger can be easily expressed, the high anger-in subscale scores represent suppressed anger.

Statistical Analysis: The SPSS 15.0 was used for statistical analysis of the study data. Besides the descriptive statistics, the independent two-sample t-test, single factor analysis of variance (ANOVA) F-test, Kruskal Wallis (KW) chi-square test, and the Mann-Whitney U-test were also applied for analyses. The results were evaluated considering the 95% confidence interval and p ≤ 0.05 significance level.

Ethics Committee Approval: The study was conducted after obtaining the Approval no. KAEK 2015/22 dated 15.01.2015 of Samsun OMU Clinical Researches Ethics Committee and official permissions from the relevant school administrations.

3. RESULTS

The study population was composed of 133 female students (63.3%) and 77 male students (36.7%). The mean age of the students was 15.5 ±0.702 years; the mean BMI was 20.47 ± 3.137 kg/m^2; and the mean waists circumference was 78.035 ± 9.37 cm. There was significant difference between girls and boys regarding the mean BMI value (20.06 ± 0.269 kg/m^2; 21.11 ± 0.385 kg/m^2; p=0.023, p≤0.05, respectively).

The comparison of the students’ average total Peer Bullying Scale (PB) scores by the schools is given Table 1.

Table 1: Comparison of Students’ Total Peer Bullying Scale (PB) Scores by the Schools

The average total PB score of VSFG was found to be significantly lower as compared to RVHS and VSFB (p< 0.05).

When the physical victim subscale scores were compared according to the schools, the scores of at least one school varied, and that one school was either VSFG or RVHS (respectively 24.71±1.41 and 31.31±1.45; T-test: 2.848; p=0.039).

It was found when the scores of the physical bully subscale were compared by the schools that the scores of VSFG was significantly lower than the scores of RVHS and VSFB (respectively 20.81±1.07, 27.38±1.22, 26.75±1.69; F-test: 4.819; p= 0.003). However, no significant difference was observed between the schools regarding the scores obtained from other subscales.
The correlation between the PB total score and educational background of parents was investigated using the single factor analysis (F-test), but no significant correlation was found. Similarly, no significant link was observed between the PB total score and the number of siblings, of meals they eat a day, and the frequency of shopping at the canteen (p>0.05). The total PB score of the students with irregular daily eating routine (63.21±4.31) was higher as compared to those that had 2-3 meals one day (55.54±1.68) and that ate 4-5 meals one day (53.89±4.97); nonetheless, the difference did not appear to be statistically significant (p=0.266). Additionally, the students, who shopped at the school canteen at every break or at least 1-2 times per day (72.00±10.53 and 59.64±2.54, respectively), obtained higher PB scores than those, who never purchased from the canteen(47.87±1.45), but the difference was found to be insignificant (p=0.061).

The correlation of the total anger scores of the participants to the total peer bully scores was analyzed using the Pearson product-moment correlation coefficient, and a significant positive correlation was indicated (Pearson correlation: 0.006, p= 0.001).

The t-test was used for comparison of students’ PB and anger scores by gender; and the results are given in Table 2

Table 2: Comparisons of the Scores by Gender

The total permanent anger, expressed anger and anger scores of boys were found to be significantly higher than those of girls (p<0.05).

We made a comparison between the girls and boys regarding their total PB and subscale scores and determined that the total peer victim and peer bully scores as well as physical victim, verbal victim, and physical bully scores of boys were significantly higher than those of girls (p<0.05).

The total PB score and subscale scores were indicated not to have a significant relation with the body mass index (BMI) and PAESS. On the other hand, a significant negative correlation was detected between waist circumference and suppressed anger score (Correlation: -0.148; p=0.037).

The t-test was applied to analyze the link of total PB score with breakfast eating habit, but, although the scores of the students, who did not have a regular breakfast eating habit (65.297±24.778) were higher than those of the students that eat breakfast everyday (60.820±24.487), that difference was not considered statistically significant (t-test: -1.272; p=0.205). Similarly, the students that skipped breakfast at times were identified to have higher peer victim scores (58.583±23.811) as compared to those that eat breakfast everyday (55.324±20.108); however, the difference was not statistically significant (t-test: -1.049; p=0.296).

The peer bullying scores were also compared by the place, where the breakfast was had, through the single factor analysis of variance. The total peer bullying score of the students that ate breakfast out of home (e.g. at canteen or cafeteria) (70.117±3.525) was higher as compared to the students that have breakfast at home (61.238±2.049), but the difference was found to be insignificant (F test:2.042; p=0.133). The peer victim scores of the students eating breakfast at canteen or cafeteria (66.970±4.235) were, on the other side, found to be significantly higher than the peer victim scores of those having breakfast out of home (54.170±1.489) (F test: 5.487; p=0.005).

Table 3 shows the association of the total PB and anger scores with consumption of specific food.
Table 3: Association of the Total PB and Anger Scores with Consumption of Specific Food.

The t-test was applied to analyze whether the frequency of consumption of specific foods affects PB and anger total scores or not. As a result, the total PB and anger scores of the students that ate meat on daily basis were found to be significantly higher as compared to those, who never consumed meat (p<0.05). Additionally, the total PB and anger scores of the students eating chocolate per day were significantly higher than those of the students, who never ate chocolate.

Moreover, the T-test was used to make a comparison between the students, who consumed the specific food frequently, and those, who rarely (less than once a month) consumed that food, regarding the total PB and anger scores. The total PB scores of the students that consumed sugary drinks (processed fruit juice, coke, beverages etc.) or chocolate every day were observed to be higher in comparison with the students, who rarely had these specific food (p<0.05). Additionally, the total anger score of students that consumed sugary drinks everyday was also higher (p<0.05).

No significant correlation was encountered when the association of the total anger scores with the number of siblings, the number of meals they eat a day, and the frequency of shopping at the canteen was evaluated using the single factor analysis for variance (F-test). The total anger score of those with irregular daily eating routine (77.36±2.82) was higher as compared those that had 2-3 meals one day (75.02±0.96) as well as those that ate 4-5 meals one day (74.20±2.78), but the difference was not statistically significant (p=0.772). Furthermore, the students, who shopped at the school canteen at every break 85.00±8.28 or at least 1-2 times per day (75.85±0.99) had higher anger scores in total as compared to those, who never purchased from the canteen (70.00±3.50), but the difference was found to be insignificant (p=0.060).

The potential relation of PB score and smoking was checked through the Mann-Whitney U-test, and it was observe that the total PB score of smokers (127.00± 4.41) was statistically significantly higher than that of non-smokers (96.98±1.63) (p=0.027).

Table 4 shows the evaluation of the difference in the total anger scores by schools.

Table 4: Comparison of the differences in the Total Anger Scores According to the Schools

The difference between the total anger scores of the students by the schools they were attending was analyzed using the Kruskal-Wallis \( \chi^2 \) test, one of the nonparametric methods for single factor analysis of variance, and the school was indicated to have effect on the total anger score. The total anger score of VSFG was significantly lower than the total anger scores of AHS and VSFB (p<0.05).

Only the scores obtained from the suppressed anger subscale of the PAESS was detected to vary among the schools; the suppressed anger score of VSFG (15.67±0.60) was found to be significantly lower than AHS (17.98±0.72) (T-test: 3.161; p=0.026).

The Mann-Whitney U-test was employed to analyze the influence of smoking on anger scores; however, smoking was indicated to have no influence on the total anger score (p>0.05).
4. DISCUSSION

Studies have reported that almost in every culture men have higher tendency for acting aggressively and resorting to violence as compared to women (Liang, Flisher & Lombard, 2007; Carlyle & Steinman, 2007). While some studies suggest that men are more exposed to bullying or more frequently apply bullying (Pigozi & Machad, 2015; Rech, Halpern, Tedesco & Santos, 2013; Kaltiala-Heino & Fröjd, 2010), other studies indicate that there is no difference between men and women regarding involvement in bullying (Scheithauer, Hayer, Petermann & Jugert, 2009; Delfabbro, Winefield, Trainor, Dollard, Anderson, Metzer, et al., 2006).

It is believed that developmental differences may be the potential cause of such attitudes shown by women and men. Furthermore, the fact that men have higher tendency to act aggressively and adopt hostile attitudes towards their peers as compared to women may be attributed to the male-dominated society advocating and encouraging such behaviors of men (Ramirez, Andreu & Fujihara, 2001). The results obtained from a word association test indicated that boys and girls have different perceptions of violence (Araújo, Coutinho, Miranda & Saraiva, 2012). In that test, while girls expressed aggression using the words “harassment, disrespect, rudeness, pain and animosity”, boys used the words “steal, kill, swear, hitting and entertaining”.

Some studies have suggested that boys generally tend to be physically aggressive while girls tend to use indirect and verbal means of aggression; however, the sex difference is less for verbal aggression than for physical aggression. However, it is not an absolute finding because there are also contradictory findings in relevant literature. In the present study, the total peer bullying score of boys was significantly higher than the total peer bullying score of girls (Boys: 63.90±2.83; Girls: 52.63±1.60; p<0.05).

When the studies addressing the link of bullying and being bullied with gender under the concept of peer victimization were reviewed, the results regarding the sex differences were found to be similar to the results indicating sex differences in case of aggression. According to Olweus (Olweus, 1995), the incidence of physical bullying is more common among boys as compared to girls; and moreover, boys tend to be exposed to a greater amount of bullying than girls. In general, girls are bullied by boys and younger children are exposed to bulling from older children (Kaltiala-Heino & Fröjd, 2011).

In this study, the physical bullying score of boys was found to be significantly higher than that of girls (Boys 29.03±1.26; Girls 22.22±0.78; p<0.05). Unlike the results reported in the literature, the verbal bullying score of boys was found to be higher; however, the difference between two genders was not statistically significant (Table 2). Our results regarding the total anger score corresponds to the findings stated in the literature, in other words the total anger score of boys was higher compared to girls ( 78.26±1.14 and 73.67±1.16 respectively; p<0.05).

Contradictory results have been reported in relation to the investigation of the rate of bullying exposure in girls and boys. While some studies claimed that boys are more often exposed to bullying, some studies suggested that boys and girls are exposed to roughly equivalent levels of bullying (Pigozi & Machad, 2015; Rech, Halpern, Tedesco & Santos, 2013; Ramirez, Andreu & Fujihara, 2001). In this study, boys were identified to be exposed to significantly greater amount of bullying by their peers when compared to girls (Boys: 70.47±3.26; Girls: 58.33±1.80; p<0.05). However, these results are thought to have been contributed by the bullying among the male fellows.
There was significant variation among the schools participating in the study regarding the total anger score. The average of the total anger scores of the students from VSFB and AHL were significantly higher than the average of the total anger scores of VSFG students (p<0.05; Table 4). This may be due to the fact that all VSFG students were female.

The studies investigating the effects of the bullying behaviors of adolescents reported that the trauma symptoms (particularly anxiety, anger, post-trauma stress, and dissociation) are more common in the students involved in peer bullying either as bully or victim (Obrdalj, Sesar, Santic, Klarić, Sesar & Rumboldt 2013). It has been also suggested that bullying or bullied students get higher scores from the anger scale (Beran, Stanton, Hetherington, Mishna & Shariff, 2012), and are tend to show more aggressive behaviors as compared to other children (Camodeca & Goossens, 2005). Additionally, it has been also indicated that bullying is positively correlated to anger while exposure to bullying is positively correlated to anger, depression and anxiety (Foshee, Benefield, McNaughton Reyes, Eastman, Vivolo-Kantor, Basile, et al., 2016). A study reported anger to be the factor distinguishing bullies from the victims (Melander, Sittner Hartshorn & Whitbeck, 2013) and the children with high bullying level admit their anger (Golmaryami, Frick, Hemphill, Kahn, Crapanzano & Terranova, 2015).

We found a positive correlation between the total anger score and the total peer bullying score which is consistent with the literature (Pearson Correlation: 0.006; p=0.001). Lack of sufficient anger management skills may be one of the predisposing causes of peer bullying, on the other hand, bullying or being bullied may also give rise to anger.

The majority of children and adolescents are considered to have experienced bullying or being bullied during childhood (Guerra, Williams & Sadek, 2011). According to the theory of coping, children may act in high-risk manners for health in order to cope with the negative influences of such victimization (Lazarus, 1993) skipping breakfast, smoking, using alcohol or drugs are some of those potential manners. When it is considered that the bullying victims suffer from intense emotional, social and psychological distress, it may be normal to expect them to skip meals as they generally feel distaste (Polivy & Herman, 2005). School may easily turn into a scary, miserable and insecure place for those, who are exposed to bullying at school. Victims may wake up in the morning with complete anxiety or panic. Such fear and anxiety can lead them to lose appetite and thus skip breakfast. Skipping breakfast is a health problem with well-known physical and psychological consequences. The problem of skipped breakfast has become increasingly prevalent among children and adolescents. Many studies have indicated that skipping breakfast is associated with smoking, frequent use of alcohol, use of drugs, infrequent exercise and behavioral disorders (Sampasa-Kanyinga & Willmore, 2015; Keskirahkonen, Kaprio, Rissanen, Virkkunen & Rose, 2003). There are studies reporting that skipping breakfast is related with socio-economic status, family structure, and development of adiposity (Levin, Kirby & Currie, 2012).

In this study, we used the T-test to make comparison between the mean peer bullying scores of the students having breakfast regularly and of those skipping breakfast. The total peer bullying score of the students, who did not have breakfast regularly (65.297±24.778) was higher as compared to the students that had breakfast everyday (60.820±24.484); however, the difference between the two groups was not statistically significant (p=0.205). Similarly, the peer bullying victim scores of the students, who did not have breakfast regularly (58.583±23.811) was
higher than those of students that had breakfast everyday (55.324±20.108); however, the difference was not statistically significant (p=0.296). Furthermore, the peer bullying scores were also compared by the place, where the breakfast was had, through the single factor analysis of variance. The total peer bullying score of the students that ate breakfast out of home (e.g. at canteen or cafeteria) (70.117±3.525) was higher as compared to the students that have breakfast at home (61.238±26.049), but the difference was found to be insignificant (p=0.133). The peer victim scores of the students eating breakfast at canteen or cafeteria (66.970±4.235) were, on the other side, found to be significantly higher than the peer victim scores of those having breakfast out of home (54.170±1.489) (p=0.005).

These results appear to verify the fact that the individuals that either apply bullying or become bullied tend to skip the breakfast and compensate it out of the home due to psychological distress, and are consistent with the results of previous studies. Besides, having breakfast at places like canteen/ cafeteria with unhealthy foods may be a contributing factor for aggressive behaviors.

The association between dietary habits and emotional status is being increasingly addressed in studies. For example, a study conducted on Western societies reported that a diet, in which red meat and sweets foods are consumed in greater amounts, is associated with poorer mental health in early adolescence while diet, in which consumed higher amounts of fruits and vegetables are consumed, is associated with better mood and cognitive functions (Oddy, Robinson, Ambrosini, O’Sullivan, de Klerk, Beilin, et al., 2009).

A study researching the association of junk food consumption with mental health of children and adolescents (Zahedi, Kelishadi, Heshmat, Motlagh, Ranjbar, Ardalan, et al., 2014) documented significant association between the consumption of 4 specific food considered as junk food (sweets-cakes, beverages, fast-food, salty snacks) and presence of psychiatric problems (anxiety, insomnia, depression, confusion). It has been also indicated that consumption of junk-food other than sweets-cakes is significantly associated with violent behaviors (physical insult, bullying, and victimization). It was concluded from the study that the individuals consuming junk-food on daily basis are more likely to develop mental health problems.

When it was examined whether consumption of specific foods affects the total peer bullying and anger scores or not (Table 3), the average total peer bullying score of adolescents that had processed fruit juice, beverages and chocolate every day was significantly higher than that of adolescents consuming these food rarely (once a month or less) (p<0.05). The total peer bullying score of the students, who ate meat every day, (78.85±8.30) is significantly higher as compared to those, who never ate meat, (55.00±2.85) (p<0.05). Additionally, the average total anger score of the students, who consumed beverages on daily basis, (79.36±1.80) was significantly higher as compared to the students, who hardly ever consumed beverages (74.45±1.45). Similarly, total anger score of the students, who consumed meat on daily basis, (81.39±2.47) was significantly higher as compared to the students, who never consumed meat (72.27±2.66) (p<0.05).

The findings of the present study comply with the results of the studies indicating the association of unhealthy diet and high junk food consumption with mental health problems in adolescents (Zahra, Ford & Jodrell, 2014; Oellingrath, Svendsen & Hestetun, 20139). Excessive consumption of unhealthy food, such as sugar-added drinks, sweets, chocolate and salty snacks, are proved to be associated with high-risk regarding mental and behavioral disorders (Jacka, Rothon, Taylor, Berk & Stansfeld, 2013; Lien, Lien, Heyerdahl, Thoresen & Bjertness, 2006). Chocolate is known to have a relaxing effect due to being a carbohydrate source and containing...
serotonin precursor material, such as tryptophan and phenyl ethylamine. In our study, the total PB score of the students with higher daily chocolate consumption was found to be higher than the score of the students chocolate consumption; this may corroborate the view that people tend to consume more chocolate in order to relieve the stress they from.

On the other side, tea, coffee, chocolate, coke and some other beverages contain caffeine, which is known to be stimulant drug acting on the central nervous system (Martin, Cook, Woodring, Burkhardt, Guenthner, Omar & Kelly, 2008). Overconsumption of caffeine is stated to cause sleep disturbance, irritability, anxiety, panic attack and concern (Nehlig & Boyet, 2000).

Previous studies explained the reasons underlying the relationship between dietary habits and mental health (Özenoğlu & Ünal, 2015; Bellisle, 2004). Unlike the poor nutritional value of junk food, sufficient and balanced intake of food has the potential to improve mental health through various mechanisms. Because proper functioning of brain depends on sustained and regular food supplement. For instance, B-group vitamins (e.g. folic acid, B6 and B12 vitamins) and poly unsaturated fatty acids are necessary for the central nervous system to work properly. Several nutrients can affect emotional state especially through synthesis of neurotransmitters, particularly serotonin.

A study investigating the effects of nutrients on cortisol and mood under low- and high-stress situations have reported that high-carbohydrate and low-protein diet reduces depressive feelings and improves the ability to cope with stress under high-stress conditions. In the light of that our finding that the total peer bullying and anger scores of regular meat-eaters were significantly higher as compared to those, who never ate meat (Table 3) may be attributed to high protein content of meat.

In another study, researchers examined the association between dietary habits with mental health in adolescence (Oddy, Robinson, Ambrosini, O’Sullivan, de Klerk, Beilin, et al., 2009) and high scores of total anger, depressed anger, and aggressive behaviors were observed to be related with the Western diet, in which high amount of fast food, candies, bakery products and red meat are consumed.

The association of smoking and alcohol use with aggressive and violent behaviors have been also investigated in studies and it has been reported that there is a positive link between alcohol use and violence level mediated by increased anger, and also smoking increased when the individual has difficulty in dealing with the unfavorable emotions induced by anger (James, & Sigfusdottir, 2015; Mischel, Leen-Feldner, Knapp, Bilsky, Ham & Lewis, 2014).

In this study, we did not observe a statistically significant link between total anger score and the use of alcohol or alcohol consumption frequency. Nevertheless, smokers were identified to involve in bullying more often than non-smokers (127.00± 4.41 and 96.98±1.63 respectively; p=0.027). This has been interpreted as a high-risk behavior for health adopted by the adolescent to deal with the effects of bullying. Peer bullying has not been proved to be linked with alcohol use or frequency of alcohol use. Unlike the studies in the literature, we did not observe a significant association between alcohol use and the total anger and bullying scores, it may be due to the fact that alcohol use is not very common in this age group in Turkey.

Considering our findings, we have concluded that gender factor, education, and dietary habits have influence on peer bullying and anger scores of high school students and that an optimal diet may facilitate reducing behavioral problems. We think that the results of our study are
going to shed light on future studies because of the fact that it is the first study investigating the
effect of dietary habits on anger control and peer bullying in our society.

Junk food may increase the psychiatric distress and violent behaviors in children and ado-
lescents. Changing the dietary habits in a positive way may be effective approach in prevention
of mental health problems. On the other hand, skipping breakfast may be a possible sign of ex-
posure to bullying at school. Therefore, raising awareness among families on the issue may
enable closely follow the children skipping the breakfast and help them if necessary. Depres-
sion and skipping breakfast may lead to more severe eating disturbances in some children than
peer victimization can cause. There is a need for comprehensive studies to better understand the
mechanisms underlying link between diet and bullying.

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TABLES

Table 1: Comparison of Students’ Total Peer Bullying Scale (PB) Scores by the Schools

<table>
<thead>
<tr>
<th>Schools</th>
<th>N</th>
<th>Mean</th>
<th>Std Err.</th>
<th>Kruskal-Wallis Chi-Square Test (df=3)</th>
<th>Significant Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>VSFG</td>
<td>62</td>
<td>49,89</td>
<td>2,069</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RVHS</td>
<td>43</td>
<td>60,88</td>
<td>3,218</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AHS</td>
<td>47</td>
<td>56,30</td>
<td>3,214</td>
<td>2,821</td>
<td>0,04</td>
</tr>
<tr>
<td>VSFB</td>
<td>58</td>
<td>60,10</td>
<td>3,380</td>
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Table 2: Comparisons of the Scores by Gender
<table>
<thead>
<tr>
<th>Feature</th>
<th>Group</th>
<th>No</th>
<th>Mean</th>
<th>Std. Err.</th>
<th>t-test</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trait Anger</td>
<td>Girl</td>
<td>132</td>
<td>21.74</td>
<td>0.55</td>
<td>-2.187</td>
<td>0.030</td>
</tr>
<tr>
<td></td>
<td>Boy</td>
<td>77</td>
<td>23.58</td>
<td>0.58</td>
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<td></td>
</tr>
<tr>
<td>Anger thrown into the interior</td>
<td>Girl</td>
<td>131</td>
<td>16.12</td>
<td>0.38</td>
<td>-0.946</td>
<td>0.345</td>
</tr>
<tr>
<td></td>
<td>Boy</td>
<td>77</td>
<td>16.70</td>
<td>0.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expressed anger</td>
<td>Girl</td>
<td>131</td>
<td>16.46</td>
<td>0.40</td>
<td>-2.600</td>
<td>0.010</td>
</tr>
<tr>
<td></td>
<td>Boy</td>
<td>77</td>
<td>18.08</td>
<td>0.43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total permanent anger</td>
<td>Girl</td>
<td>132</td>
<td>73.67</td>
<td>1.16</td>
<td>-2.625</td>
<td>0.009</td>
</tr>
<tr>
<td></td>
<td>Boy</td>
<td>77</td>
<td>78.26</td>
<td>1.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer victim</td>
<td>Girl</td>
<td>123</td>
<td>58.33</td>
<td>1.80</td>
<td>-3.534</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Boy</td>
<td>77</td>
<td>70.47</td>
<td>3.26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer overbearing</td>
<td>Girl</td>
<td>123</td>
<td>52.63</td>
<td>1.60</td>
<td>-3.735</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Boy</td>
<td>77</td>
<td>63.90</td>
<td>2.83</td>
<td></td>
<td></td>
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<tr>
<td>Victim physical</td>
<td>Girl</td>
<td>128</td>
<td>25.59</td>
<td>0.88</td>
<td>-4.298</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Boy</td>
<td>77</td>
<td>32.77</td>
<td>1.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victims of verbal</td>
<td>Girl</td>
<td>128</td>
<td>8.68</td>
<td>0.34</td>
<td>-3.020</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>Boy</td>
<td>77</td>
<td>10.57</td>
<td>0.58</td>
<td></td>
<td></td>
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<tr>
<td>Victims groups</td>
<td>Girl</td>
<td>129</td>
<td>8.01</td>
<td>0.37</td>
<td>-0.920</td>
<td>0.359</td>
</tr>
<tr>
<td></td>
<td>Boy</td>
<td>77</td>
<td>8.61</td>
<td>0.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victims Social</td>
<td>Girl</td>
<td>129</td>
<td>6.41</td>
<td>0.31</td>
<td>-0.800</td>
<td>0.425</td>
</tr>
<tr>
<td></td>
<td>Boy</td>
<td>77</td>
<td>6.82</td>
<td>0.42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monetary victims</td>
<td>Girl</td>
<td>129</td>
<td>11.82</td>
<td>0.43</td>
<td>-1.259</td>
<td>0.209</td>
</tr>
<tr>
<td></td>
<td>Boy</td>
<td>74</td>
<td>12.80</td>
<td>0.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical bully</td>
<td>Girl</td>
<td>126</td>
<td>22.22</td>
<td>0.78</td>
<td>-4.862</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Boy</td>
<td>77</td>
<td>29.03</td>
<td>1.26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal bully</td>
<td>Girl</td>
<td>124</td>
<td>8.85</td>
<td>0.90</td>
<td>-1.265</td>
<td>0.207</td>
</tr>
<tr>
<td></td>
<td>Boy</td>
<td>77</td>
<td>11.00</td>
<td>1.61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group bully</td>
<td>Girl</td>
<td>127</td>
<td>7.11</td>
<td>0.22</td>
<td>-0.720</td>
<td>0.472</td>
</tr>
<tr>
<td></td>
<td>Boy</td>
<td>74</td>
<td>7.39</td>
<td>0.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social bully</td>
<td>Girl</td>
<td>127</td>
<td>5.44</td>
<td>0.17</td>
<td>-1.931</td>
<td>0.055</td>
</tr>
<tr>
<td></td>
<td>Boy</td>
<td>74</td>
<td>6.01</td>
<td>0.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monetary bully</td>
<td>Girl</td>
<td>126</td>
<td>10.82</td>
<td>0.26</td>
<td>-1.635</td>
<td>0.104</td>
</tr>
<tr>
<td></td>
<td>Boy</td>
<td>72</td>
<td>11.75</td>
<td>0.60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3: Association of the Total PB and Anger Scores with Consumption of Specific Food.

<table>
<thead>
<tr>
<th>Food Names</th>
<th>Group</th>
<th>Number</th>
<th>Mean</th>
<th>Std. Err.</th>
<th>t-test</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ready to drink Fruit</td>
<td>Everyday</td>
<td>54</td>
<td>64.39</td>
<td>4.18</td>
<td>2.155</td>
<td>0.033</td>
</tr>
<tr>
<td>Juice, cola, soft drinks</td>
<td>Sometimes</td>
<td>53</td>
<td>54.19</td>
<td>2.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chocolate</td>
<td>Everyday</td>
<td>52</td>
<td>61.40</td>
<td>3.69</td>
<td>2.045</td>
<td>0.045</td>
</tr>
<tr>
<td></td>
<td>Sometimes</td>
<td>19</td>
<td>48.74</td>
<td>1.44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Meat</td>
<td>Never</td>
<td>23</td>
<td>55.00</td>
<td>2.85</td>
<td>-2.869</td>
<td>0.006</td>
</tr>
<tr>
<td></td>
<td>Everyday</td>
<td>20</td>
<td>78.85</td>
<td>8.30</td>
<td></td>
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</tr>
</tbody>
</table>

Table 4: Comparison of the differences in the Total Anger Scores According to the Schools

<table>
<thead>
<tr>
<th>Schools</th>
<th>Number</th>
<th>Mean</th>
<th>Std. Err.</th>
<th>Kruskal-Wallis Chi-Square Test (df=3)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>VSFG</td>
<td>62</td>
<td>71.79</td>
<td>2,205</td>
<td></td>
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</tr>
<tr>
<td>RVHS</td>
<td>43</td>
<td>73.81</td>
<td>1,455</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AHS</td>
<td>47</td>
<td>78.96</td>
<td>1,418</td>
<td>16,655</td>
<td>0.001</td>
</tr>
<tr>
<td>VSFB</td>
<td>58</td>
<td>76.10</td>
<td>1,688</td>
<td></td>
<td></td>
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</tbody>
</table>

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