

Mental Health Condition of Socioeconomically Disadvantaged Adolescents and Physical Inactivity as a Risk Factor

Sosyoekonomik Dezavantajlı Adölesanların Ruhsal Sağlık Durumları ve Bir Risk Faktörü Olarak Fiziksel İnaktivite

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ABSTRACT Objective: Mental health problems emerge in early and late adolescence and it is an important public health problem. This study aimed to assess the mental condition in socioeconomically disadvantaged adolescents to determine risk factors that affect their mental condition and, assess the effect of physical inactivity as a risk factor for mental health conditions. **Material and Methods:** This descriptive study was conducted with 993 students in a secondary and high school. The Socio-demographic Characteristics Questionnaire Form, The General Health Questionnaire -12, and the Physical Activity Questionnaire were used to collect data. Data analysis was performed using descriptive statistics, chi-square test, regression analysis and multiple regression analysis. **Results:** The mean age of the participating students was 15.3±1.2 years (min=13-max=17); 53.9% of the students were male. The logistic regression analysis determined that the "female gender" and moderate/poor perception of academic achievement are important risk factors regarding poor/moderate mental health conditions. There were significant differences between age, gender, perceived academic achievement, and physical activity total score and mental health condition. **Conclusion:** In this study, approximately 1/3 of the students assessed mental health condition as moderate or poor. Regarding determining these problems in the early period, it will be important to assess the mental health condition of students while performing health screening within the scope of school health services.

Keywords: Adolescent; depression; exercises; mental health

ÖZET Amaç: Ruhsal sağlık sorunları erken ve geç adölesan dönemde ortaya çıkmaktadır ve önemli bir halk sağlığı sorunudur. Bu çalışma ile sosyo ekonomik yönden dezavantajlı adölesanlarda ruhsal durumun değerlendirilmesi ve ruhsal durumu etkileyen risk faktörlerinin belirlenmesi, ve ruhsal sağlık durumu için bir risk faktörü olarak fiziksel inaktivitenin değerlendirilmesi amaçlanmıştır. **Gereç ve Yöntemler:** Tanımlayıcı türdeki bu çalışma, bir ortaokul ve lisede öğrenim gören 993 öğrenci ile yürütülmüştür. Verilerin toplanmasında öğrencilerin Sosyo-demografik Özellikler Anket Formu, Genel Sağlık Anketi ve Fiziksel Aktivite Soru Formu kullanılmıştır. Verilerin analizi tanımlayıcı istatistikler, ki kare testi, lojistik regresyon analizi ve çoklu regresyon analizi kullanılarak gerçekleştirilmiştir. **Bulgular:** Çalışmaya katılan öğrencilerin yaş ortalaması 15,3±1,2 yıl olup (min=13-max=17) %53,9'u erkek öğrencidir. Lojistik regresyon analizine göre cinsiyetin kız olması ve akademik başarıyı orta/kötü algılamının orta/kötü ruhsal sağlık durumu için önemli risk faktörleri olduğu belirlenmiştir. Yaş, cinsiyet, algılanan akademik başarı durumu ve fiziksel aktivite toplam puanı ile ruhsal sağlık durumu arasında istatistiksel olarak anlamlı bir fark tespit edilmiştir. **Sonuç:** Bu çalışmada öğrencilerin yaklaşık 1/3'ü ruhsal sağlık durumunu orta ve kötü olarak değerlendirmiştir. Okul sağlığı hizmetleri kapsamında sağlık taramaları yapılırken öğrencilerin ruhsal durumlarının da değerlendirilmesi erken dönemde bu sorunların saptanması açısından önemli olacaktır.

Anahtar Kelimeler: Adölesan; depresyon; egzersiz; ruh sağlığı

During the adolescent period, which is defined as the age group of 10-19 years, many conditions and behaviors that have effect the health not only in this period but also in adulthood occur.¹ The population of adolescents globally has reached to 1.8 billion of which 2.6 mil-

lion died.² Detailed analysis of mortality data reported that suicide is the third largest cause of death in the adolescent, period.¹ Moreover, non-fatal mental problems pose a severe burden.^{2,3} Mental problems comprise a large part of problems experienced in the second decade of life. According to the World Health Organization (WHO) global report, approximately 20% of adolescents have ever experienced a mental health problem at any time in their life.⁴ Among the study conducted in Turkey; researchers reported that 17.5% of high school students suffered from depression.⁵ Turkoğlu (2014) found that 11.3% of females and 6.9% of males had depression.⁶ Therefore, promoting and protecting mental health in adolescents is important for public health.^{3,7}

Changes occurring in adolescence may manifest lifelong health outcomes.¹ Moreover, this situation has been observed to be the same for mental health problems. Many mental problems arise mostly in childhood and adolescence and continue into adulthood.^{7,8} Unhealthy habits such as smoking and alcohol and substance abuse generally commence in adolescence and are closely related to increased morbidity and mortality. Poor mental health in adolescence is known to be related to early age pregnancy, HIV/AIDS, other sexually transmitted diseases, domestic violence, child abuse, motor vehicle accidents, physical fights, criminal behavior, murder, and suicide.^{9,10} Conversely, life style behavior, technological developments, and modernized settled life styles cause an increase in diseases related to inactivity such as obesity and other non-communicable diseases.^{11,12} Physical activity has protective effects on various health aspects. In adolescence, physical activity has an important effect on the musculoskeletal system and cardiovascular health, increases academic achievement and self-respect and reduces depression/anxiety symptoms.¹³ McPhie and Rawana (2015) reported that adolescents who perform more physical activity were more vulnerable to the development of depressive symptoms.¹⁴ Another studies determined that a reduction in the frequency of physical activity was related to the occurrence of depressive symptoms.^{15,16} Variables

including age, gender, and academic achievement, educational background of parents are also related to the mental condition of an individual.^{5,6,17}

Studies determining the prevalence of mental problems in adolescents and the factors causing these problems, create a database for planning and providing mental health services for people in this period.¹⁴⁻¹⁷ Conversely, when the effect and burden of mental health conditions is considered, it is necessary to identify mental problems in adolescents and plan interventions. This study aimed to assess the mental condition in socioeconomically disadvantaged adolescents to determine risk factors that affect their mental condition and, particularly, assess the effect of physical activity on mental health.

Research Questions:

- What is the mental health condition in adolescents?
- What is the physical activity level in adolescents?
- Are the sociodemographic characteristics and physical activity level related to mental condition in adolescents?

What are the risk factors for moderate and poor mental health conditions in adolescents?

MATERIAL AND METHODS

STUDY DESIGN

This was a descriptive-cross-sectional study.

PARTICIPANTS

The province where this study was conducted has a settlement with good, moderate and poor socioeconomic characteristics. For this study, the researchers preferred a region with poor socioeconomic indicators comprising mostly shanty houses or new settlement areas, which were founded after migration. In the studies conducted in this area families were found to be disadvantaged in terms of socioeconomic characteristics.¹⁸⁻²⁰ Convenience sampling method was used in districts selection.

This study was conducted by simple random sampling in two schools: a secondary school and a

high school. The universe of the study comprised 1196 students: 942 high school and 254 secondary school students. The study used the complete enumeration method.²¹ Among these, 94, 38, and 61 students were not included in the study because they had not been in a classroom environment, did not accept to participate, and suffered from a health problem within the last week, respectively. The study group comprised 933 students. The participation rate was 83%. **Study inclusion criteria** were age 12 or older, being able to establish verbal communication; the **study exclusion criteria** were being reluctant to continue completing the questionnaire, incomplete questionnaire and students suffering from a health problem within the last week.

MEASURES

The researchers informed students and their families about the aim of the study. It was emphasized that the participation would be voluntary and the identifying information would not be collected. Questionnaires were administered to participants during a one hour course under the supervision of the researchers. The researchers attempted to administer the questionnaires to all students at the same time.

DATA COLLECTION TOOLS

The researchers collected data between March and April 2017. The Socio-demographic Characteristics Questionnaire Form, The General Health Questionnaire -12, and the Physical Activity Questionnaire were used to collect data.

The Socio-demographic Characteristics Questionnaire Form included six questions (about age, gender, mother educational background, father educational background, body mass index, and academic achievement) was developed by the researchers.

The General Health Questionnaire-12 (GHQ-12) was developed by Goldberg and Williams to determine possible mental disorders.¹⁹ Golberg et al. (1997) performed validity analyses.²³ Kılıç performed its Turkish and reliability.²⁴ Questionnaire sensitivity and specificity were calculated to be

0.74 and 0.84, respectively. GHQ included 12 items. For each question, there were four opinions ranging from “never,” “same as usual,” “more than usual” and “much more than usual.” Scoring for each scale item was made as 0-0-1-1. Participants who scored lower than 2 points, scored 2 to 3 points and scored more than 4 points were grouped as good, moderate and poor, respectively. In the GHQ-12, 2 or more points indicated the risk of possible depression.^{24,25} Ozdemir and Rezaki conducted a study to determine the appropriate cut-off point and validity of the GHQ-12 in determining possible depression in university students applying to a psychiatric clinic and found that the GHQ-12 was a useful screening scale in determining possible depression.²⁵ Cronbach alpha coefficient was found to be 0.83 in this study.

Physical Activity Questionnaire (PAQ) was developed by Crocker, Bailey, Faulkner, Kowalski and McGrath in the United States of America in 1997.^{26,27} Kowalski et al. (1997) performed its validity analyses.²⁸ Its Turkish validity and reliability analyses were performed by Emlek et al. In the first administration of the PAQ, Cronbach alpha coefficient was found to be 0.74, while it was found to be 0.82 in the second administration. This study found that the correlation value between the pretest and posttest scores ($r=0.74$, $p\leq 0.05$) in time invariance of the PAQ showed a positively strong and statistically significant relationship. The general scope validity index was calculated as 0.98.²⁹ Cronbach alpha coefficient was found to be 0.92 in this study. This questionnaire included nine items and examined the physical activities of the students from the past seven days, and the frequency of these activities was recorded. In this context, this questionnaire examined whether any of the specified activities (hopsotch, football, basketball, and gymnastics, etc.) were performed within the last seven days. Moreover, the questionnaire examined the level of participation in the physical education course and the student activities (and their frequency) during playtimes, lunch breaks, after school, in evening hours and at weekends. The frequency of sport, play, dance and other physical activities during the week were recorded. Activities

such as exercising, dancing or playing games within the last seven days were also examined. The minimum possible score of each item on the PAQ was 1, and the maximum was 5. The minimum PAQ score was 9, and the maximum was 45. The tenth item of the PAQ was not included in the calculation. This item was created to exclude the questionnaire of students from the assessment, if there was a situation that prevented them from performing a physical activity within that week.²⁶⁻²⁹

VARIABLES

Independent variables: Age, gender, educational background of parents, the status of academic achievement perception, body mass index, and physical activity level.

Dependent variables: Mental health condition

DATA ANALYSIS

Data were analyzed using SPSS Programme as summary statistics, unit numbers (n), percentages (%), mean [standard deviation (SD)] values were used. This study used chi-square test in comparing categorical variables; $p < 0.05$ value was accepted as statistically significant. Risk factors for mental health level were assessed using logistic regression analysis. The independent variable coded as 1 in the logistic regression analysis.

ETHICAL CONSIDERATION

To initiate the study, the researchers obtained necessary permissions and ethics committee consent form the Provincial National Education Directorate and from Selcuk University, Faculty of Health Sciences, Non-Interventional Ethics Committee (No:2017/33). Moreover, Informed consent was obtained from all individual participants included in the study and their parents. Informed consent form was sent to the families through the school and the families' consent was obtained.

STUDY LIMITATIONS

Because the study sample was school-based, there was a limitation to generalize the study results to other society-based adolescents. In this study, the number of variables affecting mental health condi-

tion was limited; therefore, it is important to examine the variables regarding students' familial, environmental, and biological characteristics in more detail. The use of a convenience samplings method is another limitation of this study.

RESULTS

PARTICIPANT CHARACTERISTICS

The mean age of the participating students was 15.3 ± 1.2 years (min=13-max=18); 53.9% of the students were male. Among the participating students' mothers, 15.6% did not complete basic education while 78.1% of fathers were primary school graduates. Of the students, 42.7% and 54.3% assessed their academic achievement as "good" and "moderate," respectively.

MENTAL HEALTH STATUS AND ASSOCIATED FACTORS

According to the General Health Questionnaire results of the students, 61.1%, 18.5%, and 20.3% had good, moderate, and poor health respectively. Based on the assessment of students' mental health condition, this study found that students who were 17-years or older ($x^2=6.154$) were female ($x^2=27.241$) and perceived their academic achievement as moderate/poor ($x^2=11.546$) had a higher percentage of moderate/poor health condition perception compared with other groups ($p < 0.05$). In groups formed according to the educational background of the parents, the general health levels showed similar distribution ($p < 0.05$). This study determined that the participants with moderate-poor mental health conditions had lower mean scores on the physical activity scale compared with participants with good mental condition ($p < 0.05$) (Table 1).

RISK FACTORS FOR MODERATE/POOR MENTAL HEALTH

The logistic regression analysis determined that female gender and moderate/poor perception of academic achievement were important risk factors regarding their mental health condition. Physical activity was found to be a protective factor, and as the physical activity score increased, a positive change occurred in the mental health condition (Table 2).

TABLE 1: Distribution of students' mental health status according to some variables.

Variables	General Health Status				Chi-square test	p
	Moderate/Poor		Good			
	n	(%)	n	(%)		
Age						
13-16 years	283	36.8	486	63.2	6.154	0.013
17 years and over	103	45.9	121	54.1		
Gender						
Female	218	56.5	240	39.5	27.241	< 0.001
Male	168	43.5	367	60.5		
Mother's education						
Illiterate	61	39.3	94	60.7	0.018	0.893
Elementary school and upper	325	38.8	513	61.2		
Father's education						
Elementary school gradu-ate	309	39.8	467	60.2	1.342	0.247
Secondary and upper	77	35.5	140	64.5		
Perceived academic achievement						
Moderate+Poor	247	43.4	322	56.6	11.546	0.001
Good	139	32.8	285	67.2		
BMI (kg/m²)						
Weak / Normal	308	38.8	485	61.2	0.002	0.967
Overweight/Obese	78	39.0	122	61.0		
TOTAL	386	38.8	607	61.1		
	Mean (SD)		Mean (SD)		t test	p
Physical activity total score	20.1 ± 6.5		22.0 ± 6.3		-4.181	< 0.001

TABLE 2: Risk factors for moderate/poor mental health status of students.

	β	Odds Ratio	95% Confidence Interval	p*
Age (17 years)	0.074	1.077	0.769-1.508	0.665
Gender (female)	0.653	1.922	1.451-2.545	< 0.001
Mother's education (literate / illiterate)	0.117	1.125	0.780-1.620	0.529
Father's education (elementary and lower)	0.088	1.093	0.790-1.511	0.592
Perceived academic achievement (Moderate+Poor)	0.519	1.680	1.280-2.206	< 0.001
BMI (overweight and above)	-0.037	0.964	0.693-1.340	0.826
Physical activity total score	-0.030	0.971	0.950-0.992	0.007

* Logistic regression analysis.

PHYSICAL ACTIVITY

This study examined the physical activity characteristics of students and found that activities frequently (seven or more times a week) performed during a week were running (32.5%), cycling (30%), playing football (26.2%), and playing volleyball (22.2%). Among the students, 33.8%, 39%, 33.8%, 46.1%, 34.0%, and 22.7% did not

perform any physical activity during play times, lunch breaks, after school, in evening hours, at weekends, and at leisure times, respectively. The rate of students who actively participated in all physical education lessons was 50.9%. Moreover, this study showed that the mean score of students on the physical activity questionnaire was 21.2±6.4.

DISCUSSION

The existence of mental disorders in adolescents may have potential long-term effects on both their social and personal lives. Therefore, this study is important regarding the assessment of the adolescents' mental conditions and planning interventions in the early period after determining the risk factors affecting their mental condition. Since this study was conducted in a socioeconomically disadvantaged region, it may provide important information for developing strategies to protect the mental health of adolescents living in disadvantaged regions. The region selected for this study was founded later after migration and unemployment is common in this region. Moreover, the study showed that students having mothers who did not complete basic education (five-year education) and fathers who had lower education levels, represented risky student groups.

In this study it was determined that age, gender and academic achievement is related to mental health condition (Table 1). Previous studies have emphasized that age is an important factor that affects the prevalence of a health condition. Studies, similar to the present study, have reported that the incidence of mental health problems increases with increasing age.^{30,31} The fact that mental condition gets worse with age may be attributed to physical, and emotional changes and familial characteristics.

The relationship between depression and gender varies by life cycles. This study found a significant difference between gender and mental health condition; the moderate/poor mental health condition perception levels of female students (56.5%) were higher than those of male students (43.5%). Moreover, males and females showed similar depression rates before adolescence, but there was a higher incidence of depression in females during adolescence.⁵ Lewis et al. (2018) explain that social and psychological factors as well as hormonal factors may contribute to the increase in the incidence of depression in girls.³²

However, some studies did not find a significant difference between male and female students

regarding depression scores, and some other studies determined that males experience depression more often than females.^{30,31,33,34} The diversity in results may be attributed to the sample size, distribution of females and males in the sample, the measurement tool used, or environmental factors in the study region. Higher depression prevalence in female students may persuade the researchers to assess the region for gender equality.

It has been reported that in adolescents poses a threat to their learning and performance. Low energy and concentration problems specific to serious depressive disorders may have negative effects on school success.³⁵ The result showed that there was negative effect of depression on student's academic achievement whereas there was a significance difference between the academic performance of the students having poor, medium and high level depression.³⁶ Consistent with literature information, the present study determined that people who perceived their also perceive their health condition as poor/moderate. It can be said that many factors can play a role in this relationship.

In this study, the logistic regression analysis determined that the female gender, the moderate/poor perception of academic achievement, and the status of physical activity are important risk factors regarding poor/moderate mental health condition (Table 2). In contrast to the present study, a study by Demir, Karaceyin, Eralp Demir, & Uysal, reported that the increasing age and the low level of the mother's education were positively related to the depression level.³⁰ Similar to the results of the present study, a study by Ozmen et al. determined that the BMI values had no effect on depression.³⁷ The present study found that physical activity was a protective factor (Table 2) and as the physical activity score increased, a positive change occurred in the mental health condition (Table 1). It was reported that the mental health was related to the physical activity in children and adolescents; however, the study designs were weak.^{38,39} According to a longitudinal study, it was found that adolescents who performed more physical activity were more vulnerable to the development of depressive symptoms.¹⁴ A systematic review study

stated that exercise improved self-esteem and decreased the depression scores.⁴⁰ Another study determined that the frequency of activity (over the moderate level threshold) and depressive symptoms show a negative correlation. The same study reported that, in multilevel mixed-effects models, the participation in sports and a greater frequency of physical activity, independently, contributed to lower depressive symptoms in both genders.⁴¹ According to previous studies, the effect of physical activity on depression may vary according to its frequency and intensity. The present study examined the general physical activity characteristics of students and found that the most common activity type was running. Moreover, students had inadequate sources for physical activity in out-of-school environments and physical education courses were not used effectively, and the physical activity scores of students were highly low. The present study also determined that the female gender and poor-moderate academic achievement perception, which are a risk factor for mental health conditions, were important determinants of the physical activity score and reduced the physical activity score. A systematic review reported that the variables including age, gender, parental education level, socioeconomic condition, self-efficiency, parental support, peer support, physical activity history, depressive symptoms and physical activity were related in adolescents.⁴² The present corroborated a previous study that showed that physical activity in adolescents was inversely proportional to age and that physical activity levels decreased with the increasing age.⁴³ Another study determined that the relationship between age and physical activity was not important.⁴⁴ Moreover, gender was an important determinant for participating in physical activity and compared with males; females had less physical activity levels.⁴³⁻⁴⁵ In contrast to the present study, a study by Kantomaa et al., reported that higher parental education level was related to higher physical activity in adolescents.⁴⁶ As shown in several studies, it can be said that physical activity is affected by many variables and this variable has a significant effect on depressive symptoms.

CONCLUSION

In conclusion, this study found that students living in a socioeconomically disadvantaged region experienced negative effects on their mental health and physical activity. One-third of the students had a moderate-poor level of mental health; moreover, increasing age, female gender, and poor/moderate academic achievement are risk factors. Thus, physical activity was found to have a protective characteristic for mental health.

Students who perceived their academic achievement as poor to moderate are likely to be at risk of having symptoms of depression. And several factors could play a role in this relationship. Therefore, further research is needed in this area specifically longitudinal studies.

IMPLICATIONS FOR PRACTICE

This study emphasized the importance of providing opportunities to the students living in this socioeconomically disadvantaged region. The basic strategies should be ensuring that students play more sports and have exercise opportunities in the school environment to support their academic success.

School nurses working in this socioeconomically disadvantaged region should perform mental health screening every year and direct students to physical activities. Moreover, they should be aware of disadvantages experienced by female students, and develop interventions for female students, older students, and academically unsuccessful students.

Creating or improving physical conditions so that students can participate in sports free of charge in socioeconomically disadvantaged regions may be beneficial regarding the mental health conditions of students. Thus, services to be planned within the scope of protective health services should be planned with student-school-family.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Alime Selçuk Tosun, Deniz Tanyer, Belgin Akın;

Design: Alime Selçuk Tosun, Deniz Tanyer, Belgin Akın; **Con-**

trol/Supervision: Alime Selçuk Tosun, Deniz Tanyer, Belgin Akın; **Data Collection and/or Processing:** Alime Selçuk Tosun, Emine Ergin, Tuba Özaydın; **Analysis and/or Interpretation:** Alime Selçuk Tosun, Deniz Tanyer; **Literature Review:** Alime Selçuk Tosun, Deniz Tanyer, Emine Ergin; **Writing the Article:** Alime Selçuk Tosun, Deniz Tanyer, Belgin Akın, Emine Ergin, Tuba Özaydın; **Critical Review:** Alime Selçuk-Tosun, Deniz Tanyer, Belgin Akın; **References and Findings:** Alime Selçuk Tosun, Emine Ergin, Tuba Özaydın.

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