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Internet addiction and psychosocial problems among adolescents during the COVID-19 pandemic: A cross-sectional study

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ABSTRACT

Purpose: This research was conducted to investigate the prevalence of internet addiction and psychosocial problems and associated factors among adolescents during the COVID-19 pandemic.
Design and methods: A cross-sectional study was conducted in Turkey. The population was composed of 9th and 10th grade students. The sample consisted of 1572 participants. Data were collected from parents of the students through a questionnaire, the Pediatric Symptom Checklist, and the Parent-Child Internet Addiction Test.
Results: The prevalence of psychosocial problems was 20.7%. A few (4.8%) of adolescents had limited internet addiction symptoms. The psychosocial problems risk was significantly higher in adolescents whose fathers did not work, whose family income was less than expense, and whose daily internet use time was more than 3 h and more ($p < 0.05$). The risk of problematic internet use was significantly higher in males, whose mother's education level was high school and lower, whose family income was less than expense, and whose duration of internet use was 5 years and more ($p < 0.05$). There was a positive correlation between internet addiction and psychosocial problem mean scores ($p < 0.05$).
Conclusion: Most of the adolescents were internet users and one in five adolescents was at risk of psychosocial problems. Internet addiction and psychosocial problems were associated with several sociodemographic factors.
Practice implications: This study emphasizes the need for the prevention of excessive internet use and psychosocial problems during COVID-19 pandemic among adolescents. Nurses should organize online trainings for internet addiction and psychosocial problems for adolescents and their parents during the quarantine process.

Introduction

COVID-19 pandemic has and continues to deeply affect all age groups physiologically, psychologically, and socially by creating a crisis effect in society (Lin, 2020). In more than 130 countries around the world, restrictions were imposed to prevent the spread of COVID-19 with the closure of schools. Adolescents remained quaranteed from their social environment, school, physical activity, and hobbies (Faltýnková, Blinka, Ševčíková, & Husarova, 2020; Lin, 2020). As in many countries, all schools in Turkey were closed and distance education instituted. Pandemic control measures such as a long break from formal education and home isolation negatively affected the psychosocial status of adolescents while internet use increased considerably (Guessoum et al., 2020; Lin, 2020).

Internet addiction is defined as a social problem with symptoms such as excessive occupation with the internet, the feeling of needing to use the internet, repeated efforts to stop using the internet, the loss of importance of time spent away from the internet, spending more time on the internet than planned, and extreme uneasiness when staying away from the internet (Young, 2004). During the pandemic, adolescents commonly used the internet for different purposes such as establishing social communication, playing computer games, doing homework, and obtaining information on various subjects, in addition to participating in distance education (Dong, Yang, Lu, & Hao, 2020). The average daily time spent on the internet during the pandemic has increased compared to the pre-pandemic period, which has increased the risk of internet addiction in adolescents (Duan et al., 2020; Faltýnková et al., 2020; Lin, 2020). In a meta-analysis study conducted before the COVID-19 pandemic, 13.6% of adolescents were internet addicted (Fumero, Marrero, Voltes, & Penate, 2018), while in a study conducted during the COVID-19 pandemic, 24.4% of adolescents were internet addicts (Lin, 2020). In addition, a study conducted in China revealed that the

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frequency and duration of recreational internet use among adolescents increased during the COVID-19 pandemic (Dong et al., 2020).

Quarantine practices and increasing internet use in the pandemic are associated with psychosocial problems (Guessoum et al., 2020; Taş, 2018; Zhou et al., 2020). Psychosocial problems such as anxiety, depression, hostility, suicidal behaviors, hyperactivity, inattention, aggression, and stress are more common with increased internet use (Dong et al., 2020; Fumero et al., 2018; Guessoum et al., 2020; Obeid et al., 2019). A study conducted with adolescents in Lebanon found that as the level of internet addiction increased, the level of aggression, depression, and impulsivity also increased. (Obeid et al., 2019). In addition, in a study conducted with 11,356 adolescents in 11 countries in Europe, behavioral problems, suicidal behavior, hyperactivity, inattention, deterioration in peer relationships, depression, and anxiety were psychosocial behavioral disorders that predicted internet addiction (Kaess et al., 2014).

Adolescents should be protected from harmful effects of the internet to maintain their physical and psychosocial health (Işik & Ayaz Alkaya, 2017). Nurses support adolescents in coping with their psychosocial problems. Nurses can prevent the occurrence of risky behaviors by giving health education to adolescents on issues such as internet addiction, substance abuse, and smoking (Skundberg-Kletthagen & Moen, 2017). In addition, psychosocial problems of adolescents such as anxiety, depression, hostility, suicidal behaviors, hyperactivity, inattention, aggression and stress, and health needs can be identified in the early period and nurses can provide counseling (Kivimäki et al., 2019).

Several studies have been conducted before the pandemic regarding the internet use and psychosocial problems experienced by adolescents in Turkey (Avşar & Ayaz-Alkaya, 2021; Işik & Ayaz Alkaya, 2017; Kaya & Dalgiç, 2021; Kısa & Karşıdağ, 2021). However, a gap exists in the literature regarding whether there is a relationship between the development of internet addiction and psychosocial problems due to increased internet use and quarantine measures in adolescents during COVID-19 pandemic. In addition, evidence was lacking whether the sociodemografic factors associated with internet addiction and psychosocial problems differ from pre-pandemic. During the pandemic process, it is thought that adolescents who spend most of their time at home due to quarantine measures such as distance education and curfews may experience changes in the situation of internet use and psychosocial problems. Therefore, it has become important to investigate the changes that occur in adolescents during COVID-19 pandemic. This study can contribute to identifying changes in adolescents and planning of interventions to prevent internet addiction and psychosocial problems of adolescents during and after the pandemic.

This research was conducted to investigate internet addiction and psychosocial problems among adolescents during the COVID-19 pandemic. The research questions were:

During the COVID-19 pandemic,

- What is the prevalence of internet addiction among adolescents?
- What is the daily internet use time of adolescents?
- What is the prevalence of psychosocial problems in adolescents?
- Is there any association between sociodemographic factors and psychosocial problems?
- Is there any association between sociodemographic factors and internet addiction?
- Is there any relationship between psychosocial problem risk and internet addiction?

Method

Design and participants

This cross-sectional study was performed with adolescents between 13 and 16 years of age. This study was carried out in Ankara, the capital city of the country with the second largest population. Since all public high schools receive the same amount of funding from the government, no socioeconomic categorization was made between the schools. Therefore, three districts were randomly selected from 25 districts in Ankara. Two state high schools were randomly selected from each of the three districts. The population of the study consisted of 3836 students in the 9th and 10th grade in six state high schools in Ankara in the academic year of 2020–2021. A priori power analysis was conducted in G*Power Software (v3.1.9.5; Franz Faul, Universität Kiel, Germany). The sample size calculation was based on the proportion of internet addicts derived from previous research (Fumero et al., 2018) and an alpha significance level set at 0.05, to achieve a 95% statistical power approximately 747 individuals would have to be recruited. Totally, 1572 students who met the inclusion criteria were included in the study.

Inclusion criteria of the study were: 1) being a 9th or 10th grade student. The exclusion criteria for the study were: 1) having visual-hearing impairment, and 2) being diagnosed with any neuro-psychiatric disease.

Instruments

Data were collected through a questionnaire, the Pediatric Symptom Checklist (PSC-17), and the Parent-Child Internet Addiction Test (PCIAT-20).

The questionnaire consisted of closed-ended questions that can only be answered by selecting from a limited number of options, usually multiple-choice, ‘yes’ or ‘no’. The questions related to sociodemographic factors such as the child's age, class, gender, parental educational status, parental employment status, family income, having a chronic illness, and questions related to internet use such as daily internet use time, duration of internet use. For example, the questions related to the internet use were: “How long your child has been using the internet? (options: 1-2 years, 3-4 years, 5 years and over)”, “How long time does your child use the internet in a day? (options: Less than 2 hours, 3 hours and more)”.

The PSC-17 was developed by Gardner and Kelleher in 1999. The PSC-17 is used for early diagnosis of psychosocial problems in childhood (6–16 years) by enabling parents to evaluate the behaviors of their children. It examines the characteristics of childhood for attention, disturbing behavior, and assimilation (depression and anxiety) (Gardner et al., 1999). All items of the PSC-17 scale are positive. Points for each items are collected (not true/never = 0, sometimes or little true = 1, very often, or often = 2). The highest score to be obtained from the scale is 34 and the lowest one being 0 (Gardner et al., 1999). The Turkish validity and reliability of the scale was performed by Erdogan and Ozturk and the Croncbach α value was found to be 0.81. A total score of 12 and above indicates a psychosocial problem (Erdogan & Ozturk, 2011). In this study, the Cronbach alpha value was found to be 0.81.

The PCIAT-20 was developed by Young (1998) for families to evaluate their children for internet addiction. The Turkish validity and reliability study of PCIAT-20 was performed by Eşgi (2014). The scale consists of 20 items and has four sub-factors: “Social isolation”, “Dysfunction”, “Deprivation”, and “Difficulty in control”. The PCIAT-20 is a six-point Likert-type structure and scored as “Not suitable (0 points)”, “Rarely (1 point)”, “Occasionally (2 points)”, “Mostly (3 points)”, “Frequently (4 points)”, and “Continuously (5 points)”. Scores of 80 and above on the scale are defined as “Internet addicts”, those between 50 and 79 points as “those with limited symptoms”, and those who score 49 and below as “those who show no symptoms” (Eşgi, 2014). The construct validity of the scale was examined with the Basic Components (Extraction Method: Principal Components). Kaiser-Meyer Olkin (KMO) and Bartlett tests was found to be significant ($p < 0.001$), reporting that the data set was suitable for principal component analysis and the sample size was sufficient. The significance of the Bartlett Test in the confirmatory factor analysis (Chi-square = 1250.52, SD = 464) supports the factor analysis. Within the scope of the reliability study of the PCIAT-20, the Cronbach alpha reliability coefficient was

calculated as 0.91 for the whole scale. The Spearman-Brown value of the scale was found to be 0.89 (Eşgi, 2014). In this study, the Cronbach alpha value was found to be 0.93.

Data collection

The data were collected between December 2020 and January 2021. Before data collection, school administration and teachers were informed about the research. Instruments were prepared online with Google Forms. The PSC-17 and PCIAT-20, which are used to determine the risk of psychosocial problems and internet addiction of adolescents, should be filled out by parents. Therefore, parents were invited to participate in the study by sending the informed consent form and questionnaire link to parents through school administrators and teachers. Families who approved the informed consent form were also asked to complete the instruments. During the data collection, contact was made with the school administrators once a week, information was received about the sharing of the questionnaire link to the parents, and reminder messages were sent to the parents. The completion of online forms lasted approximately 10–15 min.

Ethical consideration

Ethics committee approval (Date: 30/11/2020, Number: 17/263), institutional permission, and informed consent from parents were obtained for the study. An informed consent form was added as the first page of the online questionnaire. Parents completed the instruments after approving the informed consent form.

Data analysis

Data analysis was performed using SPSS 15.0 (Statistical Package for the Social Sciences, Chicago, Illinois). Data were collected via Google forms online. While preparing all the questions in the online survey, the "required" button was activated for each question and data loss was prevented. Categorical variables were presented as frequencies and percentages. Continuous variables were expressed as mean and standard deviation (SD). The Kolmogorov-Smirnov test was used for evaluating the normality of the data distribution. In this study, because there were 9 adolescents with a score of 80 and above, two categories were used as "those with limited symptoms" and "those with no symptoms". Univariate and multivariable logistic regression was performed with a dichotomous dependent variable PCS-17 and PCIAT-20. Independent variables that were significant in the univariate logistic regression analysis ($p < 0.05$) were included in the multivariable logistic regression analysis. Pearson correlation analysis was used to determine the correlation between internet addiction and psychosocial problem scores of adolescents. A significance level was accepted as 0.05.

Results

Of the students, 828 (52.7%) were 9th grade, 1004 (63.9%) were female,740 (47.1%) were aged 13–14 years, 596 (37.9%) had a high school graduated mother, 643 (40.9%) had a high school graduated father, 460 (29.3%) had a working mother, 1403 (89.2) had a working father, 132 (8.4%) had a chronic disease (Table 1). Almost all adolescents (99.7%) were using the internet, 1463 (93.1%) had more than 3–4 h of daily internet use, and 516 (32.8%) had been using the internet for more than 5 years (Table 2). According to the scales, the research showed that 326 (20.7%) of the students had psychosocial problems risk, 9 (0.6%) had internet addiction and 75 (4.8%) had limited internet addiction symptoms.

Factors associated with problematic internet use risk

The risk factors of problematic internet use were assessed by multiple logistic regression analysis. As shown in Table 3, males were more likely to have problematic internet use risk than females (OR = 1.88, 95% CI: 1.19–2.96, $p = 0.007$). Adolescents whose mother had a degree of baccalaureate and over were more likely to have a problematic internet use risk (OR = 2.40, 95% CI: 1.32–4.36, $p = 0.004$), whose family income was less than the expense (OR = 3.41, 95% CI: 1.53–7.64, $p = 0.003$) were more likely to have a problematic internet use risk. Adolescents who have chronic illness were more likely to have problematic internet use risk than those without chronic illness (OR = 2.12, 95% CI: 1.13–3.94, $p = 0.018$). Adolescents who use the internet 5 years and over (OR = 2.04, 95% CI: 1.09–3.81, $p = 0.025$) were more likely to have a problematic internet use risk. Also, it was found that the adolescent's age, class, father's education and working status, mother's working status, or daily internet use time were not associated with the risk of problematic internet use risk (Table 3).

Table 1
Descriptive characteristics of the students ($n = 1572$).

Descriptive characteristics	Number	Percentage
Class		
9th grade	828	52.7
10th grade	744	47.3
Gender		
Female	1004	63.9
Male	568	36.1
Age		
13	110	7.0
14	630	40.1
15	714	45.4
16	118	7.5
Mother's education level		
Primary school	429	27.3
Secondary school	253	16.1
High school	596	37.9
Baccalaureate and over	294	18.7
Father's education level		
Primary school	237	15.1
Secondary school	258	16.4
High school	643	40.9
Baccalaureate and over	434	27.6
Mother's working status		
Working	460	29.3
Not working	1112	70.7
Father's working status		
Working	1403	89.2
Not working	169	10.8
Family income		
Expense > income	300	19.1
Expense is equal to income	1058	67.3
Expense < income	214	13.6
Having chronic illness		
Yes	132	8.4
No	1440	91.6

Table 2
Characteristics of the students related to internet use (n = 1572).

Characteristics related to internet use	Number	Percentage
Internet use		
Yes	1567	99.7
No	5	0.3
Daily internet use time		
Less than 2 h	109	6.9
3 h and more	1463	93.1
Duration of internet use		
For 1–2 years	488	31.0
For 3–4 years	568	36.1
More than 5 years	516	32.8
Internet addiction		
Non-addicted	1488	94.7
Limited symptoms	75	4.8
Addicted	9	0.6

Table 3
Factors associated with problematic internet use risk (n = 1572).

Variables	n_1	n_2	Univarite analysis			Multivariable analysis		
			OR	95% CI	p	OR	95% CI	p
Age (year)						–		
13–14	699	41	1					
15–16	789	43	0.92	0.59–1.14	0.743			
Gender								
Female	965	39	1			1		
Male	523	45	2.12	1.36–3.31	0.001	1.88	1.19–2.96	0.007
Class						–		
9th grade	781	47	1.15	0.73–1.79	0.536			
10th grade	707	37	1					
Father's education level						–		
Primary/secondary school	474	21	1					
High school	602	41	1.53	0.89–2.63	0.118			
Baccalaureate and over	412	22	1.20	0.65–2.22	0.550			
Mother's education level								
Primary/secondary school	655	27	1			1		
High school	563	33	1.42	0.84–2.39	0.185	1.35	0.78–2.31	0.273
Baccalaureate and over	270	24	2.15	1.22–3.80	0.008	2.40	1.32–4.36	0.004
Father's working status						–		
Working	1329	74	0.88	0.44–1.74	0.726			
Not working	159	10	1					
Mother's working status						–		
Working	430	30	1.36	0.86–2.16	0.183			
Not working	1058	54	1					
Family income								
Expense > income	272	28	2.34	1.08–5.07	0.031	3.41	1.53–7.64	0.003
Expense is equal to income	1011	47	1.05	0.51–2.19	0.878	1.20	0.58–2.52	0.626
Expense < income	205	9	1			1		
Having chronic illness								
Yes	118	14	2.32	1.26–4.24	0.006	2.12	1.13–3.94	0.018
No	1370	70	1			1		
Duration of internet use								
1–2 years	471	17	1			1		
3–4 years	537	31	1.59	0.87–2.92	0.128	1.55	0.82–2.88	0.173
5 years and over	480	36	2.07	1.15–3.75	0.015	2.04	1.09–3.81	0.025
Daily internet use time								
Less than 2 h	108	4	1			-		
3 h and more	1380	80	1.57	0.58–4.35	0.391			

OR = Odds Ratio, CI = Confidence Interval.
n_1: No problematic internet use risk.
n_2: Problematic internet use risk.

Factors associated with psychosocial problem risk

The risk factors for psychosocial problems were assessed by multiple logistic regression analysis. As shown in Table 4, adolescents whose father had a degree of baccalaureate and over were more likely to have a psychosocial problem risk (OR = 0.69, 95% CI: 0.49–0.97, $p = 0.032$). Adolescents who had a "not working father" were more likely to have a psychosocial problem risk than children who had a "working father" (OR = 1.48, 95% CI: 1.02–2.14, $p = 0.041$). Adolescents whose family income were less than the expense (OR = 1.78, 95% CI: 1.13–2.79, $p = 0.013$) were more likely to have a psychosocial problem risk. Adolescents who used the internet for 3 h and more per day (OR = 2.25, 95% CI: 1.70–2.97, $p < 0.001$) were more likely to have a psychosocial problem risk than who used the internet less than 2 h per day. Also, it was found that the adolescent's age, gender, class, mother's education and working status, having a chronic disease, and duration of internet use were not associated with the psychosocial problems risk ($p > 0.05$) (Table 4).Not shown in table, a medium positive correlation was found between the PSC-17 and the PCIAT-20 scores ($r = 0.482$; $p < 0.001$).

Discussion

Internet addiction and psychosocial problems can become common problems for society, especially adolescents, during the COVID-19 pandemic. This lockdown during the pandemic has disrupted daily routines (Lin, 2020). The current study sought to examine the risk of internet addiction and psychosocial problems in adolescents during the pandemic.

Internet addiction can cause serious problems by negatively affecting the physical, cognitive, and psychosocial development of adolescents (Chung, Sum, & Chan, 2019; Lo, Lai, Ng, & Wang, 2020). In this study, it was determined that almost all adolescents use the internet, but the majority of them did not develop internet addiction. Adolescents used the internet for long periods of time within the scope of quarantine measures taken due to the COVID-19 pandemic, as face-to-face education was interrupted in schools and lessons were conducted by distance education. It is thought that adolescents spent more time on the internet due to the requirements of online classes. In addition, these adolescents had curfews and were restricted to their homes. Social interaction with face-to-face communication with their friends was conducted online instead of in person, increasing their internet use.

Internet addiction occurs when an individual spends much more time on the internet than is considered reasonable (Kaya & Dalgiç, 2021). The risk of excessive internet use turning into internet addiction increases in children and adolescents (Busch & De Leeuw, 2014; Işik & Ayaz Alkaya, 2017; Kurniasanti, Assandi, Ismail, Nasrun, & Wiguna, 2019). Several studies conducted before the pandemic in Turkey were reported to be less than 3 h daily internet use time of the majority of adolescents (Avşar & Ayaz-Alkaya, 2021; Işik & Ayaz Alkaya, 2017; Kısa & Karşıdağ, 2021). In the current study, it was found that the majority of adolescents used the internet for 3 h or more a day. This finding shows that daily internet use time of the adolescents is increasing during

Table 4
Factors associated with psychosocial problem risk (n = 1572).

Variables	n_1	n_2	Univarite analysis			Multivariable analysis		
			OR	95% CI	p	OR	95% CI	p
Age (year)						–		
13–14	592	148	1					
15–16	654	178	1.08	0.85–1.39	0.496			
Gender						–		
Female	793	211	1					
Male	453	115	0.95	0.73–1.23	0.718			
Class						–		
9th grade	667	161	1					
10th grade	579	165	0.84	0.66–1.08	0.182			
Father's education level								
Primary/secondary school	381	114	1			1		
High school	503	140	0.93	0.70–1.23	0.614	0.98	0.73–1.30	0.976
Baccalaureate and over	362	72	067	0.48–0.92	0.015	0.69	0.49–0.97	0.032
Mother's education level						–		
Primary /secondary school	534	148	1					
High school	477	119	0.90	0.69–1.180	0.447			
Baccalaureate and over	235	59	0.91	0.65–1.27	0.567			
Father's working status								
Working	1127	276	1			1		
Not working	119	50	1.71	1.20–2.44	0.003	1.48	1.02–2.14	0.041
Mother's working status						–		
Working	369	91	1					
Not working	877	235	1.08	0.82–1.42	0.548			
Family income								
Expense > income	211	89	2.01	1.31–3.10	0.001	1.78	1.13–2.79	0.013
Expense is equal to income	858	200	1.11	0.75–1.64	0.580	1.08	0.73–1.60	0.699
Expense < income	177	37	1			1		
Having chronic illness								
Yes	99	33	1.30	0.86–1.97	0.208	–		
No	1147	293	1					
Duration of internet use								
1–2 years	387	101	1			–		
3–4 years	449	119	1.02	0.75–1.37	0.919			
5 years and over	410	106	1.03	0.73–1.35	0.852			
Daily internet use time								
Less than 2 h	96	13	1			1		
3 h and more	1150	313	2.15	1.63–2.82	<0.001	2.25	1.70–2.97	<0.001

OR = Odds Ratio, CI = Confidence Interval.
n_1: No psychosocial problem risk.
n_2: Psychosocial problem risk.

COVID-19 pandemic. It is thought that the risk of addiction may increase in adolescents. In a study conducted with adolescents, it is stated that establishing good relationships with family and friends can be a preventive factor for internet addiction (Kaya & Dalgiç, 2021). For healthy development, the American Academy of Child and Adolescent Psychiatry (2020) recommends that adolescents spend most of their time on activities such as sleeping, doing homework, reading books for fun, building social and family connections, physical activities and housework, rather than spending their time online or in front of the screen. In this context, it is important for parents to limit and control their children's internet usage time to prevent internet addiction in adolescents (Martins et al., 2020). A study conducted in Portugal found that adolescents without parental control were more likely to become internet addicts (Martins et al., 2020). In addition, Uysal and Balci (2018) reported that the Healthy Internet Use Program is effective in reducing internet addiction among adolescents. It is important to implement educational programs for adolescents and parents on conscious and controlled internet use.

Several studies reported that gender is a risk factor for internet addiction (Chung et al., 2019; Dong et al., 2020; Fumero et al., 2018; Martins et al., 2020). In this study, it was determined that gender is a risk factor for problematic internet users as male students were 1.9 times more likely to exhibit problematic internet behaviors than female students. The gender difference in problematic internet use can often be explained by the different personality patterns of girls and boys and the purpose of internet use. It is stated that girls' being better in self-control and emotional regulation, and their biopsychosocial maturation earlier may reduce the tendency to internet addiction (Dong et al., 2020). It is stated that men use the internet mostly for discovering new inventions, cyber sex, pornography and online games, and because they cannot control time in this process, they are more prone to problematic internet use (Islam & Hossin, 2016).

Another demographic factor that has a significant impact on the problematic internet use is socioeconomic level (Chung et al., 2019; Lai & Kwan, 2017). In this study, adolescents whose family income were less than expense were at a 3.4 times higher risk for problematic internet use. Similarly, it has been reported in the literature that there is a significant relationship between low socioeconomic status and the risk of problematic internet use (Islam & Hossin, 2016; Lee & McKenzie, 2015) and that high socioeconomic level is a protective factor for problematic internet use (Faltýnková et al., 2020). It is thought that parents with high income spend quality time with their children and give their children basic information about conscious internet use.

Another factor that has a significant impact on the risk of problematic internet use is the level of parental education. It is stated that the high education level of parents is a protective factor against internet addiction (Chung et al., 2019). On the contrary, in the present study, adolescents whose mothers have a bachelor's degree and over were 2.4 times more likely to have a risk of problematic internet than adolescents whose mothers have a lower education level. Mothers with a bachelor's degree may be more likely to have a profession and work in a job. For this reason, it is thought that mothers with undergraduate degrees may

be busy due to their responsibilities related to housework, occupational and child care during the pandemic, and their children may have turned to the internet more because they cannot spare enough time for their children.

Adolescents with chronic conditions are engaged to the same extent or even more in health-risk behavior compared with their healthy counterparts (Jin, An, & Wang, 2017). In this study, adolescents with chronic illness were at a 2.1 times higher risk for problematic internet use. This result suggests that the family of an adolescent with a chronic disease may adopt a protective approach, allowing the adolescent to do whatever they want and use the internet as much as they want. Thus, the adolescents can take shelter behind their chronic illness, cannot be limited by their family for internet use, and can have secondary earnings.

Increased internet use during the COVID-19 pandemic is associated with psychosocial problems (Guessoum et al., 2020; Zhou et al., 2020). The current study found that there is a risk of psychosocial problems in one out of every five adolescents (20.7%). Several studies conducted before COVID-19 pandemic in Turkey (Avşar & Ayaz-Alkaya, 2021; Işik & Ayaz Alkaya, 2017), revealed that psychosocial problems risk in the adolescents were found as 19.8% and 18.8%, respectively. When compared with these studies, this study showed that there is a slight increase in the risk of psychosocial problems in adolescents. This increase may be due to quarantine measures, curfews, and closures of schools due to the COVID-19 pandemic. In a study conducted in Germany, it was reported that two-thirds of adolescents are under the burden of the COVID-19 pandemic and they experienced higher anxiety and more mental health problems than before the pandemic (Ravens-Sieberer et al., 2021). It is stated that the COVID-19 pandemic in adolescents is a risky period for psychosocial problems such as post-traumatic stress syndrome, sleep disorders, depression, anxiety, loneliness, social isolation, suicidal behavior, substance use, and domestic violence (Guessoum et al., 2020; Seçer & Ulaş, 2020; Zhou et al., 2020). Formal education routine is the main coping mechanism for adolescents' mental health. Adolescents have been deprived of both school and leisure activities, and also from their peer group from which they would have usually received support in coping with problems (Kılınçel, Kılınçel, Muratdağı, Aydın, & Usta, 2020). The decrease in peer interaction and peer support, being more lonely, the uncertainty and anxiety caused by the pandemic, and the fear of getting sick may have led to an increase in psychosocial problems in adolescents during this period. Especially during this period, effective communication of parents with their children is beneficial for the psychosocial health of adolescents (Kılınçel et al., 2020).

The present study determined that family income, father's work, and education level are risk factors for psychosocial problems. Adolescents whose family income level is low, whose fathers are unemployed and, whose fathers have a high education level were at a higher risk for psychosocial problems. The decrease in income level due to the dismissal of many people during the pandemic process and the increase of concerns about meeting the basic needs of adolescents may have impaired the psychosocial health of adolescents. Ravens-Sieberer et al. (2021) reported that the psychosocial health of adolescents with a low socioeconomic level was affected more negatively during the pandemic. The adolescents with a higher education level of fathers can be at higher risk for psychosocial problems because their fathers may work in jobs that require more responsibility and over time, result in spending less and unqualified time with their children, and this may lead to psychosocial problems.

The examination of extensive use of the internet among adolescents is important for the determination of psychosocial health (Guessoum et al., 2020). In the present study, it was found that as the risk of internet addiction increases in adolescents, the risk of psychosocial problems also increases. These findings can be explained by the adolescents staying home due to the constraints in the COVID-19 pandemic. Adolescence is the identity formation period in which the need to express feelings and thoughts is felt the most (Ravens-Sieberer et al., 2021). Due to the curfew restrictions during the pandemic process, it is thought that adolescents meet their basic psychosocial needs such as love, belonging, security and dignity in the internet environment, thus they may become a risk group for internet addiction and psychosocial problems. Dong et al. (2020) reported that psychosocial problems such as stress, anxiety, and depression during the pandemic are also a risk factor for internet addiction. Providing parents with online seminars and tele-consultation for the early diagnosis of internet addiction and psychosocial problems risk in adolescents are important in protecting and improving adolescent health.

Practice implications

Measures in the COVID-19 pandemic process restricted the freedom of adolescents, obliged them to distance education, increased their internet use and affected their psychology. This study emphasizes the need for the prevention of excessive internet use and psychosocial problems during COVID-19 pandemic among adolescents. Nurses should organize periodic online trainings for internet addiction, psychosocial problems and symptoms for adolescents and their parents during the quarantine process. Within the normalization process in most countries of the world, schools have begun to open for face-to-face education. School nurses, teachers, and parents should cooperate in order to prevent internet addiction and psychosocial problems in adolescents in the face-to-face education process that starts with normalization. In addition, informative infographics, posters, brochures and mobile applications can be developed for adolescents on conscious internet use and psychosocial health at national and global level.

Limitations

The current study has some limitations. First of all, the findings are limited to the evaluation of the scales used in the research and causal inference cannot be made. Secondly, the findings are limited to the sample of the research; generalization should be done carefully. Third limitation of the study is that adolescents under the age of 13 and over the age of 16 were not included in the study, as adolescents aged 13–16 years were determined as the group in which both scales could be applied together in line with the validity and reliability studies. Fourthly, in this study, the instruments were answered by their parents who observed their children. The lack of self-reports of adolescents about their internet use and psychosocial status can be considered as a limitation. Finally, the parents who had insufficient information about their children could not be segregated, since the situations of parents' dealing with, observing, and supervising their children are different. Parents' opinions about internet use and psychosocial problems, who evaluate them externally, are important.

Conclusions

The current study revealed that most of the adolescents were internet users and one in five adolescents were at risk of psychosocial problems. The prevalence of internet addiction in adolescents was very low. A medium positive correlation was found between internet addiction and psychosocial problem. Adolescents and their parents should be informed about the harms of excessive internet use and associations between internet use and psychosocial problems. Father's working status and education level, family income, and the daily internet use time was associated with the risk of psychosocial problems; gender, mother's education level, family income, and duration of internet use was associated with the risk of problematic internet use. In planning protective interventions during the pandemic process, sociodemographic factors should also be taken into consideration and priority should be given to adolescents whose family income is low and who use the internet for longer than five years. Adolescents and their parents should be informed

about associations between internet addiction and psychosocial problems by school nurses. Education programs could be implemented at schools to inform the children about the harms of excessive internet use, and psychosocial problem risk. School nurses could cooperate with teachers and school administrators in the implementation of this education program. For the future, it is recommended to conduct prospective studies to confirm these associations. Also, future research on internet addiction and psychosocial problems should be based on multiple sources of information (adolescent self-report, parent, and teacher opinion). If face-to-face education starts at school next year, the results of this situation could be evaluated.

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