

Adolescents Living in Orphanages in Ankara: Psychological Symptoms, Level of Physical Activity, and Associated Factors



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SUMMARY

Aim: Adolescents living in orphanages are at a disadvantage with respect to mental health. The aim of this study was to assess the distribution of psychological symptoms and their association with the level of physical activity (PA) in adolescents living in orphanages.

Method: The study group consisted of 13-16-year-old adolescents (N=166) living in orphanages in Ankara, Turkey. Data were collected cross-sectionally in 2008 via questionnaires, including the Brief Symptom Inventory and Kiddo-KINDL Health-Related Quality of Life Questionnaire. Descriptive statistics were used to summarize data, whereas chi-square, ANOVA, Mann-Whitney U, Kruskal-Wallis, and t tests were used to compare groups.

Results: Median age of the participants was 16.0 years and 65.7% were male. Female gender, not going to school or work, dissatisfaction with school, contact with the family, chronic disease, chronic medication use, sleep problems, regular tobacco use, chronic disease in the family, and low quality of life score were associated with increased risk (GSI-Global Symptom Index >1 SD) for mental disorders. Physically active adolescents' use of tobacco, alcohol, other substances, and medications, as well as GSI and depression scores were lower and their quality of life scores were higher than those of their less active counterparts.

Conclusion: Prevalence of psychological symptoms in adolescents living in orphanages were higher than in the general adolescent population. Physically active adolescents' mental health indices and abstinence behaviors with regard to tobacco, alcohol, and substances were more favorable. Encouraging adolescents to participate in sports and improving sports facilities in orphanages are interventions that can promote mental health.

Key Words: Adolescent, orphanages, mental health, sports.

INTRODUCTION

Health promotion, as one of the major components of preventive medicine, has emerged in the developed world as a concept for increasing an individual's control of their health. Thereafter, the concept was regarded as a key strategy in the 'Health for All' policy of the World Health Organization (WHO) (Bahar-Ozvaris 2006). Today, favorable environmental conditions are considered as crucial as individual responsibility in the health promotion approach (WHO 2006; van Lenthe et al. 2009).

In recent years physical activity has been one of the most emphasized topics with regard to health promotion and protection;

however, people -especially young people- have more sedentary lives, mainly as a result of development and dissemination of technology. Although there is a wide range of evidence that sedentary lifestyle has negative effects on physical health, similar studies on mental health are rather new. Nevertheless, there is growing evidence that physical activity protects and promotes mental health, in addition to physical health (Allison et al. 2005; De Moor et al. 2006; Górczynski and Faulkner 2010).

Several mechanisms have been proposed to describe physical activity's positive effects on mood, including the hyperthermic model (Daley 2002), endorphin hypothesis (Boecker et al. 2008), monoamine hypothesis (Dunn et al. 1996; Craft

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TABLE 1. Sociodemographic features of 13-16-year-old adolescents living in orphanages in Ankara (March 2008).

Sociodemographic features	Boys		Girls		Z*	p*
	n	%	n	%		
Age (years)						
13	18	16.7	3	5.4	-1.080	0.280
14	24	22.2	12	21.4		
15	12	11.1	12	21.4		
16	54	50.0	29	51.8		
Total**	108	100.0	56	100.0		
					x ²	p
School enrollment					1.516	0.218
Yes	92	84.4	52	91.2		
No	17	15.6	5	8.8		
Total	109	100.0	57	100.0		
Paid job						
No	98	89.9	56	98.2	-	0.060 ***
Yes	11	10.1	1	1.8		
Total	109	100.0	57	100.0		
Status of parents						
Divorced/separated	54	52.4	27	50.0	1.111	0.574
One or both parents died	41	39.8	20	37.0		
Still married/together	8	7.8	7	13.0		
Total	103	100.0	54	100.0		
Contact with family members						
Yes	82	75.9	48	87.3	2.906	0.088
No	26	24.1	7	12.7		
Total	108	100.0	55	100.0		

*Distribution of age with respect to gender was analyzed using median age, because age data were not distributed normally. Median age of the boys and girls was 15.5 and 16.0 years, respectively. **One girl and one boy did not respond to this question. ***Fisher's exact test was applied.

and Perna 2004), distraction hypothesis, and self-efficacy hypothesis (Craft and Perna 2004).

Numerous studies report that children and adolescents in need of protection with a history of childhood trauma are at greater risk of developing mental health problems than the general population (Bruhn et al. 2008; Erol et al. 2010; Wiik et al. 2010). Young people need to be raised in favorable and supportive environments for self-advancement, and to become self-confident, healthy and happy adults. Accordingly, their access to information, skills, health services, and care are of vital importance (UNFPA 2005).

In Turkey, services for children and adolescents in need of protection are delivered by the Prime Ministry Social Services and Children's Protection Agency (SHCEK). SHCEK delivers services related to foster care, adoption, cash transfers to families, and institutional care in orphanages for children and adolescents, homes of affection, and rehabilitation centers. In addition, SHCEK runs both boarding and daycare centers for children and adolescents. In 2009, SHCEK delivered services to 20,052 children and adolescents at 83 orphanages for children, 105 orphanages for adolescents, 160 children's homes, 18 homes of affection, and 38 child and youth centers. Protection services for 0-12-year-old children are delivered in orphanages for children, whereas services for 13-18-year-

old adolescents are delivered in orphanages for adolescents. In recent years, projects based on new service models, such as children's homes and homes of affection, which resemble the home environment, have begun (SHCEK 2010). In addition to meeting basic needs, such as accommodation, nutrition, and health services, SHCEK also works towards increasing opportunities for children and adolescents to benefit from arts, sports, and other supportive activities; however, studies assessing the agency's services indicate that despite improvement, existing opportunities for the above-mentioned activities remain inadequate (Turkish Prime Ministry Social Solidarity Fund 2006).

Most of the previous studies on adolescents living in orphanages in Turkey (Cakisoglu and Aktas 1997; Tumkaya 2005; Ustuner et al. 2005; Akay Pekcanlar et al. 2006; Aral et al. 2006; Simsek et al. 2007, 2008) focused on developmental and psychological problems. Among these, comparative studies showed that children and adolescents living in orphanages have more mental health problems than children and adolescents that live with their biological or foster family (Tumkaya 2005; Ustuner et al. 2005). Previous studies have examined various factors related to mental health, such as sociodemographics, family relationships, and school and orphanage life; however, no study has examined physical activity in adolescents and assessed its relationship to mental health.

TABLE 2. Distribution of Brief Symptom Inventory global and subscale scores among 13-16-year-old adolescents living in orphanages in Ankara (March 2008).

Global scores	Gender (nboys=104 ; ngirls=55)	Mean ± SD	Median	Minimum	Maximum	Statistical test	p
GSI *	Boys	0.98 ± 0.69	0.81	0.00	3.19	t= 3.848	< 0.001
	Girls	1.46 ± 0.84	1.26	0.00	3.66		
PST **	Boys	27.22 ± 14.33	27.50	0.00	53.00	t= 2.161	0.032
	Girls	32.25 ± 13.25	33.00	0.00	53.00		
PSDI ***	Boys	1.77 ± 0.69	1.61	0.00	3.75	Z = −4.006	< 0.001
	Girls	2.23 ± 0.76	2.36	0.00	3.80		
Subscale scores							
Depression	Boys	1.10 ± 0.82	0.92	0.00	3.67	Z= −3.887	< 0.001
	Girls	1.79 ± 1.08	1.75	0.00	4.00		
Anxiety	Boys	0.98 ± 0.78	0.85	0.00	3.54	Z = −3.434	0.001
	Girls	1.50 ± 0.92	1.23	0.00	3.69		
Negative-self	Boys	0.93 ± 0.75	0.75	0.00	3.00	Z = −3.398	0.001
	Girls	1.43 ± 0.91	1.33	0.00	3.67		
Somatization	Boys	0.79 ± 0.67	0.67	0.00	3.75	Z = −2.562	0.010
	Girls	1.08 ± 0.76	1.00	0.00	3.11		
Hostility	Boys	1.14 ± 0.81	1.00	0.00	4.00	Z = −1.971	0.049
	Girls	1.42 ± 0.88	1.43	0.00	3.86		

*GSI: Global Symptom Index. **PST: Positive Symptom Total. ***PSDI: Positive Symptom Distress Index.

Considering the need for further research on health promotion for disadvantaged youth in Turkey, the aim of the present study was to assess current situation of adolescents living in orphanages, with regard to their sociodemographics, school and orphanage life, general health status, and some health behaviors, with a focus on physical activity and psychological symptoms, and to determine if there were any associations between the level of physical activity and psychological symptoms. The main hypothesis of the study, which aimed to assess motivation and barriers to physical activity, and to serve as a reference for the development of relevant interventions for mental health promotion, was as follows: prevalence of psychological symptoms in physically active adolescents in orphanages will be significantly lower than those that are physically less active.

MATERIALS AND METHODS

Study population and sample

This cross-sectional study included 13-16-year-old adolescents living in four SHCEK (state run) orphanages in Ankara, Turkey. Adolescents older than 16 years were not included, as the quality of life questionnaire used in this study is not appropriate for individuals older than 16 years. No sample was selected and all adolescents between 13 and 16 years of age (N=176) were invited to participate, except for six refugees that did not speak Turkish and five mentally retarded adolescents. Of the 170 questionnaires completed by the adolescents, 166 were valid. The study group was considered representative of the study population, as the participation rate was 96%.

Data collection instruments

Data collection instruments used in this study included a questionnaire prepared by the researchers, Brief Symptom Inventory (BSI) and Kiddo-KINDL Health-Related Quality of Life Questionnaire. Data were collected in March 2008 via the survey technique under observation.

Questionnaire

The 47-item questionnaire used in this study included both multiple-choice and open-ended questions that assessed the adolescents' sociodemographic features, orphanage life, state of health and some health behaviors, leisure time activities, participation in sports activities, and opinions and suggestions concerning the sports facilities at their orphanage.

Brief Symptom Inventory (BSI)

BSI, which was developed by Derogatis (1992), is a Likert-type symptom screening scale composed of 53 items. The scale includes nine subscales and three global indices of distress (Derogatis and Lazarus 1994). Subscales in the original scale are somatization, obsessive-compulsive disorder, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism, whereas the global indices include the Global Symptom Index (GSI), Positive Symptom Distress Index (PSDI), and Positive Symptom Total (PST).

GSI is the global score of the scale and indicates an increase in the overall level of mental distress. PST indicates the number (diversity) of symptoms the individual reports experiencing,

TABLE 3. Percentage distribution of Global Symptom Index scores among 13-16-year-old adolescents living in orphanages in Ankara (March 2008).

	GSI* $\leq$ 1 SD**	GSI >1 SD	χ^2	p
Gender				
Boys (n=104)	89.4	10.6	10.250	0.001
Girls (n=55)	69.1	30.9		
School enrollment				
No *** (n=15)	60.0	40.0	5.318	0.033
Yes (n=139)	84.2	15.8		
Satisfaction with school				
Not satisfied (n=34)	70.6	29.4	5.549	0.018
Satisfied (n=86)	88.4	11.6		
Contact with family members				
Both nuclear and extended family members (n=26)	65.4	34.6	7.111	0.029
Nuclear family member/s (n=60)	80.0	20.0		
No contact (n = 31)	93.5	6.5		
Chronic Disease				
Yes (n=34)	61.8	38.2	12.326	< 0.001
No (n=123)	87.8	12.2		
Current use of medication				
Yes (n=44)	65.9	34.1	11.025	0.001
No (n=113)	88.5	11.5		
Sleep problems				
Yes (n=66)	68.2	31.8	14.728	< 0.001
No (n=82)	92.7	7.3		
Tobacco use				
Daily user (n=24)	66.7	33.3	5.448	0.020
Never user (n=98)	86.7	13.3		
Quality of life				
$\leq$ Mean score (n=72)	73.6	26.4	6.968	0.008
>Mean score (n=80)	90.0	10.0		
Chronic disease in the family				
Yes (n=31)	64.5	35.5	8.471	0.004
No (n=103)	87.4	12.6		

*GSI: Global Symptom Index **SD: Standard Deviation ***Adolescents out of school or work

whereas PSDI provides information on the average level of distress caused by existing symptoms.

The validity of the Turkish version of BSI was examined by Sahin and Durak (1994) in three separate studies. According to these studies, the scale consists of five factors: anxiety, depression, negative self, somatization, and hostility. Findings with respect to the validity of the Turkish form of BSI among adolescents were obtained via calculation of Cronbach's alpha coefficients for internal consistency. The internal consistency coefficient obtained for the total score of the inventory was .94, whereas the alpha coefficients for the factor subscale obtained via analysis of the distribution of items ranged between .70 (for depression) and .88 (for somatization) (Sahin et al. 2002).

As in some previous studies that used the BSI (Unlu et al. 2000; Bildik et al. 2004), one standard deviation was added to the mean global score of the scale (GSI) and adolescents with GSI scores equal to or below the calculated value were regarded as the low-risk group, whereas adolescents with GSI scores higher than the calculated value were regarded as the high-risk group.

Kiddo-KINDL Quality of Life Questionnaire - Adolescent Form

Kiddo-KINDL, developed specifically for children and adolescents, is a scale that measures health-related quality of life (Eser et al. 2008). According to the validity study, i) the Cronbach's alpha value for the scale was 0.95, ii) the correlation coefficient with respect to instruments measuring similar concepts was 0.70, and iii) the test-retest correlation coefficient was 0.80 (Ravens-Sieberer and Bullinger 1998). Cultural adaptation, as well as validity and reliability studies of the Turkish version of the scale for 8-12-year-old children and 13-16-year-old adolescents were conducted by Eser et al. (2004a,b). In the analysis, separate scores for six dimensions (physical well-being, emotional well-being, self-esteem, family, friends and school) of the scale can be calculated, as well as a total score for health-related quality of life (HRQoL), which is a combination of the aforementioned six dimensions. Higher scores indicate higher HRQoL (Eser et al. 2004a,b).

TABLE 4. Health-related features of 13-16-year-old adolescents living in orphanages in Ankara, with respect to their participation in sports activities (March 2008).

Participation in Sports Activities	Current medication use				x ²	p
	Yes		No			
	n	%	n	%		
Yes (n=143)	33	23.1	110	76.9	13.679	< 0.001
No (n=21)	13	61.9	8	38.1		
Tobacco use						
	Never user		Daily user			
Yes (n=112)	94	83.9	18	16.1	-	0.016*
No (n=16)	9	56.2	7	43.8		
Alcohol use						
	Never user		Weekly user			
Yes (n=109)	106	97.2	3	2.8	-	0.032*
No (n=17)	14	82.4	3	17.6		
Drug use**						
	Never user		Lifetime user			
Yes (n=144)	140	97.2	4	2.8	-	0.031*
No (n=18)	15	83.3	3	16.7		

*Fisher's Exact Test was applied. **Drug term was used to define illicit drugs, which can be excitatory, inhibitory etc.

Implementation of the study

Before the study was conducted, the SHCEK General Directorate approved the study protocol. Data were collected in March 2008 by one researcher that visited all four orphanages in Ankara during weekday evenings. To administer the data collection tools, adolescents were gathered in large rooms in each orphanage immediately after dinner. After describing the overall aim of the study and answering relevant questions, verbal informed consents were obtained and the questionnaires were administered under observation of the researcher.

As the study included several questions on sensitive issues, adolescents were asked to complete the questionnaires anonymously and use individual codes assigned by the adolescents themselves. After data collection and analysis, all orphanages were visited a second time, during which time the adolescents were informed individually and confidentially about their questionnaire results. Among the adolescents without a previous clinical diagnosis of mental disorder, 12 were in the high-risk group. The researchers were able to contact six of those adolescents and they were referred for further examination. At the end of the study, a final report that included the study's findings, conclusions, and recommendations for orphanages was submitted to the SHCEK General Directorate, as well as the orphanages.

Data analysis

SPSS v.16.0 was used for data analysis. Descriptive statistics were used to summarize data, whereas the t test, ANOVA (for normally distributed variables), Mann-Whitney U test, Kruskal-Wallis test (for variables not normally distributed) and chi-square test were used to compare groups, when ap-

propriate. For bivariate analysis, alpha value was taken as 0.05.

As the first step of analysis, all BSI subscale and global scores were taken as continuous variables, and descriptive statistics were applied. Thereafter, as performed in previous studies (Unlu et al. 2000; Bildik et al. 2004) regarding BSI, one standard deviation was added to the mean GSI score and adolescents were divided into two groups, as follows: i) adolescents with GSI scores higher than the calculated value (high-risk group for mental disorders) and ii) adolescents with GSI scores equal to or below the calculated value (low-risk group for mental disorders).

In this article, findings with respect to BSI and physical activity are primarily addressed, whereas findings concerning quality of life are addressed in a limited manner, as the number of variables studied was excessive.

RESULTS

Sociodemographics

This study was conducted at four state-run (SHCEK) orphanages in Ankara and included 166 adolescents aged 13-16 years. Among the participants, 65.7% were male and median age was 16.0 years. There wasn't any statistically significant differences in distribution of age between the boys and girls ($Z = -1.080$, $p = 0.280$). At the time of the study 86.7% of the adolescents were enrolled in school, whereas 1.8% of the girls and 10.1% of the boys had a paid job. In total, 51.6% of the adolescents' parents were divorced or separated, and 87.3% of the girls and 75.9% of the boys reported that they have contact with their nuclear and/or extended family (Table 1).

TABLE 5. Distribution of some scale scores among 13-16-year-old adolescents living in orphanages in Ankara, with respect to their participation in sports activities (March 2008).

Participation in Sports Activities	GSI * (Mean $\pm$ SD)**	t	p
Yes (n=139)	1.10 $\pm$ 0.73		
No (n=20)	1.49 $\pm$ 1.00	-2.136	0.034
	Depression (Median)	Z	p
Yes (n=139)	1.00		
No (n=20)	1.83	-1.985	0.047
	Total quality of life (Mean $\pm$ SD)**	t	p
No (n=19)	46.47 $\pm$ 15.60		
Yes (n=133)	53.80 $\pm$ 12.64	-2.293	0.023

*GSI: Global Symptom Index. **Mean $\pm$ standard deviation.

General state of health and health behaviors

Among the adolescents, 25.0% of the girls and 20.4% of the boys reported that they have at least one chronic disease; however, the difference was not statistically significant ($\chi^2=0.461$, $p=0.497$). The most common chronic diseases were eye diseases (mostly refraction problems) (18.8%), followed by mental disorders (15.6%). With respect to medication use, 32.1% of the girls and 25.9% of the boys reported that they were currently taking at least one medication ($\chi^2=0.706$, $p=0.401$). The most commonly used medications were psychiatric drugs (38.6%).

Among the adolescents, frequency of tobacco and alcohol use were 19.3% and 3.5% for girls, 23.6% and 18.9% for boys, respectively. In addition, 1.9% of the boys reported using illicit drugs. There wasn't a statistically significant difference between the genders with respect to tobacco use ($\chi^2=1.278$, $p=0.734$) however, more of the boys than girls used alcohol ($\chi^2=8.671$, $p=0.013$).

Among the girls and boys, 23.1% and 19.2%, respectively, reported that at least one member of their nuclear family had a chronic disease; however, the difference between the genders was not significant ($\chi^2=0.555$, $p=0.758$). Among the reported chronic diseases in the families, cardiac and respiratory diseases were the most common (30.0%), followed by mental disorders (16.7%).

Physical activity level

Participation in sports activities was assessed in two categories: i) participation in physical education (PE) classes at school, and ii) sports activities other than PE classes. Of the adolescents enrolled in school, 75.0% of the girls ($n=39$) and 83.5% of the boys ($n=71$) attended PE classes ($\chi^2=1.483$, $p=0.223$). In addition, 84.4% of the boys participated in non-school sports activities, versus 58.9% of the girls ($\chi^2=13.073$, $p<0.001$). Overall, median participation in sports activities was 4.0 days/week for boys and 1.0 day/week for girls, and

the difference between genders was statistically significant ($Z= -3.572$, $p<0.001$).

Attending physical education classes ($Z= -3.701$; $p<0.001$), living under institutional care for >5 years ($Z= -2.077$, $p=0.038$), using sports facilities at the orphanage ($Z= -2.102$, $p=0.036$), being encouraged to participate in sports ($Z= -2.630$, $p=0.009$), having physically active friends ($Z= -2.448$, $p=0.014$), and being a member of a sports team ($Z= -4.657$, $p<0.001$) were associated with being more active. In all, 57.7% of the girls and 56.5% of the boys thought that sports facilities and opportunities at their orphanage were inadequate ($\chi^2=0.009$, $p=0.923$).

Brief Symptom Inventory (BSI)

As the global BSI score, mean GSI was 1.15 ± 0.78 . With respect to the distribution of scores according to gender; GSI ($t=3.848$, $p<0.001$), PST ($t=2.161$, $p=0.032$), and PSDI ($Z= -4.006$, $p<0.001$) scores for the girls were significantly higher than those for the boys. Median values for all subscales were also significantly higher for the girls than for the boys, as follows: depression ($Z= -3.887$, $p<0.001$), anxiety ($Z= -3.434$, $p=0.001$), negative self ($Z= -3.398$, $p=0.001$), somatization ($Z= -2.562$, $p=0.010$), and hostility ($Z= -1.971$, $p=0.049$) (Table 2).

As described above, the study group was divided into two groups (high-risk and low-risk groups for mental disorders), with respect to one standard deviation above the mean GSI score. Accordingly, 17.6% of the adolescents in the study group were in the high-risk group for mental disorders. The percentage of high-risk adolescents was significantly higher among the adolescents ($n=46$) that reported having a clinical diagnosis of mental disorder or use of a psychiatric medication (35.6%) than among the adolescents ($n=114$) that did not specify any diagnosis or prescription (10.5%) ($\chi^2=13.931$, $p<0.001$).

Being female ($\chi^2=10.250$, $p=0.001$), not going to school or work ($\chi^2=5.318$, $p=0.033$), dissatisfaction with school ($\chi^2=5.549$, $p=0.018$), contact with the family ($\chi^2=7.111$, $p=0.029$), having a chronic disease ($\chi^2=12.326$, $p<0.001$), chronic medication use for any reason ($\chi^2=11.025$, $p=0.001$), sleep problems ($\chi^2=14.728$, $p<0.001$), regular tobacco use ($\chi^2=5.448$, $p=0.020$), chronic disease in the family ($\chi^2=8.471$, $p=0.004$), and low quality of life score ($\chi^2=6.968$, $p=0.008$) were associated with a higher risk ($GSI>1$ SD) of mental disorder; whereas such variables as age, duration of institutional care, and getting along with roommates were not significantly associated with GSI score ($p>0.05$) (Table 3).

Other notable findings with respect to BSI score were as follows: i) Depression scores were significantly higher among the adolescents that reported not being able to share their problems with orphanage staff ($Z=-2.195$, $p=0.028$) and, ii) Adolescents that regularly smoked cigarettes ($Z=-2.316$, $p=0.021$), regularly used alcohol ($Z=-2.700$, $p=0.007$), and used drugs at least once ($Z=-2.369$, $p=0.018$) had significantly higher PSDI scores, which indicated that their level of distress associated with their psychological symptoms was higher.

Factors associated with participation in sports activities

Among the physically active adolescents, body mass index ($t=-2.832$, $p=0.005$), use of tobacco ($p=0.016$), use of alcohol ($p=0.032$), use of illicit drugs ($p=0.031$), and use of medications ($\chi^2=13.679$, $p<0.001$) were significantly lower than among their less active counterparts (Table 4). In addition, total quality of life score was significantly higher ($t=-2.293$, $p=0.023$) and GSI ($t=-2.136$, $p=0.034$), and depression scores ($Z=-1.985$, $p=0.047$) were significantly lower in the physically active adolescents (Table 5).

Mean PSDI score in the adolescents that participated in sports activities for ≥ 2 days of the week was significantly lower than that in the adolescents with less or no participation in sports activities ($Z=-2.704$, $p=0.007$). In addition, adolescents with a higher level (≥ 2 days/week) of participation in sports activities had significantly higher quality of life scores ($t=2.118$, $p=0.036$): these adolescents spent more time with their peers ($\chi^2=4.306$, $p=0.038$) and had a higher sense of accomplishment ($\chi^2=5.403$, $p=0.020$). Similarly, adolescents that were sports team members reported having a higher sense of accomplishment ($\chi^2=7.062$, $p=0.008$).

DISCUSSION

This cross-sectional study included 166 adolescents aged 13-16 years that were living in orphanages in Ankara. As the global BSI score, mean GSI was 1.15 ± 0.78 . This mean value was higher than reported (0.75 ± 0.50) in the validity

and reliability study of the Turkish version of BSI, which was conducted with adolescents in Ankara aged 13-17 years old. In the present study, PST (which measures the diversity of symptoms reported to be experienced by the respondent) and PSDI (which measures the average level of distress caused by existing symptoms) scores were higher than those in the general population (Sahin et al. 2002). Ustuner et al. (2005) reported that the frequency of problem behaviors among 6-17-year-olds is 9.7% for those living with their biological parents, 12.9% for those living with a foster family, and 43.5% for those in institutional care. Similarly, Simsek et al. (2008) reported that the frequency of problem behaviors among a nationally representative group of 6-18-year-olds was 9.0%-11.0% for those living with their biological family, and 18.3%-47.0% for those in institutional care. SHCEK data (2006) showed that 45.5% of children in institutional care experienced adjustment problems or other psychological problems (Turkish Prime Ministry Social Solidarity Fund 2006).

In the present study, 35.6% of the adolescents that reported a history of a clinically diagnosed mental disorder or psychiatric prescription were in the high-risk group for mental disorders. This finding might have been due to differences between clinical interviews and scales used for screening of mental disorders (Furukawa 2010, Zimmerman et al. 2010), and/or remission of psychological symptoms in adolescents with a clinical diagnosis or prescription. On the other hand, the sensitivity of the scales used for screening are expected to be high; therefore, the aforementioned finding might indicate that the BSI cut-off point used in the present study, as in previous studies, needs to be re-evaluated following research based on clinical records.

In all, 12 of 114 adolescents (10.5%) without any self-reported clinical diagnosis of mental disorder or psychiatric prescription were in the high-risk group for mental disorders. This might have been due to a lack of disclosure regarding an existing diagnosis or medication use among the adolescents. The same finding, on the other hand, indicates that screening tests such as the BSI might be useful for identifying high-risk groups from among disadvantaged groups, such as children and adolescents in need of protection, who can then be referred for relevant healthcare services.

In the present study, all BSI global scores and subscale scores were significantly higher among the girls which may indicate that the girls had a higher risk for mental disorders than the boys. Likewise, Tumkaya (2005) reported that the level of hopelessness among girls in orphanages was higher than that among boys, and Cakisoglu et al. (1997) noted that 14-17-year-old girls living in an orphanage had a higher level of psychological symptoms than boys living in an orphanage. Simsek et al. (2008) reported that internalizing problems, such as depression, anxiety, and social introversion were more common among girls, whereas externalizing problems, such

as noncompliance with rules and aggressive behaviors were more common among boys in institutional care. There are a wide range of study findings pointing out to gender differences in mental problems. These gender differences, which usually become evident during adolescence, has been attributed to hormonal mechanisms that affect brain development and functioning (Martel et al. 2009), effects of gender roles, such as inequality in access to health care (Chibber et al. 2008), and to different environmental influences, e.g. history of trauma (such as sexual abuse) being more common among girls (Chamberlein et al. 2006).

In the present study, prevalence of psychological symptoms in adolescents that did not go to school or work were higher than adolescents that were enrolled in school. Previous research shows that adolescents that go to school tend to be healthier than dropouts and that health indicators improve as the level of education increases. In addition, dropping out of school was linked to such risky behaviors as tobacco use, drug use, and a sedentary lifestyle (Freudenberg and Ruglis 2007). The literature also contains evidence that dropping out of school is associated with a higher risk for mental problems (Tramontina et al. 2001; Nesman 2007). Akay et al. (2006) reported that as the level of education increased, anxiety and depression scores were significantly lower among girls in institutional care.

With respect to variables related to orphanage life, depression scores were significantly higher among the adolescents that reported that they could not share their problems with orphanage staff. Simsek et al. (2007, 2008) noted that adolescents that did not get along with orphanage staff faced mental problems more frequently and that a supportive attitude towards providing care among staff was a protective factor. These findings indicate that orphanage staff have a significant role in adolescents' lives and indicate the importance of their attitudes towards adolescents.

In the present study, analysis of psychological symptoms showed that adolescents with a known chronic disease had a higher risk for mental problems. This finding supports previous studies that have provided evidence of the negative mental health effects of chronic diseases (Discigil and Ozkisacik 2006; Lando et al. 2006). Among the lifestyle factors examined in the present study, regular tobacco use was associated with a high risk for mental disorders, and regular tobacco and alcohol use, and lifetime drug use were associated with a high level of distress caused by psychological symptoms. These findings, which indicate the co-occurrence of mental disorders with the use of tobacco, alcohol, and drugs, are in agreement with those of previous studies (Chang et al. 2005; Gouzoulis-Mayfrank 2008; Simsek et al. 2008).

The present findings show that the adolescents' quality of life scores decreased as their BSI scores increased. These find-

ings, which support the association between mental health and quality of life, was previously reported. Bilge et al. (2008) reported that quality of life scores in male adolescents living in an orphanage in Izmir decreased as the quantity of their psychological symptoms increased. Similarly, in a study with adolescents in need of protection, Carbone et al. (2007) reported lower quality of life among 13-17-year-old adolescents that experienced mental problems.

Physical activity, which was the main independent variable in the present study, was associated with adolescents' mental health and some health behaviors. Among the adolescents in the study, the level of participation and total time allocated to sports activities were significantly higher among boys than girls. Similarly, an international study by WHO (2001-2002) showed that boys were physically active at least one hour per day more than girls (Currie et al. 2004). The literature shows that the level of physical activity among children and adolescents declines with age; e.g. as compared to 12-year-olds, the level of physical activity among 18-year-olds is reduced by half; however, boys continue to be more active than girls throughout those years (Meredith and Dawyer 1991).

Previous research on physical activity and mental health (Bernaards 2006; Tessier et al. 2007) showed that physical exercise, when performed regularly, has positive effects on mental health, and that the prevalence of depression and anxiety disorders are lower among individuals that exercise regularly (De Moor et al. 2006). Numerous studies conducted with patient groups and healthy groups also show that physical activity has favorable effects on the treatment of mental disorders (Gorczyński and Faulkner 2010).

In the present study, physically active adolescents' GSI and depression scores were significantly lower than those of the less active adolescents. Mean PSDI score was also lower among the adolescents that participated in sports activities for ≥ 2 days of the week. According to WHO (2008), regular physical activity reduces the frequency of such risky behaviors as tobacco, alcohol, and drug use among youth. The present findings also support this association; the frequency of tobacco, alcohol, and drug use among the physically active adolescents was lower than that among their less active counterparts.

Achievement and self-realization have significant roles in the psychosocial development of young people. According to one theory of physical activity and self-confidence, physical activity enhances physical skills and thus leads to increased self-confidence (Bahrke and Morgan 1978). Findings of the present study also indicate that adolescents that spent more time in sports activities or were members of a sports team had a higher sense of accomplishment than their peers.

In the present study, adolescents that attended physical education classes, had physically active friends, were encouraged

to participate in sports, and used sports facilities at their orphanage were more active. These findings are indicative of the role of environmental factors in the health promotion approach, and are significant with respect to planning interventions that increase physical activity among adolescents in institutional care.

In addition to the important findings with regard to adolescents living in orphanages, the present study has some limitations, i.e. most of the variables, such as health behaviors, clinical diagnosis, and prescriptions were self-reported. Despite increasing evidence in the literature of the validity of self-reported data on adolescents' health behaviors, such as physical activity and drug use (Brener et al. 2003; Donohue et al. 2007; Trost et al. 2007; Sawatzky et al. 2010), use of medical records, especially for determining clinical diagnoses, will increase the quality of data in future studies. Although the validity and reliability of the Turkish versions of the scales used in the present study were reported, diagnostic clinical interviews were not performed; hence, analysis was conducted with psychological symptoms rather than clinical diagnosis. Further studies on this topic, enhanced by structured clinical interviews, will contribute to verifying the present findings. Despite its limitations, the present study provides important data about adolescents living in orphanages, where further research, and interventions on health and quality of life are needed.

CONCLUSION

When compared to the general adolescent population, adolescents living in orphanages are disadvantaged, based on their mental health scale scores, clinical diagnosis of mental disorders, and use of medications. Factors that are associated with mental health in adolescents need to be taken into consideration for protection and promotion of health in orphanages. These factors might be useful in identifying mental health needs of adolescents, such as preventive services or early diagnosis of existing problems.

Enabling children and adolescents in institutional care to benefit from preventive, curative, and rehabilitative mental health services in an integrated and continuous manner will reduce the incidence of mental problems and prescriptions. The mental health care model in orphanages should not be comprised solely of solving health problems in children and adolescents; thus, the current model needs to be broadened, so as to include health protection and promotion of health. Within this scope, addressing the environment in which adolescents live is of vital importance. Interventions related to life skills development, encouraging adolescents to regularly participate in physical activities, and improving sports facilities and opportunities in orphanages are important for mental health promotion.

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