LONELINESS AND ASSOCIATED FACTORS IN HIGH SCHOOL ADOLESCENTS: CROSS-SECTIONAL ANALYTIC STUDY FROM TURKEY*

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Abstract:
In this period adolescents may have to deal with many problems. One of these problems is the feeling of loneliness and over time can create bigger problems for the adolescent. This study is cross-sectional study to determine loneliness, and associated factors in high school students. This study employed a cross-sectional design and was implemented with 657 students attending high school. Sample size in the research was calculated as 657 persons by using 99% power and 95% significance interval and multi-sampling method was used in sample selection. A Personal Information Form and UCLA Loneliness Scale were used in this study. Descriptive statistics, unrelated samples t test, one way analysis of variance, levene homogeneity of variance test and Kruskall Wallis test were used to evaluate data. When characteristics of the adolescents were investigated; 46.0% were female, 30.6% were in 9th grade, 40.9% were 17 years old and the adolescents in the study reported moderate level of loneliness. Female students ($=52.33 \pm 5.82$) had a higher loneliness level when compared to male students ($=49.74 \pm 7.45$). Mean loneliness scores were higher in female students ($t=5.001$, $p=0.000$), in students studying in Science High School ($=15.559$, $p=0.004$); those whose mothers worked ($t=2.370$, $p=0.018$); those whose Internet use led to anger/depression ($t=2.429$, $p=0.015$); in adolescents who have thought of self-harm in the last year ($t=3.043$, $p=0.002$). In the study, the loneliness level of adolescents were not affected by the following factors: living with parents or in dormitories ($t(649)=0.378$; $p>0.05$), family structure ($t(641)=1.702$; $p>0.05$), the area they live ($F(2.654)=2.342$; $p>0.05$), income level ($F(2.654)=1.978$; $p>0.05$), availability of sufficient pocket money/allowance ($t(665)=0.033$; $p>0.05$), number of siblings ($F(2.633)=0.468$; $p>0.05$), relationships with siblings ($t(623)=1.209$; $p>0.05$), the father's education ($F(3.648)=1.596$; $p>0.05$) and the mother's education ($X2(3)=0.965$; $p>0.05$). The study found that students had a moderate level of loneliness, and the factors including being female, having a working mother, internet use resulting in anger/depression and thoughts of self-harm in the last year led to a higher loneliness score.

Key-words: *adolescent, loneliness, associated factor, Turkey*

Introduction

Adolescence is the last stage of childhood and first stage of adulthood. In this period, friendships become very important, and fast and intensive changes happen in the adolescent's life [2, 12]. Adolescents can demonstrate emotions, thoughts, attitudes and behaviour specific to this period such as emotional outbursts and excitement, being easily offended and destructive behaviour in relationships, defiant behaviour toward authority figures such as parents, teachers, showing resistance to follow rules, attention seeking and roles seeking [13].

Adolescents distant themselves from their families and respond more to their peer groups and develop an environment to create a sense of identity outside of their families [12]. In this period adolescents may have to deal with many problems [20]. One of these problems is the feeling of loneliness and over time can create bigger problems for the adolescent [40].

Loneliness is typically defined as being physically alone in a society. However loneliness is a negative feeling caused not necessarily only by being physically alone. One can feel alone even when he is with other

people. Therefore, the feeling of loneliness stems from insufficient level of social relationships and the low level of satisfaction obtained from such relationships [4]. Loneliness is a universal feeling and everyone can be affected from time to time [40]. The common aspect of all kinds of loneliness is the accompanying pain [17].

There are many factors of loneliness felt by the adolescent in the literature. Researchers believe that the characteristics of adolescence and development stages especially contribute to the feeling of loneliness [25]. In this period a series of developmental changes occur; the loneliness of the adolescent is affected by several factors such as cognitive, physical and psychological development, identity and personal development. In addition to the above, adolescents are reported to be affected by other factors such as peer relationships, adolescent autonomy, building new relationships [15, 23].

Loneliness emerges with changes in the personal development and social interaction with the society and it is associated with many variables such as shyness, social anxiety, self-esteem [15], introversion [14], age, gender [33], social class [40] and largely determined by the socio-economic structure [33]. Some studies reported that loneliness increases the distrust one feels about his community [33], is an emotional problem which needs psychological help and at a pathological level, loneliness can compromise the psychological/mental health of the person [19].

Adolescence is an important developmental period to study the feeling of loneliness [11]. The feeling of loneliness is very common among adolescents [17, 39]. In the study in adolescent high school students, Eskin [17] reported that the feeling of loneliness was very common among adolescents, which was an anticipated result. For example 65% of the participants gave the answer yes to the question, "Are there any moments which you feel very lonely?". Additionally 33% of the students scored above average and approximately 20% of the students scored one standard deviation from the mean score in the UCLA Loneliness Scale. These percentages demonstrated how common the feeling of loneliness among adolescents was. Considering the fact that the feeling of loneliness can trigger many serious problems, most notably suicide, the need for further studies on the different aspects of

this subject is evident. In the recent years, fast changes and developments worldwide affected the healthcare system in the similar way they affected all other areas [22]. Therefore nurses have a major responsibility. Feeling of loneliness, and the factors associated with loneliness in the adolescent can be determined and effective communication and interaction techniques can be taught to provide solutions for loneliness. Nurses especially have a key role in the diagnosis of loneliness and prevention of suicide in primary care healthcare centres. With the help of the findings of the studies conducted in adolescents, nurses can identify adolescent's personalities, and use social support sources to help him improve his social skills and encourage him to have a healthier life style to prevent loneliness. These measures can ensure long term well-being of the adolescent and prevent early death [18]. Because loneliness is mostly associated with depression and this can lead to suicide of the adolescent. Developments in nursing services aim to help people to maintain their physical, emotional, cognitive and social development in a normal way. Family centred care, keeping complications at the minimum, maintaining school life and improvement of the quality life play an important role in achieving this goal [34]. Therefore, this study was conducted to determine loneliness, and associated factors in high school adolescents.

To achieve this aim, answers for the following question were sought:
1. What are the mean score loneliness of adolescents?
2. Is there significance among adolescents' socio-demographic characteristics and loneliness?

Materials and Methods
Study area and design
The population of this study was a total of 17583 high school students studying in 26 schools in the city centre of Trabzon during the spring semester of the school year 2013-2014. The study was conducted in five schools that represent each school group, namely Trabzon Science High School, Pelitli Ahmet Balli Anatolian High School, Atatürk Vocational High School for Health, Anatolian İmam Hatip High School and Trade Vocational School in the city centre of Trabzon. A total of 3289 students attended to these schools during the school year 2013-2014.

Sample size in the research was calculated as 690 persons by using 99% power and 95% significance interval and multi-sapling method was used in sample selection. Some of the students did not give answers to some of the items in the data collection tools (n=13), and some of them changed their minds later and left the study (n=20), the results of these students were removed from the study and the data obtained from 657 students (95.2%) were evaluated.

Tools

A Personal Information Form and UCLA Loneliness Scale were used in this study.

Personal information form: The personal information form consisted of 33 questions about characteristics of students and students' families, which were thought to have a potential to affect loneliness and prepared in the light of literature review to obtain personal information of adolescents in high schools [7, 9, 16, 27, 32]. These questions were prepared under five sections: general demographics, parental and socio-economical characteristics, school and peer relationship characteristics, use of internet and telephone for communication purposes, healthcare problems and quality of life of adolescents.

UCLA loneliness scale: In the original UCLA Loneliness Scale there are 20 items; 10 items have negative and 10 items have positive expressions and a Likert type scale from 1 (never) to 4 (always) is used. Russell et al. [29] determined that Cronbach alpha internal consistency coefficient was 0.94 and the correlation coefficient with repeated observations with a 2 month interval was 0.73. The alpha internal consistency coefficient was 0.96 and the correlation coefficient with repeated observations with a 5 week interval for the Turkish version of the UCLA Loneliness Scale. The minimum score in the UCLA Loneliness scale is 20 and the highest score is 80. As the score increases, the loneliness level of the person also increases. Demir [10] calculated the Cronbach alpha reliability coefficient of the scale as 0.96. Cronbach's alpha coefficient in the current study was 0.83.

Data Analysis

To analyse the data obtained from adolescents of high school students under the scope of the survey, firstly answers of the students have been transferred to statistical package for social sciences–SPSS, version 18. In the evaluation of the data, descriptive statistics (frequency and percentage values, minimum, maximum, average and standard deviation), t test in unrelated measurements, Levene homogeneity test, Kruskall Wallis test, Mann-Whitney U test, one way variance analysis and LSD multiple comparison test are used.

Ethical considerations

Adnan Menderes University Medical School for research Non-invasive Clinical Research Ethics Committee protocol number 2014/320 dated 01.17.2014 has been allowed by decision No. 4. Trabzon Provincial Directorate of National Education has received the necessary permits for research. Students who participated in our study volunteered and signed a written consent before the research. It was stated that if they want students could withdraw from the research.

Results

In the study, 46.0% (n=361) of the adolescents were female, 30.6% (n=205) were in 9th grade, 30.9% (n=207) were 17 years old, 31.2% (n=209) were in Imam Hatip High School, 91.8% (n=614) lived with their parents, 82.8% (n=554) had nuclear families, 59.8% (n=400) lived with their parents in the city, parents of 96.9% (n=648) of the students were alive, 98.5% (n=659) did not have any step family member, 68.0% (n=455) reported that their family's income and expenses were balanced, 77.4% (n=518) had sufficient amount of monthly allowance, 39.5% (n=264) had three siblings, 69.5% (n=465) has good relations with their sibling(s), 27.5% (n=184) reported that their fathers were high school graduate, 54.6% (N=365) reported that their fathers were self-employed, 79.7% (n=533) had good relations with their fathers, 67.9% (n=454) reported that their fathers were tolerant towards them, 39.0% reported that their mothers were elementary school graduates, 78.8% (n=527) reported that their mothers did not work, 88.6% (n=593) had good relations with their mothers, 76.4% (n=511) reported that their mothers were tolerant towards them, 59.5% (n=398) were moderately successful in school, 88.2% (n=590) reported that they never had to repeat a year, 57.4% (n=384) had good relations with their

teachers, 75.6% (n=506) had good relations with their friends, 94.8% (n=634) had a close friend 68.5% (n=458) had memberships to online friendship sites, 95.2% (n=637) did not have friends through Internet, 74.3% (n=497) had Internet connection at home, 35.9% (n=240) went online at home, 94.9% (n=635) had a device that could make them online at home, 87.9% (n=588) had a device that could make them online at home other than computers, 7.2% (n=48) used all said devices to be online, 42.5% (n=248) did not send text messages using their cell phones.

The mean score of the high school students in the UCLA Loneliness Scale was 51.14±6.74. Adolescents in this study were found to have moderate level of loneliness (Table 1).

Scale	N	Minimum	Maximum	X	SS
UCLA Loneliness Scale	657	20.00	80.00	51.14	6.74

Table 1. Descriptive statistics calculated for the loneliness levels of high school students

Although loneliness level of both female and male students was moderate, female students (=52.33±5.82) had a higher loneliness level when compared to male students (=49.74±7.45).No significant difference was found in the loneliness level of high school students according to the year they were in $(F_{(3.653)}=1.728; p>0.05)$. No significant difference was found in the loneliness level of high school students according to the their ages $(F_{(3.653)}=2.810; p<0.05)$. Adolescents in the age group of 18-20 (=49.89±8.05) had a lower level of loneliness when compared to the adolescents in the age group of 14-15 (=52.17±6.24) $(p<0.05)$. Nevertheless, there was no significant difference between adolescents in the 14-15 years old group and 16-17 years old group and there was no significant difference between adolescents in the 18-20 years old group and 16-17 years old group adolescents; on the contrary a similarity was detected $(p>0.05)$. A significant difference was found in the loneliness level of high school students according to their school types $(X2=155.59; p<0.05)$. Based on Mann Whitney U test the loneliness level of the adolescents studying in the science high school (=52.89±4.14) was higher when compared to the adolescents in the vocational high school for health (=51.89±5.21), in imam hatip high school (=50.31±7.37) and trade vocational high school (=51.12±6.46) $(p<0.05)$. However, it was detected that there was no significant difference in loneliness levels of adolescents studying in Anatolian high school, healthcare vocational high school and trade high school; in addition to this, the loneliness levels in the adolescents studying in these schools were found to be similar $(p>0.05)$ (Table 2)

UCLA Loneliness Level Comparisons					
Variables			**n**	**X± SS**	**Test, p**	**Differences**
Socio-demographics	Gender	Female	354	52.33±5.82	*t= 5.001 p=0.000	Female>Male
		Male	303	49.74±7.45		
	School year	9th year	201	51.90±6.93	**Levene=2.539 p=0.056 ****F =1.728 p=0.160	---
		10th year	156	51.28±5.85		
		11th year	154	50.79±5.89		
		12th year	146	50.32±8.03		
	Age	14-15 years	188	52.17±6.24	** Levene= 1.697 p=0.166 ****F=2.810 p=0. 039	18-20<14-15
		16 years	159	51.08±6.55		
		17 years	204	50.89±6.49		
		18-19-20 years	106	49.89±8.05		
	School type	Science High School	113	52.89±4.14	** Levene= 7.846 p=0.000 *** X²=15.559 p=0.004	Science>Vocational high school Science>Vocational High School for Health Science>Imam Hatip High School Science>Anatolian high school
		Anatolian High School	94	49.88±9.12		
		Vocational High School for Health	122	51.89±5.21		
		Imam Hatip High School	204	50.31±7.37		
		Vocational High School	124	51.12±6.46		

Table 2. Comparison of loneliness levels of high school students according to socio-demographics

When high school students were compared based on their loneliness levels, family structures and socio-economic conditions, accommodation (t=0.378; p=0.706), family structure (t=1.702; p=0.089), the location of family dwelling (F=2.342; p=0.097), family's income level (F=1.978; p=0.139), finding pocket money/allowance sufficient (t=0.033; p=0.974) did not affect the loneliness levels of students (Table 3).

UCLA Loneliness Level Comparisons						
Variables			**N**	**X̄± SS**	**Test, p**	**Diffe-rences**
Family Structure and Socio-Economic Status	Housing	Home	604	51.08±6.89	*t= 0.378 p=0.706	---
		Student dormitory	47	51.47±4.89		
	Family structure	Nuclear family	544	51.37±6.51	*t= 1.702 p=0.089	---
		Extended family	99	50.14±7.19		
	The location of family dwelling	Town	80	52.65±6.93	**Levene=0.700 p=0.472 ***F=2.342; p=0.097	---
		City	185	50.81±7.11		
		Big city	392	50.98±6.49		
	Family's income level	Income is less than expense	56	52.71±5.69	** Levene= 0.226 p=0.798 ***F=1.978 p=0.139	---
		Income and expense balance	447	51.12±6.77		
		Income is more than expense	154	50.63±6.96		
	Whether pocket money/allowance is sufficient	Yes	508	51.13±6.86	*t= 0.033 p=0.974	---
		Partly /No	149	51.15±6.35		

*t test: Unrelated samples t test ** Levene test: Homogeneity of variance test *** F testi: One way analysis of variance

Table 3. Comparison of loneliness levels of high school students according to family structure and socio-economic status

When loneliness levels of high school students were compared based on their school success and friendships, loneliness levels were not affected by success in school (t=0.891; p=0.373), repeating of a year (t=0.568; p=0.570), relationships with teachers (t=0.831; p=0.406), relationships with friends (t=1.248; p=0.212) and having one or more close friends (t=0.060; p=0.952) (Table 4)..

UCLA Loneliness Level Comparisons						
Variables			**N**	**X̄± SS**	**Test, p**	**Differences**
School Success and Peer Relationships	Success in school	Good	229	51.41±6.05	*t= 0.891 p= 0.373	---
		Moderate	389	50.92±7.00		
	Repeating of a year	Passed	578	51.19±6.63	*t= 0.568 p=0.570	---
		Failed	79	50.73±7.52		
	Relationships with teachers	Good	380	51.31±6.28	*t= 0.831 p=0.406	---
		Moderate	251	50.85±7.45		
	Relationships with friends	Good	498	51.33±6.55	*t= 1.248 p=0.212	---
		Moderate	140	50.53±7.10		
	Having one or more close friends	Yes	623	51.13±6.74	*t= 0.060 p=0.952	---
		No	34	51.21±6.76		

*t test: Unrelated samples t test

Table 4. Comparison of loneliness levels of high school students according to school success and peer relationships

When the loneliness levels of high school students were compared based on the characteristics of their fathers and mothers; the following was found: loneliness level was not affected by the education level of the father (F=1.596; p=0.189), occupation of the father

(F=1.663; p=0.190), relationship with the father (t=0.478; p=0.633), father's attitude (F=0.079; p=0.924), mother's education level =0.965; p=0.617), relationships with the mother (t=0.219; p=0.827) and mother's attitude (F=2.045; p=0.071) and there was a significant difference according to the employment status of the mother (t(655)=2.370; p<0.05). When mean scores were examined; adolescents whose mothers worked (=52.33±6.45) had a higher level of loneliness when compared to those whose mothers did not work (=50.81±6.79) (Table 5)

UCLA Loneliness Level Comparisons						
	Variables		**n**	**$\overline{X}$± SS**	**Test, p**	**Differences**
Father Characte-ristics	Education level of the father	Elementary school or no education	167	50.81±7.18	** Levene= 2.367 p=0.070 ****F = 1.596 p=0.189	---
		Secondary school	153	50.69±6.46		
		High school	179	51.03±6.99		
		University and higher	153	52.16±5.66		
	Occupation of the father	Civil Servant	163	51.65±6.39	** Levene= 1.085p=0.339 ****F = 1.663 p=0.190	---
		Retired	100	51.99±6.04		
		Self employed	361	50.81±7.05		
	Relationship with the father	Good	524	51.20±6.57	*t= 0.478 p= 0.633	---
		Moderate	102	50.85±7.01		
	Father's attitude	Authoritarian	90	50.87±6.18	** Levene= 2.588 p=0.076 ****F = 0.079 p=0.924	---
		Democratic	69	50.86±7.74		
		Tolerant	444	51.10±6.46		
Mother Characte-ristics	Mother's education level	Elementary school or no education	295	50.95±7.16	** Levene= 3.651 p=0.012 *** X^2 = 0.965 p=0.617	---
		Secondary school	151	50.34±7.31		
		High school	137	51.55±5.60		
		University and higher	71	52.73±5.39		
	Employment status of the mother	Employed	141	52.33±6.45	*t= 2.370 **p= 0.018**	Employed> Homemaker
		Homemaker	516	50.81±6.79		
	Relationships with the mother	Good	584	51.18±6.65	*t= 0.219 p= 0.827	---
		Moderate	39	50.98±7.67		
	Mother's attitude	Authoritarian	66	50.26±7.49	** Levene= 1.251p=0.283 ****F = 2.045 p=0.071	---
		Democratic	51	51.96±8.21		
		Tolerant	503	51.15±6.34		

*t test: Unrelated samples t test ** Levene test: Homogeneity of variance test *** X^2: Kruskall Wallis test **** F testi: One way analysis of variance

Table 5. Comparison of loneliness levels of high school students according to parent characteristics

When loneliness levels of high school students were reviewed based on their Internet and telephone use for communication the following findings did not affect the mean level of loneliness among adolescents: membership to online dating sites (t=0.081; p=0.935), choosing and finding friends online (t=0.292; p=0.770), where they chose to go online (F=3.013; p=0.051), number of text messages sent via mobile phones (F=1.041; p=0.354),the purpose of using computers (=4.593; p=0.203), playing online games (t=0.754; p=0.451), the average daily hours of computer use (F=0.024; p=0.976), parents use of computers (t=0.710; p=0.478), Internet addiction (t=0.718; p=0.473); however Internet use resulting in anger/depression was found to have an effect on the mean level of loneliness in adolescents (t(655)=2.429; p<0.05).When mean scores were reviewed, the loneliness levels of adolescents who reported that being online caused them to have anger and depression (=52.64±6.30) were higher compared to those adolescents that did not report the same (=50.87±6.79) (Table 6).

UCLA Loneliness Level Comparisons						
Variables			**N**	**X± SS**	**Test, p**	**Diffe-rences**
The Use of Internet and Telephone for Communic ation	Membership to online dating sites	Yes	451	51.15±6.90	*t= 0.081 p= 0.935	---
		No	206	51.11±6.39		
	Choosing and finding friends online	Yes	31	51.48±7.53	*t= 0.292 p= 0.770	---
		No	626	51.12±6.70		
	Availability of internet to be at home	Yes	490	51.29±6.68	*t= 0.999 p=0.318	---
		No	167	50.69±6.92		
	Where they chose to go online	Home	238	50.37±7.09	** Levene= 0.810 p=0.445 ****F = 3.013 p=0.051	---
		Mobile phone	135	51.08±5.89		
		Other	284	51.81±6.77		
	Number of text messages sent via mobile phones	None	282	50.85±7.27	** Levene= 1.868 p=0.155 ****F = 1.041 p=0.354	---
		1-100	231	51.65±6.00		
		101 and over	144	50.87±6.78		
	The purpose of using computers	Only to study	113	51.78±5.43	** Levene= 3.515 p=0.015 *** X^2 = 4.593 p=0.203	---
		To study and play games	163	50.23±7.36		
		Social networks	151	51.86±6.75		
		Other	230	50.99±6.81		
	Playing online games on the Internet	Yes	390	50.97±7.03	*t= 0.754 p= 0.451	---
		No	267	51.38±6.29		
	The average daily hours of computer use	I do not use Internet	100	51.09±6.30	** Levene= 0.778 p=0.460 ****F= 0.024 p=0,976	---
		1-4 hours	501	51.13±6.67		
		5 hours and over	56	51.32±8.10		
	Parents' use of computers	Yes	378	51.30±6.58	*t= 0.710 p= 0.478	---
		No	279	50.92±6.96		
	The state of being addicted to the internet	Yes	105	51.57±6.67	*t= 0.718 p= 0.473	---
		No	552	51.06±6.75		
	Internet use resulting in anger/depression	Yes	100	52.64±6.30	*t= 2.429 **p= 0.015**	Yes>No
		No	557	50.87±6.79		

*t test: Unrelated samples t test ** Levene test: Homogeneity of variance test *** X^2: Kruskall Wallis test **** F testi: One way analysis of variance

Table 6. Comparison of loneliness levels of high school students according to the use of internet and telephone for communication

When loneliness levels of high school students were compared based on their health and the quality of life, their loneliness level was not affected by the following medical condition (t=0.377; p=0.706), chronic illness (t=0.368; p=0.713), ability to enjoy life (t=0.124; p=0.901), future expectations (F=0.159; p=0.853), tobacco, alcohol or drug use (t=1.315; p=0.189) and self-hurt act within the last year (t=0.357; p=0.721) however it was affected by self-harm thought/urges occurring in the last one year (t(655)=3.043; p<0.05).When mean scores were reviewed, the loneliness level of adolescents who had self-harm urges in the last year (=53.10±5.36) was higher when compared to those adolescents that did not have any self-harm thoughts in the last year(=50.82±6.89) (Table 7).

UCLA Loneliness Level Comparisons						
Variables			n	X± SS	Test, p	**Differences**
Health and Life Expectations	Medical condition (to be handicapped)	Yes	46	51.50±6.06	*t= 0.377 p=0.706	---
		No	611	51.11±6.79		
	Chronic illness	Yes	53	50.81±6.25	*t= 0.368 p=0.713	---
		No	604	51.17±6.78		
	Ability to enjoy life	Yes	505	51.16±6.72	*t= 0.124 p=0.901	---
		No	152	51.08±6.81		
	Future expectations	I believe all my expectations will realise	196	51.23±7.14	**Levene=0.147 p=0.863 ***F = 0.159 p=0.853	---
		I believe some of my expectations will realise	415	51.05±6.57		
		I don't believe any of my expectations will realise	46	51.59±6.59		
	Tobacco, alcohol or drug use	Yes	57	50.02±5.79	*t= 1.315 p=0.189	---
		No	600	51.25±6.82		
	Self-harm thought/urges the last year	Yes	93	53.10±5.36	*t= 3.043 **p=0.002**	Yes>No
		No	564	50.82±6.89		
	Self-hurt act within the last year	Yes	27	51.59±6.63	*t= 0.357 p=0.721	---
		No	630	51.12±6.75		

*t test: Unrelated samples t test ** Levene test: Homogeneity of variance test *** F testi: One way analysis of variance

Table 7. Comparison of loneliness levels of high school students according to health and life expectations

Discussion

The mean score of the high school students in the UCLA Loneliness Scale was 51.14±6.74 which was evaluated as moderate level. When the literature was reviewed, similar loneliness scores were found in the studies conducted in adolescents and these scores ranged between 34.47 and 66.22 [5, 21, 24, 28, 33, 42]. The findings of our study were similar to the findings of other studies and the levels were too high to be ignored. The reason why the range of loneliness levels is that wide can be explained by the use of non-standard scales and also by the fact that the socio-demographic factors such as age, gender, geographic location, culture etc. in study groups are different from each other. The fact that we conducted this study in the country side could be the reason for these findings. In fact in their study conducted to determine loneliness levels and coping strategies of adolescents in the country side, Woodward and Frank [38] found extremely high loneliness scores in adolescents.

Although loneliness level of both female and male students was moderate, female students had a higher loneliness level when compared to male students. When similar studies in the literature were reviewed there were studies with findings that match our study findings [20, 26, 33, 41] and there were studies that reported higher level of loneliness among male students vs female students [1, 4-6, 8, 14, 19, 21, 30, 31, 35]. Additionally there are also studies which reported no significant difference between the levels of male and female students [15, 36, 37]. In the literature review, there are findings that are both compatible and not compatible with the findings of our study. The reason for female participants to have a higher level of loneliness might be that women may be restricted more compared to men for their freedoms to go outside, to meet friends due to patriarchal structure of our society. Considering the fact that the study was conducted in the Black Sea region, a conservative region in Turkey, families may be too protective for their daughters and since being more sensitive to any possible dangers in the outside world, they may be raising their daughters to be more insecure. This could lead to the situation where girls

become more sensitive and hesitant in having close relationships and establishing trust to others.

In this study, it was found that younger high school students had higher level of loneliness. In their studies in adolescents, Erözkan [15] and Çağır [6] did not find any significant difference in the loneliness levels of students based on the age variable. In their study with nursing and midwifery students Kaya et al. [21] found that the level of loneliness of students increased with the increasing age. In their study in 156 adolescents with ages ranging from 11 to 18, Brage et al. [3] found that older adolescents felt lonelier compared to younger adolescents. In their study in adolescents, Seçim et al. [33] found that loneliness score increased with the increasing age. In the above mentioned studies loneliness levels increased with the increasing age while in this study loneliness decreased with the increasing age. The reason why the findings of this study are not similar to those in the literature could be the geographic location of the study, social structure, cultural factors involved and gender. Younger adolescents could be more independent, defiant, and engage in risky behaviour when selecting friends. Therefore they could have more friends around them and have more satisfactory relationships.

Adolescents studying in the science high school had a higher level of loneliness when compared to the loneliness levels of adolescents in other schools. In the study conducted in adolescents, Şentürk [35] reported that students in vocational high schools had the highest level of loneliness according to school type. The findings of this study are not compatible to the findings of Şentürk's study. That the students in the Science High School which is one of the best schools where only the smartest students can enter after passing a nationwide exam are more success oriented and study all the time could be reason for this result. Because these adolescents are most probably very success oriented and spend most of their time studying.

Loneliness levels of high school students showed a significant difference depending on the employment status of their mothers. Adolescents whose mothers worked had a higher level of loneliness when compared to those whose mothers did not work. Adolescents

typically need more relationships due to the developmental stage they are in and this need for relationship is generally met by friends and family members. In our culture a mother is typically the first person with whom the adolescent shares his /her problems. While the mother is the confidant half-friend, main care-giver and listener in the family; the father mostly stands out as the family member who provides for and protects the family, an authority figure. Not being able to share problems with the mother due to the reason that she is working could be the reason why the adolescents feels lonelier.

Loneliness levels of high school students showed a significant difference depending on their use of Internet leading to anger or depression. When mean scores were reviewed, the loneliness levels of adolescents who reported that being online caused them to have anger and depression were higher compared to those adolescents that do not report the same. No study on this subject has been found in the literature. Increased amount of time spent online by the adolescent leading to anger and depression and thus resulting in loneliness was an anticipated finding. The fact that an adolescent does not communicate outside the virtual network and online chat environment could lead them to loneliness. Additionally if the adolescent plays violent online games, this could also make him/her feel angry and depressive.

A significant difference was found in the level of loneliness among high school students based on their self-harm thoughts in the last year. When mean scores were reviewed, the loneliness level of adolescents who had self-harm urges in the last year was higher when compared to those adolescents that did not have any self-harm thoughts. Eskin [17] also found that the UCLA loneliness scores of the adolescents who "thought of committing a suicide in the last year" were higher than those who did not have such thoughts. Similarly, loneliness scores of the adolescents who attempted a suicide attempt was higher than those who did not. The literature shows a relationship between loneliness and depression symptoms. Considering the fact that depression has a high risk of resulting in a suicide attempt or thought of suicide attempt, high level of

loneliness was an anticipated finding. Additionally, availability of social support systems for adolescents is one of the factors of that protect mental health. Social support and the perception of social support are among the factors that affect the feeling of loneliness. However in this study loneliness increased as the age of the adolescent decreased. Younger adolescents may tend to engage more in impulsive behaviour additionally adolescents may be more depressive when they feel lonely. And this could lead to thoughts of suicide.

No significant difference was found in the level of loneliness of high school students according to the number of their siblings. In other words, adolescents with one or more siblings showed similar levels of loneliness. Different findings could be seen in studies conducted in similar groups. While there are studies that reported that loneliness increased as the number of siblings increased [5, 14, 30, 42], there are also studies that reported that loneliness decreased as the number of siblings increased [36]. Seçim et al. [33] reported that loneliness scores were higher in only children and those who had two siblings. The reason why our study findings are not compatible with the findings of other studies could be the geographic characteristics of the study area. The Black Sea region is one of the regions where adolescents are important members of their families, traditional values are still maintained and gender discrimination is not too common. The difference in findings was thought to have resulted from the above facts.

Loneliness levels of high school students were not affected by their parents' education level. In the literature review, study findings were varied in this subject. Some studies reported that loneliness levels of high school students were not affected by the mother's education level [36] and some studies reported that they were affected both by the mother's and father's education level [17] and some studies reported that loneliness increased as the father's education decreased [36] and some claimed that loneliness increased as the education of both the mother and father decreased [5, 14, 17, 24, 35, 42]. As most of literature findings show, the loneliness level of the adolescent decreases when the education level of parents increases. This study demonstrated that education level of the mother and father did not affect the level of loneliness.

Conclusion and Recommendation

The study found that adolescents had a moderate level of loneliness, and the factors including being female, having a working mother, internet use resulting in anger/depression and thoughts of self-harm in the last year led to a higher loneliness score.

Based on the above mentioned findings, it is recommended for school nurses to increase social activities in schools, to educate to spend more time to the adolescents whose mothers are working, to identify risk groups for loneliness to prevent suicides, to organise programs to increase social relations and to make regular presentations on effective communication techniques.

Conflict of Interest: The authors declare that they have no competing interests.

Authors' contributions
K.Ö.: Data collection, data analysis, and completing the paper.
H. A.: Study design, data analysis, and drafting and completing the paper.

Limitations of Study
The research is limited with five schools.

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