International Journal of Assessment Tools in Education
2025, Vol. 12, No. 4, 926–941
https://doi.org/10.21449/ijate.1579992
journal homepage: https://dergipark.org.tr/en/pub/ijate
Research Article

From addiction to pervasiveness: Validation of the Smartphone Pervasiveness Scale in Turkish adolescents

Osman Urfa [1*], **Recep Görgülü** [2]

[1]Ministry of National Education, Burdur, Türkiye
[2]Bursa Uludağ University, Faculty of Sport Sciences, Psychology of Elite Performance Laboratory (PePLaB), Bursa, Türkiye

ARTICLE HISTORY
Received: Nov. 5, 2024
Accepted: June 22, 2025

Keywords:
Smartphone pervasiveness,
Problematic smartphone use,
Smartphone addiction,
Validity,
Reliability.

Abstract: The present study aimed to adapt the Smartphone Pervasiveness Scale (SPS) into Turkish and to examine its psychometric properties among Turkish adolescents. To this end, two studies were conducted. Study 1 explored the factor structure of the SPS through exploratory factor analysis (EFA), using data collected from 216 adolescents (M_{age} = 14.50, SD = 1.55). Study 2 employed confirmatory factor analysis (CFA) with multi-group analysis (MGA) on a separate sample of 314 adolescents (M_{age} = 13.87, SD = 2.10) to confirm the factor structure of the SPS and to assess measurement invariance across gender. In addition, Study 2 examined the associations between SPS scores and several external variables—problematic smartphone use, well-being, loneliness, psychological distress, and academic performance—as evidence of criterion-related validity. In both studies, Cronbach's alpha and composite reliability (CR) coefficients were calculated to assess reliability. EFA results in Study 1 supported a 7-item, single-factor structure, with factor loadings ranging from .46 to .67. CFA results in Study 2 confirmed this structure. Measurement invariance across gender was supported by the MGA. Moreover, criterion-related validity was demonstrated in Study 2: SPS scores were positively correlated with problematic smartphone use, loneliness, and psychological distress, and negatively correlated with well-being and academic performance. In both studies, Cronbach's alpha and CR coefficients were observed at .71 or higher. In conclusion, the Turkish version of the SPS is a valid and reliable instrument for assessing the pervasiveness of smartphone use among Turkish adolescents.

1. INTRODUCTION

Among adolescents, internet and smartphone use is growing every day, and smartphones have become one of the most popular (i.e., easy to reach, handy, availability of various options) tools for accessing the Internet (Mascheroni & Ólafsson, 2016). Many activities, such as using social media, sharing and viewing photos and videos, communicating with friends, following celebrities or popular people globally, playing online games, meeting new people, listening to music, and using it for educational purposes, are carried out via smartphones. So smartphones have a wide range of uses that can appeal to people of all ages. Although smartphones have

*CONTACT: Osman URFA dr.osmanurfa@yahoo.com Ministry of National Education, Burdur, Türkiye

e-ISSN: 2148-7456

many features that make our lives easier, they can also have many negative effects. Especially, childhood and adolescence are important developmental periods for physical, psychological, and physiological development (Steinberg, 2022), and studies show that internet and smartphone use among children is increasing year by year (TÜİK, 2024). Therefore, excessive and uncontrolled use of smartphones, such as continuous gaming or watching videos, may harm children's development.

Among the negative effects of smartphone use, it is considered one of the well-documented addictions in literature. The concept of smartphone addiction is based on the substance dependence and abuse diagnosis criteria in the DSM-IV. According to the DSM-IV, the criteria for substance dependence include an increased tolerance to the substance, withdrawal symptoms, a loss of control over substance use, and negative consequences of substance use on social, occupational, or recreational activities (American Psychiatric Association, 2000). Based on these criteria, smartphone addiction can be explained as follows: people lose control over their smartphone use and experience functional impairment, such as sleep disturbance. They also experience withdrawal symptoms (dysphoric, anxious mood, etc.), and want to use their smartphones more and more over time (Lin *et al*., 2017). In addition, smartphone addiction is considered a behavioral addiction (Lin *et al*., 2017), and behavioral addictions refer to the excessive, uncontrolled, and compulsive use of an activity without a chemical substance (Clark & Limbrick-Oldfield, 2013).

The existing psychological tests in the literature were developed following the DSM-IV. In this regard, the Smartphone Addiction Scale (SAS; Kwon *et al*., 2013a) and its short form (Kwon *et al*., 2013b) are two of the most commonly used scales. The concept of smartphone addiction is frequently used in the literature due to the effect of scales such as SAS. However, there is also criticism of the use of the term 'addiction'. For instance, Panova and Carbonell (2018) state that studies and definitions of smartphone addiction are inadequate in terms of addiction criteria, and these definitions can be more accurately described as overuse or problematic use. Therefore, many studies use the term 'problematic smartphone use' rather than 'smartphone addiction'. Nevertheless, it is still included as both 'addiction' (e.g., Olson *et al*., 2022) and 'problematic use' (e.g., Sohn *et al*., 2019; Urfa, 2024) in the literature. Studies on this subject have found a significant relationship between problematic smartphone use with high levels of depression, anxiety (Boumosleh & Jaalouk, 2017), psychological disturbance, emotion regulation difficulties (Squires *et al*., 2021), frustration intolerance (Urfa, 2024), and low academic performance (Samaha & Hawi, 2016). Many systematic reviews and meta-analyses have also been conducted in this field of research (e.g., Sohn *et al*., 2019; Shahidin *et al*., 2022). For example, one of these aforementioned studies examined the relationship between problematic smartphone use and mental health. The research analyzed 41 studies published between 2011 and 2017 and found an association between problematic smartphone use and high levels of depression, anxiety, stress, and poor sleep quality (Sohn *et al*., 2019). Accordingly, another study examined the relationship between problematic smartphone use and emotion dysregulation and found a moderate positive relationship (Shahidin *et al*., 2022).

Many studies have been, and continue to be, conducted under the frameworks of smartphone addiction or problematic smartphone use. More recently, however, there has been a growing body of research that conceptualizes smartphone use not solely in terms of addiction or problematic use, but also in terms of pervasiveness (e.g., Chakraborty *et al*., 2024). In other words, rather than categorizing individuals as either addicted or not addicted in a binary or descriptive manner, recent studies have begun to adopt a more analytical approach by examining how frequently individuals use smartphones and in which domains of their daily lives (Gerosa *et al*., 2022). For instance, Gui and Gerosa (2021) developed the Smartphone Pervasiveness Scale (SPS) specifically to measure the frequency of smartphone use across different domains of daily life. The SPS assesses how frequently adolescents use smartphones across various domains of daily life (eating, school, watching films, etc.). One of the scale's

distinctive features is its emphasis on the social dimensions of smartphone use in everyday contexts, rather than the pathological aspects (Gerosa *et al*., 2022). In other words, smartphone use is evaluated concerning its social and physiological roles, for example, during studying, spending time with family, or sleeping. Importantly, an individual may not meet criteria for addiction; yet, frequent smartphone use may still disrupt daily functioning. In this regard, the SPS makes a valuable contribution to the existing literature by broadening the conceptualization of smartphone use beyond strictly problematic or addictive frameworks.

The SPS is a relatively recent instrument, and while it holds significant potential for advancing research in this area, empirical studies employing the scale remain limited. Existing findings suggest that higher levels of smartphone pervasiveness are associated with increased time spent on smartphones (Chakraborty *et al*., 2024) and lower academic performance among adolescents (Gerosa *et al*., 2022). Although there are many studies on smartphone addiction and problematic use, there is limited literature on the pervasiveness of smartphones and how often they are used in which aspects of life. To address this limitation, further research using the SPS should be conducted, and cross-cultural comparisons should be made by adapting the SPS to different languages and cultures by examining its psychometric properties.

In the current study, the Turkish form of the SPS was created, and the validity and reliability studies of the Turkish form were examined. As in many cultures, smartphones are widely used from an early age in Türkiye. In 2024, the Turkish Statistical Institute (TURKSTAT) surveyed the use of information technologies among children. The results showed that 91.3% of children aged 6–15 use the internet, primarily for watching videos. The survey also revealed that 53.5% of 6–10-year-olds and 86.2% of 11–15-year-olds use smartphones (TÜİK, 2024). The current study examines the pervasiveness of smartphone use, and the TURKSTAT report shows that children in Türkiye start using smartphones at an early age. Additionally, the problematic use of smartphones has been examined among various groups, including adolescents, university students, and adults, in Türkiye. Studies have demonstrated that problematic smartphone use is associated with physiological and psychological constructs such as depression, anxiety, stress (Kabadayı, 2024), bedtime procrastination, sleep quality (Bozkurt *et al*., 2024), frustration intolerance (Urfa, 2024), psychiatric symptoms, and emotion regulation difficulties (Gül *et al*., 2019) in Turkish culture. Based on all of this, it is thought that adapting SPS to Turkish culture will generate a wealth of new studies and take smartphone research in a different direction. Studies will address smartphones in terms of not only addiction or problematic use, but also frequency of use. Thus, it will be possible to examine the consequences of adolescents using their smartphones more frequently in different areas of their lives.

The present research was conducted in two consecutive studies. In Study 1, the items of the SPS were translated into Turkish using the back-translation method, and the factor structure was examined through exploratory factor analysis (EFA). In Study 2, the factor structure identified in Study 1 was tested using confirmatory factor analysis (CFA) on an independent sample. Following the CFA, the measurement invariance of the SPS across gender was examined. Previous research conducted with children in Türkiye has shown that males tend to use the internet and smartphones more frequently than females and are more likely to engage in digital gaming (TÜİK, 2024). Therefore, consistent with the approach taken in the original validation study (Gerosa *et al*., 2022), measurement invariance across gender was assessed using multi-group analysis (MGA).

Study 2 also examined the criterion-related validity of the SPS by investigating its associations with problematic smartphone use, psychological distress, well-being, loneliness, and academic performance. Prior research has shown that problematic smartphone use is associated with lower well-being, increased loneliness, greater psychological distress, and poorer academic outcomes (Mahapatra, 2019; van der Schuur *et al*., 2015). Accordingly, in the present study, it was hypothesized that smartphone pervasiveness would be positively associated with

problematic smartphone use, loneliness, and psychological distress, and negatively associated with well-being and academic performance. Evidence of these expected relationships would provide support for the criterion-related validity of the SPS.

2. METHOD

2.1. Participants

Two different samples were recruited across the two studies in the present research. The first sample was used for exploratory factor analysis (EFA), while the second sample was employed for confirmatory factor analysis (CFA) and criterion-related validity testing. According to the literature, sample size guidelines for factor analysis recommend either a minimum of 10 participants per item or at least 200 participants (DeVellis, 2017). Given that the SPS consists of 7 items, a sample size of 70 participants would be the minimum; however, to ensure more robust and reliable factor analysis results, the target was to recruit at least 200 participants for each study. Since criterion-related validity was assessed in Study 2, sample size was further calculated with G*Power 3.1.9.7 (Faul *et al*., 2007). Assuming a medium effect size (0.3), an alpha level of .01, and statistical power of .99, the required minimum sample size was to be at least 222 participants. Accordingly, the recruitment target for Study 2 set at 222 or more participants.

Participants were secondary and high school students continuing their education from Burdur province, in Türkiye. A convenience sampling method was employed to recruit the participants. Permission to conduct the research was obtained from the Ministry of National Education for three high schools and three middle schools located in different neighborhoods of Burdur city center. The study procedures were first explained to school administrators, parents, and students. Only students whose parents and who themselves provided informed consent were invited to complete the study scales.

Descriptive statistics of the participants are presented in Table 1. In total, 530 secondary and high school students participated across the two studies, with 216 in Study 1 (Sample 1) and 314 in Study 2 (Sample 2). In Study 1, 31.48% of the participants were middle school students and 68.52% were high school students; 61.57% were boys and 38.43% were girls. In Study 2, 55.73% of the participants were middle school students and 44.27% were high school students; 44.59% were boys and 55.41% were girls. All participants reported using smartphones. The average age was 14.50 (*SD* = 1.55) in Study 1 and 13.87 (*SD* = 2.10) in Study 2.

Table 1. *Participants.*

		Sample 1		Sample 2	
		f	%	*f*	%
School	Middle school	68	31.48	175	55.73
	High school	148	68.52	139	44.27
Gender	Boys	133	61.57	140	44.59
	Girl	83	38.43	174	55.41
Devices in use*	Smartphone	216	100	314	100
	Tablet	48	22.22	91	28.98
	Computer	110	50.93	142	45.22
		Mean ± SD		Mean ± SD	
Age		14.50 ± 1.55		13.87 ± 2.10	
Sibling count		2.39 ± 0.83		2.18 ± 0.92	
Daily smartphone use (hours)		3.55 ± 2.32		3.50 ± 2.30	

2.2. Measures

2.2.1. *Personal information sheet*

The personal information sheet includes information about the participants' age, gender, grade level at school, daily smartphone usage time, and last academic year's grade points average (GPA).

2.2.2. *Smartphone pervasiveness scale*

The Smartphone Pervasiveness Scale was developed by Gui and Gerosa (2021) to measure how often adolescents use smartphones in different areas of life (eating, friends, school, etc.). The original scale is a 4-point Likert-type scale consisting of 5 items. Factor analysis confirmed the single-factor structure of the scale (RMSEA = .055, CFI = .991, TLI = .981) and the internal consistency coefficient is within acceptable limits (Cronbach alpha = .723). Later, two more items were added to the scale, and the 7-item form of the scale was organized according to a 5-point Likert-type response (Gui *et al*., 2018). Gerosa *et al*. (2022) examined the validity and reliability of the scale in Italian adolescents. In this study, in which both exploratory and confirmatory factor analyses were performed, the 7-item and single-factor structure of the scale was confirmed.

2.2.3. *General health questionnaire*

The General Health Questionnaire (GHQ) was developed by Goldberg (1972, 1978) to measure psychological distress. The GHQ has 4 forms with 12, 28, 30 items. While the 12-item form measures psychological distress as a single dimension, the other forms analyze psychological distress according to subgroups. The 12 and 28-item forms of the inventory were adapted into Turkish by Kılıç (1996). The Turkish adaptation of the GHQ was administered to 121 patients referred to a psychiatric outpatient clinic. In 12-item Turkish form, the sensitivity and specificity of the Turkish form of the GHQ were calculated as .74 and .82, respectively. Cronbach's alpha internal consistency of the GHQ is .78, and test-retest reliability is .84 (Kılıç, 1996). The validity and reliability of the WHO-5 were examined in the current sample. For the construct validity, 12-item and single-factor structure of the GHQ was tested with CFA and acceptable fit values were obtained (S-Bχ^2 / *df* = 2.845, CFI = .917, TLI = .900, RMSEA = .077, SRMR = .050). Item factor loadings were found to be between .426 and .754. In addition, the Cronbach's alpha internal consistency coefficient of the questionnaire was .89 in the current study.

2.2.4. *WHO 5 - Well-being index*

WHO-5 (The World Health Organization Well-Being Index) is an inventory created by the World Health Organization to measure well-being (WHO, 1998). There are 5 items measuring well-being in the inventory, and these items are evaluated according to a 6-point Likert scale. Turkish adaptation of the inventory was conducted by Eser *et al*. (2019). In the Turkish adaptation study of the WHO-5, the EFA results showed that the 5-item, single-factor structure explained 58.5% of the total variance for adults and 63.9% for older adults. Item factor loadings ranged from .50 to .85. The CFA results showed that although the 5-factor structure was close to acceptable levels for adults (CFI = .989, NFI = .986, GFI = .987, RMSEA = .073, SRMR = .021) and older adults (CFI = .956, NFI = .954, GFI = .946, RMSEA = .166, SRMR = .043), it provided a better model fit for adults. The internal consistency coefficient calculated for the reliability of the WHO-5 was found to be .81 for adults and .86 for the elderly (Eser *et al*., 2019). The validity and reliability of the WHO-5 were examined in the current sample. For the construct validity, the 5-item and single-factor structure of the WHO-5 was tested with CFA and excellent fit values were obtained (S-Bχ^2 / *df* = 1.556, CFI = .991, TLI = .973, RMSEA = .066, SRMR = .021). Item factor loadings were found to be between .625 and .725. In addition, the internal consistency coefficient of the inventory was found to be .76 in the current study.

2.2.5. *Smartphone addiction scale - Short version*

It is the shortened version of the 33-item Smartphone Addiction Scale (SAS) developed by Kwon *et al*. (2013a) by Kwon *et al*. (2013b). The original 33-item SAS was subjected to content validity evaluation by seven expert reviewers, from which a condensed 10-item version (SAS-SV) was subsequently developed for administration to adolescent samples. The SAS-SV consists of 10 items and single dimension to measure smartphone addiction. The scale items are evaluated according to a 6-point Likert scale (1: strongly disagree, 6: strongly agree). The Cronbach alpha internal consistency coefficient is .91, and the corrected item total score correlations are between .50 and .80 (Kwon *et al*., 2013b). The Turkish adaptation of the scale was conducted by Şata and Karip (2017) in Turkish adolescents. In this study, ten items and one dimension were found to be consistent with the original scale. As a result of the confirmatory factor analysis for the construct validity of the Turkish form, acceptable fit indices were obtained (GFI = .93, CFI = .99, RMSEA = .064). The internal consistency coefficients calculated for the reliability of the scale were also high (Cronbach's alpha = .90, McDonald's omega = .94) (Şata & Karip, 2017). The validity and reliability of the SAS-SV were examined in the current sample. For the construct validity, the 10-item and single-factor structure of the SAS-SV was tested with CFA, and excellent fit values were obtained (S-Bχ^2 / *df* = 1.209, CFI = .996, TLI = .994, RMSEA = .027, SRMR = .058). Item factor loadings were found to be between .393 and .802. In the current study, the Cronbach's alpha internal consistency coefficient of the SAS-SV was .86.

2.2.6. *UCLA loneliness scale - Short form*

The UCLA Loneliness Scale, one of the most widely used instruments for assessing loneliness, was employed in this study. The original scale comprises 20 items; however, a shortened version was developed by Hays and DiMatteo (1987). To create this abbreviated form, Hays and DiMatteo (1987) conducted an exploratory analysis (EFA) on data collected from 199 college students who completed all 20 items. After EFA, a short form consisting of eight items and a single factor emerged. The eight items explained 67.44% of the total variance, and item factor loadings ranged from .31 to .73. The Cronbach's alpha internal consistency coefficient of the 8 items is .84 (Hays & DiMatteo, 1987). Turkish adaptation of the scale was conducted by Yıldız and Duy (2014) in 293 high school students aged between 14 and 19. In the adaptation study, firstly, principal component analysis was used in conjunction with parallel analysis to determine the item-factor structure of the scale. In the analyses, one item was removed because its factor loading was less than .30, and the Turkish form of the scale showed a single-factor structure with seven items. Seven items explained 40.99% of the total variance, and item factor loadings ranged from .31 to .73. The 7-item, single-factor structure of the scale was confirmed by the CFA conducted after the EFA (χ^2 / *df* = 1.94, RMSEA = .06, SRMR = .04, GFI = .97, AGFI = .95, CFI = .98, NFI = .96, NNFI = .97). Cronbach's alpha internal consistency coefficient calculated for reliability is .74, and the composite reliability coefficient is .75 (Yıldız & Duy, 2014). The validity and reliability of the scale were examined in the current sample. For the construct validity, the 7-item and single-factor structure of the scale was tested with CFA, and acceptable fit values were obtained (S-Bχ^2 / *df* = 3.155, CFI = .944, TLI = .916, RMSEA = .075, SRMR = .075). Item factor loadings were found to be between .396 and .907. The internal consistency coefficient of the scale was found to be .73 in the current study.

2.3. Procedure

Permission for the Turkish adaptation of the Smartphone Pervasiveness Scale was initially obtained from Marco Gui via e-mail. Following permission, ethical approval was obtained from the Social and Human Sciences Research and Publication Ethics Committee of Bursa Uludağ University (date: 27.09.2024, number: 2024/9, decision number: 7). After approval from the ethics committee, permission to implement the data collection tools in secondary and high schools was obtained from the Turkish Ministry of National Education.

Following approval from the Ethics Committee and the Turkish Ministry of National Education, the scale items were translated into Turkish using the approach recommended by Beaton *et al*. (2000). Initially, two English teachers, both native Turkish speakers, independently translated items into Turkish. These translations were reviewed and synthesized by the researchers into a single version. Subsequently, two different English teachers performed a back-translation of this Turkish version into English. The original scale items and back-translated versions were then compared to identify and resolve any discrepancies or ambiguities. The iterative process resulted in the finalized Turkish version of the scale (see Appendix 1 and Appendix 2). To assess the clarity and comprehensibility of the translated items, the Turkish form was administered to ten eighth-grade students and two psychological counselors using the think-aloud protocol (Jääskeläinen, 2012). This procedure allowed for the examination of participants' cognitive processes while completing the scale and provided qualitative feedback on the items. All participants reported a clear understanding of the items, and no negative feedback was received. After the Turkish translation of the scale items was completed, the schools were contacted. Schools were selected to represent different parts of the city and regions with different socio-demographic environments. Data collection was subsequently conducted in three secondary schools and three high schools. Before participation, both students and their parents were provided with detailed information about the study, and informed consent was obtained from both parties. Only students who provided both their own consent and parental consent participated in the study.

2.4. Data Analysis

The study investigated the validity and reliability of the SPS using data collected from two independent samples. Prior to data analysis, outliers were identified and removed from both datasets. Specifically, five participants from the first sample and twelve participants from the second sample were excluded based on Mahalanobis distance. Subsequent analyses were conducted on the finalized datasets.

Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted to test the construct validity of the SPS. In the analysis of the data, exploratory factor analysis (EFA) was conducted first. The Kaiser-Meyer-Olkin (KMO) value for EFA was found to be .739, and Bartlett's sphericity test was significant (χ^2 = 209.516, df = 21, p < .001). These values indicate that the dataset is suitable for factor analysis (Field, 2012). Parallel analysis (Horn, 1965) was used to determine the number of factors as a result of EFA. As a rotation technique, oblimin rotation, which is one of the oblique rotation methods, was used because it was thought that there would be a relationship between usage frequencies in different areas of smartphones in daily life (Hair *et al*., 2014). Furthermore, principal axis factoring was used as a factoring method in EFA.

The item-factor structure obtained after EFA was tested in another sample (sample 2) using confirmatory factor analysis (CFA). As the dataset did not fulfill the multivariate normality assumption (Mardia Skewness = 1376.11, p < .01, Mardia kurtosis = 21.87, p < .01; Korkmaz *et al*., 2014), robust goodness-of-fit indices with Satorra-Bentler (S-B) correction were used to analyze the data (Gana & Broc, 2019). For this purpose, χ^2 / df, CFI, TLI, RMSEA and SRMR goodness-of-fit indices were used. Among these indices, CFI and TLI values above .90 and RMSEA and SRMR values below .08 indicate that the factor structure of the scale is acceptable (Hu & Bentler, 1999). Following the CFA, a multi-group analysis (MGA) was conducted to test the measurement invariance of SPS across gender (boys and girls). Boys were coded as '0' and girls as '1'. Changes in CFI (ΔCFI), RMSEA (ΔRMSEA), and SRMR (ΔSRMR) were tested for measurement invariance. Measurement invariance is indicated by ΔCFI, ΔRMSEA and ΔSRMR values less than |.01|, |.015|, and |.030|, respectively (Chen, 2007; Cheung & Rensvold, 2002). First, configural invariance, which tests whether the factor structure of the scale is the equal across subgroups (boys-girls), was examined. Then metric, strong, and strict

invariances were tested respectively. Metric invariance indicates factor loadings, strong invariance indicates factor loadings and intercepts, and strict invariance indicates that factor loadings, intercepts, and measurement error variance are equal across subgroups (Gana & Broc, 2019).

In order to test the criterion-related validity of the SPS, the relationship between the SPS scores with well-being, loneliness, psychological distress, problematic smartphone use, and academic performance was examined. Therefore, Pearson's product-moment correlation analysis was used to examine the relationship between variables. Finally, the Cronbach's alpha internal consistency and the composite reliability (CR) coefficients were analyzed for the reliability of the SPS. Both coefficients of .70 and above are known as acceptable reliability (Hair *et al*., 2014). IBM SPSS Statistics 22 and JASP 0.18.3 were used for data analysis.

3. RESULTS

3.1. Item Analysis (Study 1 and 2)

Table 2 shows mean, standard deviation, and corrected item total score correlation coefficients of the scale items. In Sample 1, the item means ranged from 1.26 (i6) to 2.88 (i7), and the corrected item total score correlations ranged from .32 (i6) to .48 (i2). In sample 2, the item means ranged from 1.21 (i6) to 2.90 (i7) and the corrected item total score correlations ranged from .38 (i1) to .59 (i4).

Table 2. *Result of the item analysis.*

	Sample 1 (Study 1)			Sample 2 (Study 2)		
	Mean	*SD*	Corrected item total score correlation	Mean	*SD*	Corrected item total score correlation
m1	1.69	1.16	.36	1.64	1.17	.38
m2	2.65	1.11	.48	2.42	1.20	.55
m3	2.13	1.14	.41	2.09	1.20	.45
m4	2.09	1.33	.45	2.18	1.44	.59
m5	2.66	1.52	.47	2.46	1.56	.56
m6	1.26	0.92	.32	1.21	.77	.43
m7	2.88	1.30	.42	2.90	1.35	.49

3.2. Exploratory Factor Analysis and Reliability (Study 1)

Exploratory factor analysis (EFA) was conducted to explore the factor structure of the scale (Table 3).

Table 3. *Factor loadings and reliability coefficients obtained after EFA and CFA.*

	EFA (Study 1)			CFA (Study 2)		
Items	Factor loadings	α	CR	Factor loadings	α	CR
m1	.53	.71	.79	.42	.77	.77
m2	.66			.65		
m3	.59			.49		
m4	.63			.70		
m5	.67			.69		
m6	.46			.44		
m7	.60			.57		

The parallel analysis conducted for the EFA indicated that the SPS had a single factor structure. This single-factor structure explained 35% of the total variance of the scale. The factor loadings of the items were between .46 (m6) and .67 (m5). The Cronbach alpha internal consistency coefficient calculated for reliability was found to be .71, while the composite reliability coefficient was found to be .79.

3.3. Confirmatory Factor Analysis and Reliability (Study 2)

The 7 items and the single-factor structure obtained as a result of EFA were tested in sample 2 using confirmatory factor analysis (CFA) (Tables 3 and 4). Acceptable fit values were obtained after CFA (S-Bχ^2 = 41.959, *df* = 14, CFI = .938, TLI = .908, RMSEA = .078, SRMR = .045) (Table 4). The factor loadings of the items ranged from .42 (i1) to .70 (i4). The Cronbach's alpha internal consistency coefficient calculated for reliability was .77, while the composite reliability coefficient was .77 (Table 3).

Table 4. *CFA model fit indices and measurement invariance across gender.*

	S-Bχ^2 (*df*)	TLI	CFI (ΔCFI)	RMSEA (ΔRMSEA)	SRMR (ΔSRMR)
All participants	41.959 (14)	.908	.938	.078	.045
Boys	28.236 (14)	.898	.932	.075	.053
Girls	32.630 (14)	.895	.930	.077	.054
Configural invariance	60.867 (28)	.896	.931	.076	.057
Metrik invariance	73.367 (34)	.891	.926 (.005)	.086 (.010)	.068 (.011)
Scalar invariance	80.067 (40)	.889	.924 (.002)	.089 (.003)	.071 (.003)
Strict invariance	88.681 (47)	.893	.921 (.003)	.084 (.005)	.078 (.006)

3.4. Measurement Invariance of the SPS (Study 2)

Measurement invariance results across gender are shown in Table 4. The CFA results indicated that the 7-item and single-factor structure of the SPS had acceptable fit indices for both girls and boys. For measurement invariance, configural, metric, scalar, and strict invariance were tested respectively, and the results of the analyses showed that ΔCFI was between .002 and .005, ΔTLI was between .002 and .005, ΔRMSEA was between .003 and .010, and ΔSRMR was between .003 and .011.

3.5. Criterion-Related Validity (Study 2)

For criterion-related validity, the relationship between smartphone pervasiveness scores with problematic smartphone use, well-being, loneliness, psychological distress, and academic performance were examined using correlation analysis (Table 5).

Table 5. *Descriptive statistics and correlation coefficients of the variables.*

	Descriptives				Correlation coefficients				
	Mean	*SD*	Skewness	Kurtosis	SP	PSU	WHO 5	UCLA	PD
SP	2.13	0.82	1.17	1.57	-				
PSU	2.54	1.06	0.47	-0.40	.42**	-			
WHO 5	2.65	1.20	-0.11	-0.57	-.18**	-.27**	-		
UCLA	1.87	0.63	0.61	-0.25	.19**	.22**	-.26**	-	
PD	2.00	0.70	0.91	0.84	.31**	.40**	-.57**	.53**	-
GPA	83.08	12.22	-0.73	-0.22	-.35**	-.14*	.18**	-.14*	-.12

SP: Smartphone pervasiveness; PSU: Problematic smartphone use; WHO 5: WHO 5 - Well-being index; UCLA: UCLA loneliness; PD: Psychological distress; GPA: Last academic year's GPA.

** $p < .01$ * $p < .05$

The analysis revealed a positive relationship between smartphone pervasiveness with problematic smartphone use (r = .42, p < .01), loneliness (r = .19, p < .01), and psychological distress (r = .31, p < .01). At the same time, smartphone pervasiveness was negatively correlated with well-being (r = -.18, p < .01) and academic GPA (r = -.35, p < .01).

4. DISCUSSION and CONCLUSION

The present study aims to examine the psychometric properties of the Turkish version of the Smartphone Pervasiveness Scale (SPS). Accordingly, the Turkish form of the SPS was created and its validity and reliability analyses were examined in two different samples. Exploratory factor analysis (EFA) was conducted to investigate the factor structure of the scale in Sample 1. Subsequently, confirmatory factor analysis (CFA) was employed with Sample 2 to validate the factor structure and assess the criterion-related validity of the scale. Both samples underwent item analysis and reliability testing accordingly.

Item analysis included the examination of item means, standard deviations, and corrected item-total score correlations. In the current study, item means ranged from 1.26 (i6: 'At school, during lessons') to 2.88 (i7: 'While you are watching a movie or a TV show'), whereas in the original study (Gerosa *et al*., 2022) they ranged from 1.6 (i1: 'At dinner with your family') to 2.7 (i5: 'First thing in the morning, when you wake up') among Italian adolescents. Although the overall mean scores were similar across cultures, the items with the lowest and highest mean scores differed. Turkish adolescents reported the lowest smartphone use during school lessons, whereas Italian adolescents reported the lowest use during family dinners. Conversely, Turkish adolescents indicated the highest usage while watching films or TV programs, while Italian adolescents reported the highest use immediately upon waking. Corrected item-total correlations were also analyzed, with the lowest correlations observed being .32 (item 6: 'At school, during lessons') in Sample 1 and .38 (item 1: 'At dinner with your family') in Sample 2. All correlation coefficients exceeded the recommended threshold of .30, indicating strong item discrimination (Büyüköztürk, 2012). The relatively low mean and correlation for item 6 are consistent with the common restriction on smartphone use in Turkish classrooms.

According to the EFA and CFA for construct validity, the 7-item and single-factor structure of the original scale (Gerosa *et al*., 2022) was confirmed in the Turkish adolescents. EFA showed that the 7 items explained 35% of the total variance of the SPS. In the original form of the SPS (Gerosa *et al*., 2022), similar results were found to the present study and explained 40% of the total variance of the scale. It is recommended that the explained variance ratio should be 66% (2/3) and above, but a value of 30% and above is considered acceptable for single-factor scales (Büyüköztürk, 2012). Therefore, it is a clear indication that the variance explained in the current study is sufficient. However, the scale could be revised in future research to increase the explained variance ratio. The scale currently consists of seven items and does not cover all the places/areas where adolescents can use their smartphones (e.g., during public transport/vehicle travel or while resting after an activity). While the scale in its present form is specifically designed for adolescent participants, future research endeavors may warrant the development of an adult version that incorporates contextually relevant items addressing adult smartphone use patterns, such as usage during professional activities, driving, and commercial transactions. Thus, it is thought that adding items for the possible usage areas of smartphones could increase the explained variance ratio. Additionally, the EFA results showed item factor loadings between .46 (i6: 'At school, during the lessons') and .67 (i5: 'First thing in the morning, when you wake up'). Similar to the current study, the factor loadings of the SPS in the original study (Gerosa *et al*., 2022) were found to be between .45 (i7: 'While you are watching a movie or a TV show') and .63 (i3: 'While you are studying'). The original and Turkish forms of the SPS were found to have similar factor loadings in EFA. According to the literature, the item factor loadings should be at least .364 for a sample size of 200 for EFA (Field, 2012). Therefore, the item factor loadings were found to be sufficient.

The CFA results based on EFA have acceptable goodness of fit indices (S-Bχ^2 = 41.959, *df* = 14, CFI = .938, TLI = .908, RMSEA = .078, SRMR = .045) (Kline, 2011). In the CFA results, the lowest item factor loading was found to be .42. For CFA, the threshold value of .40 was determined as the lowest factor loading (Hair et al., 2017). Therefore, all items have sufficient factor loadings. Following the CFA, the measurement invariance of the SPS was analysed according to the child's gender using a multi-group analysis (MGA). As a result of the MGA, ΔCFI values were less than |.01|, ΔRMSEA values were less than |.015| and ΔSRMR values were less than |.030|; therefore, it was seen that the SPS provided strict invariance. In other words, the factor loadings, intercepts, and measurement error variance of the SPS Turkish form are equal across gender (Chen, 2007; Cheung & Rensvold, 2002). In line with the current study, the original study of the SPS (Gerosa *et al*., 2022) showed measurement invariance across children's gender. Furthermore, Gerosa *et al*. (2022) demonstrated that the SPS exhibited measurement invariance across different levels of parental education. Consequently, it is recommended that future research investigate the measurement invariance of the Turkish version of the SPS concerning parents' educational attainment.

Cronbach's alpha internal consistency coefficient and composite reliability coefficient were calculated for the reliability of the SPS. These coefficients were found to be .71 and .79 in Study 1 and .77 and .77 in Study 2, respectively. Both coefficients of .70 and above are considered acceptable reliability (Hair *et al*., 2014). Therefore, the SPS was found to have an acceptable level of internal consistency. In the original study of the SPSS (Gerosa *et al*., 2022), the Cronbach's alpha internal consistency coefficient was also found to be .73, which is similar to the current study.

The criterion-related validity of the SPS was assessed by examining its relationships with problematic smartphone use, well-being, loneliness, psychological distress, and academic GPA. Consistent with the hypotheses, smartphone pervasiveness was significantly positively correlated with problematic smartphone use, loneliness, and psychological distress, and significantly negatively correlated with well-being and academic GPA. These findings provide further support for the validity of the SPS. The scale aims to evaluate the impact of pervasive smartphone use on individuals' physiological, psychological, and social functioning (Gerosa *et al*., 2022), and the results of the correlation analyses align with this objective.

Pervasive smartphone use was found to be associated with adverse social, psychological, and academic outcomes, including increased loneliness, elevated psychological distress, and reduced academic performance. Thus, pervasive smartphone use appears to pose risks to the psychological, social, and academic functioning of Turkish adolescents. In light of these findings, it is recommended that efforts be made to reduce the frequency of smartphone use to support adolescent mental health. Specifically, ministries and municipalities, in collaboration with institutions such as schools and youth centers, should provide school-based psychological services, as well as opportunities for engagement in sports, arts, and social activities from an early age.

The results of the correlation analysis reveal an additional significant finding that supports the conceptual foundation of the SPS. Specifically, the correlation coefficients between problematic smartphone use and well-being, loneliness, and psychological distress are higher than those between smartphone pervasiveness and these variables. Conversely, the correlation between academic performance and smartphone pervasiveness is stronger than that between academic performance and problematic smartphone use. This suggests that problematic smartphone use is more closely associated with well-being, loneliness, and psychological distress, whereas smartphone pervasiveness is more strongly linked to academic performance. The SPS primarily focuses on the widespread and excessive use of smartphones, rather than on pathological behaviors such as addiction. Consequently, it emphasizes how individuals engage with family, peers, and academic responsibilities (Gerosa *et al*., 2022). Therefore, the stronger association between SPS scores and academic performance, relative to psychological variables,

is an anticipated outcome. Future research investigating the SPS within the context of social relationships—such as adolescents' socialization patterns with family and peers and their communication styles—would further contribute to understanding these dynamics.

Based on the findings from all analyses, it can be concluded that the Turkish version of the SPS is a valid and reliable instrument for assessing the pervasiveness of smartphone use among adolescents. While numerous studies in the literature focus on constructs such as 'smartphone addiction' or 'problematic smartphone use,' the concept of 'smartphone pervasiveness' is relatively novel and offers a fresh perspective for research in this area. This study explored the relationships between smartphone pervasiveness and problematic smartphone use, well-being, loneliness, psychological distress, and academic GPA, yielding results consistent with theoretical expectations.

There remain many variables that warrant further investigation. Future research could explore the associations between smartphone pervasiveness and adolescents' social relationships (e.g., family and peer interactions), physical and mental health outcomes, and psychiatric diagnoses. Additionally, the SPS may serve as a useful measure to evaluate the effectiveness of experimental interventions aimed at reducing problematic smartphone use by examining whether such interventions decrease the pervasiveness of smartphone use among adolescents. Previous longitudinal research has highlighted the association between parental addiction and child addiction to smartphones (Jeong *et al*., 2024). Thus, it is recommended that future studies examine the relationship between parental and adolescent smartphone pervasiveness to inform family-based interventions. Moreover, comparative studies assessing the effects of smartphone usage frequency across different age groups and socioeconomic statuses would provide valuable insights. Further psychometric research is also encouraged. Large-scale normative studies using item response theory could deepen understanding of the SPS's measurement properties. While the current study established internal consistency reliability, future work should assess test-retest reliability to confirm the scale's temporal stability.

Finally, several limitations of the present study should be acknowledged. The primary limitation concerns the sample, which was drawn from a single province in Türkiye, a country characterized by considerable ethnic and cultural diversity. Additionally, all measures employed were self-reported, which may introduce response biases. Furthermore, the cross-sectional design, with data collected at a single time point, precludes any conclusions about causal relationships among the variables. Future longitudinal studies examining the outcomes and stability of the SPS over time are recommended to address these limitations and contribute further to the literature.

Declaration of Conflicting Interests and Ethics

The authors declare no conflict of interest. This research study complies with research publishing ethics. The scientific and legal responsibility for manuscripts published in IJATE belongs to the authors. **Ethics Committee Number**: Bursa Uludağ University, Social and Human Sciences Research and Publication Ethics Committee, 2024/9, decision number: 7.

Contribution of Authors

Osman Urfa: Conceptualization, Investigation, Resources, Software, Formal Analysis, and Writing-original draft. **Recep Görgülü**: Conceptualization, Writing, Review, and Editing.

Orcid

Osman Urfa https://orcid.org/0000-0002-9821-671X
Recep Görgülü https://orcid.org/0000-0003-2590-4893

REFERENCES

American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders: DSM-IV-TR*. American Psychiatric Association.

Beaton, D.E., Bombardier, C., Guillemin, F., & Ferraz, M.B. (2000). Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine, 25*(24), 3186-3191. https://doi.org/10.1097/00007632-200012150-00014

Bozkurt, A., Demirdöğen, E.Y., & Akıncı, M.A. (2024). The association between bedtime procrastination, sleep quality, and problematic smartphone use in adolescents: A mediation analysis. *The Eurasian Journal of Medicine, 56*(1), 69-75. https://doi.org/10.5152/eurasianjmed.2024.23379

Büyüköztürk, Ş. (2012). *Sosyal bilimler için veri analizi el kitabı [Handbook of data analysis for the social sciences]*. Pegem Akademi.

Cai, Z., Mao, P., Wang, Z., Wang, D., He, J., & Fan, X. (2023). Associations between problematic internet use and mental health outcomes of students: A meta-analytic review. *Adolescent Research Review, 8*(1), 45–62. https://doi.org/10.1007/s40894-022-00201-9

Chakraborty, S., Gui, M., Gerosa, T., & Marciano, L. (2024). Testing the validity of the smartphone pervasiveness scale for adolescents with self-reported objective smartphone use data. *Digital Health, 10*. https://doi.org/10.1177/20552076241234744

Chen, F.F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling, 14*(3), 464-504. https://doi.org/10.1080/10705510701301834

Cheung, G.W., & Rensvold, R.B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*(2), 233-255. https://doi.org/10.1207/S15328007SEM0902_5

Clark, L., & Limbrick-Oldfield, E.H. (2013). Disordered gambling: a behavioral addiction. *Current Opinion in Neurobiology, 23*, 655-659. http://dx.doi.org/10.1016/j.conb.2013.01.004

DeVellis, R.F. (2017). *Scale development: Theory and applications* (4th ed.). Sage.

Eser, E., Çevik, C., Baydur, H., Güneş, S., Esgin, T.A., Öztekin, Ç., Eker, E., Gümüşsoy, U., Eser, G.B., & Özyurt, B. (2019). Reliability and validity of the Turkish version of the WHO-5, in adults and older adults for its use in primary care settings. *Primary Health Care Research ve Development, 20*(e100), 1-7. https://doi.org/10.1017/S1463423619000343

Faul, F., Erdfelder, E., Lang, A.G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*, 175–191. https://doi.org/10.3758/bf03193146

Field, A., Miles, J., & Field, Z. (2012). *Discovering statistics using R*. Sage.

Gana, K., & Broc, G. (2019). *Structural equation modeling with lavaan*. John Wiley & Sons.

Gerosa, T., Gui, M., & Büchi, M. (2022). Smartphone use and academic performance: a pervasiveness approach beyond addiction. *Social Science Computer Review, 40*(6), 1542–1561. https://doi.org/10.1177/08944393211018969

Goldberg, D.P. (1972). *Detecting psychiatric illness by questionnaire*. Oxford University Press.

Goldberg, D.P. (1978). *Manual of the General Health Questionnaire*. NFER-Nelson.

Gui, M., & Gerosa, T. (2021). Smartphone pervasiveness in youth daily life as a new form of digital inequality. In E. Hargittai (Ed.), *The handbook of digital inequality* (pp. 131–147). Edward Elgar Publishing.

Gui, M., Gerosa, T., Garavaglia, A., Petti, L., & Fasoli, M. (2018). *Digital well-being. Validation of a digital media education programme in high schools*. Report. Research Center on Quality of Life in the Digital Society. University of Milano Bicocca.

Gül, H., Fırat, S., Sertçelik, M., Gül, A., Gürel, Y., & Kılıç, B.G. (2019). Cyberbullying among a clinical adolescent sample in Turkey: effects of problematic smartphone use, psychiatric

symptoms, and emotion regulation difficulties. *Psychiatry and Clinical Psychopharmacology*, *29*(4), 547–557. https://doi.org/10.1080/24750573.2018.1472923

Hair, J.F., Black, W.C., Babin, B.J., & Anderson, R.E. (2014). *Multivariate data analysis*. Pearson.

Hair, J.F., Hult, G.T.M., Ringle, C.M., & Sarstedt, M. (2017). *A primer on partial least squares structural equation modeling (PLS-SEM)*. SAGE Publications.

Hays, R.D., & DiMatteo, M.R. (1987). A short-form measure of loneliness. *Journal of Personality Assessment, 51*, 69–81. https://doi.org/10.1207/s15327752jpa5101_6

Horn, J.L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika, 30*, 179–185.

Hu, L., & Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Jääskeläinen, R. (2012). Think-aloud protocol. In Y. Gambier & L. Doorslaer (Eds.), *Handbook of translation studies: Volume 1* (pp. 371–373). John Benjamins.

Jeong, K.H., Kim, S., Ryu, J.H., & Lee, S. (2024). A longitudinal relationship between mother's smartphone addiction to child's smartphone addiction. *International Journal of Mental Health and Addiction, 22*(4), 1771–1782. https://doi.org/10.1007/s11469-022-00957-0

Kabadayı, F. (2024). The examination of the relationship between irrational beliefs, depression, anxiety, stress and internet addiction in emerging adults. *Nevşehir Hacı Bektaş Veli Üniversitesi SBE Dergisi, 14*(3), 1645-1667. https://doi.org/10.30783/nevsosbilen.1514229

Kılıç, C. (1996). Genel Sağlık Anketi: Geçerlik ve güvenirlik çalışması [General Health Questionnaire: Validity and reliability study]. *Türk Psikiyatri Dergisi, 7*(1), 3–11.

Kline, R.B. (2011). *Principles and practice of structural equation modeling*. Guilford Publications.

Korkmaz, S., Goksuluk, D., & Zararsiz, G. (2014). MVN: An R package for assessing multivariate normality. *The R Journal, 6*(2), 151–62.

Kwon, M., Kim, D.J., Cho, H., & Yang, S. (2013b). The smartphone addiction scale: Development and validation of a short version for adolescents. *PLoS ONE, 8*(12). https://doi.org/10.1371/journal.pone.0083558

Kwon, M., Lee, J.Y., Won, W.Y., Park, J.W., Min, J.A., Hahn, C., Gu, X., Choi, J.H., & Kim, D.J. (2013a). Development and validation of a Smartphone Addiction Scale (SAS). *PLoS ONE, 8*(2). https://doi.org/10.1371/journal.pone.0056936

Lin, Y.H., Lin, S.H., Yang, C.C.H., & Kuo, T.B.J (2017). Psychopathology of everyday life in the 21st century: Smartphone addiction. In C. Montag (Ed.), *Internet addiction: neuroscientific approaches and therapeutical implications including smartphone addiction* (pp. 339–358). Springer.

Mahapatra, S. (2019). Smartphone addiction and associated consequences: Role of loneliness and self-regulation. *Behaviour & Information Technology, 38*(8), 833-844. https://doi.org/10.1080/0144929X.2018.1560499

Mascheroni, G., & Olafsson, K. (2016). The mobile Internet: Access, use, opportunities and divides among European children. *New Media & Society, 18*(8), 1657-1679. https://doi.org/10.1177/14614448145679

Olson, J.A., Sandra, D.A., Colucci, E.S., Bikaii, A.A., Chmoulevitch, D., Nahas, J., Raz, A., & Veissiere, S.P.L. (2022). Smartphone addiction is increasing across the world: A meta-analysis of 24 countries. *Computers in Human Behavior*, *129*. https://doi.org/10.1016/j.chb.2021.107138

Panova, T., & Carbonell, X. (2018). Is smartphone addiction really an addiction? *Journal of Behavioral Addictions, 7*(2), 252–259. https://doi.org/10.1556/2006.7.2018.49

Samaha, M., & Hawi, N.S. (2016). Relationships among smartphone addiction, stress, academic performance, and satisfaction with life. *Computers in Human Behavior, 57*, 321–325. https://doi.org/10.1016/j.chb.2015.12.045

Shahidin, S.H., Midin, M., Sidi, H., Choy, C.L., Nik Jaafar, N.R., Mohd Salleh Sahimi, H., & Che Roos, N.A. (2022). The relationship between emotion regulation (ER) and problematic smartphone use (PSU): A systematic review and meta-analyses. *International Journal of Environmental Research and Public Health, 19*(23). https://doi.org/10.3390/ijerph192315848

Sohn, S.Y., Rees, P., Wildridge, B., Kalk, N.J., & Carter, B. (2019). Prevalence of problematic smartphone usage and associated mental health outcomes amongst children and young people: a systematic review, meta-analysis and GRADE of the evidence. *BMC Psychiatry, 19*(356). https://doi.org/10.1186/s12888-019-2350-x

Squires, L.R., Hollett, K.B., Hesson, J., & Harris, N. (2021). Psychological distress, emotion dysregulation, and coping behaviour: A theoretical perspective of problematic smartphone use. *International Journal of Mental Health and Addiction, 19*(4), 1284-1299. https://doi.org/10.1007/s11469-020-00224-0

Steinberg, L. (2022). *Adolescence*. McGraw Hill.

Şata, M., & Karip, F. (2017). Turkish culture adaptation of Smartphone Addiction Scale-short version for adolescents. *Cumhuriyet International Journal of Education, 6*(4), 426–440. https://doi.org/10.30703/cije.346614

TÜİK (2024). Çocuklarda bilişim teknolojileri kullanım araştırması, 2024 [Information technology usage survey in children, 2024]. https://data.tuik.gov.tr/Bulten/Index?p=Cocuklarda-Bilisim-Teknolojileri-Kullanim-Arastirmasi-2024-53638

Urfa, O. (2024). A conditional process model to explain problematic smartphone use: The interaction among frustration intolerance, duration of use, and gender. *Psihologija, 57*(2), 215-226. https://doi.org/10.2298/PSI220627017U

van der Schuur, W.A., Baumgartner, S.E., Sumter, S.R., & Valkenburg, P.M. (2015). The consequences of media multitasking for youth: A review. *Computers in Human Behavior, 53*, 204–215. http://dx.doi.org/10.1016/j.chb.2015.06.035

WHO (1998). *Wellbeing measures in primary health care/the depcare project*. WHO Regional Office for Europe: Copenhagen.

Yıldız, M.A., & Duy, B. (2014). Adaptation of the short-form of the UCLA Loneliness Scale (ULS-8) to Turkish for the adolescents. *Düşünen Adam the Journal of Psychiatry and Neurological Sciences, 27*, 194–203. https://doi.org/10.5350/DAJPN2014270302

APPENDICES

Appendix 1. *English items of the SPS.*

i1 - At dinner with your family
i2 - while you are spending time with your friends
i3 - while you are studying
i4 - during the night, if you wake up
i5 - First thing in the morning, when you wake up
i6 - At school, during the lessons
i7 - While you are watching a movie or a TV show

Appendix 2. *Turkish items of the SPS.*

i1 - Ailenizle akşam yemeği yerken
i2 - Arkadaşlarınızla vakit geçirirken
i3 - Ders çalışırken
i4 - Gece, uyandığınızda
i5 - Sabahın ilk saatlerinde, uyandığınızda
i6 - Okulda, ders sırasında
i7 - Bir film veya TV programı izlerken