The mediating role of social ostracism in the effect of social media addiction on loneliness in adolescents

Necmettin Çiftci [a,*], Metin Yıldız [b], Kamile Çiftci [c]

[a] Muş Alparslan University, Faculty of Health Sciences, Department of Nursing, 49100 Muş, Turkey
[b] Sakarya University, Faculty of Health Sciences, Department of Midwifery, 54100 Sakarya, Turkey
[c] Muş Alparslan University, Vocational School of Health Services, Department of Medical Services and Techniques, 49100 Muş, Turkey

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ABSTRACT

Objective: This study aimed to determine the mediating role of social ostracism in the effect of social media addiction on loneliness in adolescents.

Methods: This descriptive and cross-sectional study was conducted with 1225 adolescent students attending high school in a province in Eastern Turkey between 30 May 2023 and 01 August 2023. The study data were collected using the "Personal Information Form", "Bergen Social Media Addiction Scale", "UCLA Loneliness Scale-Short Form" and "Ostracism Experience Scale for Adolescents". The analysis of the study data was performed by using SPSS 22.0, AMOS V 24.0, and G*Power 3.1 Statistical package software.

Results: It was determined that the model created in line with the determining the mediating role of social ostracism in the effect of social media addiction on loneliness in adolescents was compatible and the model fit indices were within the desired limits $x^2/df = 4.481$, RMSEA = 0.05, CFI = 0.96, GFI = 0.96, AGFI = 0.94, IFI = 0.96. Social media addiction has been found to affect loneliness and social ostracism ($p < 0.05$). It was found that social ostracism affected the level of loneliness ($p < 0.05$). It was determined that social ostracism had a mediating role in the effect of social media addiction on loneliness ($p < 0.05$).

Conclusion: As the level of social media addiction increases, the level of loneliness and social ostracism increases. As the level of social ostracism increases, the level of loneliness increases. Longitudinal studies on the factors affecting loneliness are recommended.

Practice implications: In order to reduce the loneliness and social ostracism levels of adolescents, their access to social media should be controlled. Programs to reduce social ostracism should be designed.

Introduction

Social media usage has become a part of our daily lives, and the largest user group consists of adolescents and young adults (Marengo et al., 2020; Settanni et al., 2018). Social media is defined as "any interactive communication channel that allows for two-way interaction and feedback" (Kent, 2010). Social media use is expressed as a concept that encompasses Internet-based networking activities that enable individuals to interact with others verbally and visually (Carr & Hayes, 2015). Social media has tremendous potential to allow personality to express itself and maintain contact with a network of friends (Radovic et al., 2017). With the increase in access to the Internet and the development of technological devices (smart phones, computers, tablets, etc.) over time, it is seen that the use of the internet and social media is rapidly becoming widespread among adolescents (Bilgin et al., 2020). However, the excessive use of social media platforms has recently been identified as a behavioral addictive disorder because of its potential negative consequences on users' individual relationships and professional lives (Andreassen & Pallesen, 2014; Guedes et al., 2016). Social media addicts tend to use social media to cope with recurring negative emotions and thoughts related to personal issues, to alleviate anxiety and stress, and to cope with depressive feelings (Andreassen et al., 2016; Koç & Gülyağcı, 2013). Excessive use of social media leads to increased stress, diminished sense of belonging, depressive mood, and elevated levels of loneliness (Aalbers et al., 2019; Van Rooij et al., 2017).

Loneliness is a subjective negative emotion that results from a mismatch between the level of meaningful social relationships a person desires and what they perceive to have (Bone et al., 2023). Although

* Corresponding author at: PHD Muş Alparslan University, Faculty of Health Sciences, Department of Nursing, 49100 Muş, Turkey.
E-mail address: n1.ciftci@alparslan.edu.tr (N. Çiftci).

loneliness is a condition that can be felt in every period of life, this feeling is more experienced during adolescence and is quite common (Lodder et al., 2016; Qualter et al., 2015). Some studies indicate that the feeling of loneliness is a predictor of more intensive use of social media (Aalbers et al., 2019; Kross et al., 2013).

Social ostracism is defined as being ignored and excluded by others (Williams, 2007). Social ostracism, which many individuals commonly experience, is a condition that can be observed in every phase of life (Ahmet et al., 2016; Williams, 2007). Especially during adolescence, when individuals are more socially sensitive, this situation is very commonly observed (Eisenberger, 2006). It is emphasized that social ostracism is a significant risk factor for the healthy development and adaptation of the individual (Arslan & Yıldırım, 2022). Socially ostracized adolescents experience negative feelings such as jealousy, anxiety, grief, and loneliness (Arslan & Duru, 2017). Some studies have indicated that social ostracism is associated with loneliness and that lonely adolescents experience more exclusion than those who are not alone (Büyükcebeci & Deniz, 2017; Vanhalst et al., 2015). This study is an original research investigating whether social media addiction and social ostracism, which are among the factors affecting loneliness, have a mediating role. In addition, the importance of the study increases in a period when more loneliness, social media addiction and social ostracism are seen in adolescents. It is considered that this study will contribute to the literature and will pave the way for future studies.

Hypotheses examined in the Structural Equation Modeling (SEM) established in the study (Figs. 1, 2):

H_1. There is a significant relationship between social media addiction and loneliness.

H_2. There is a significant relationship between social media addiction and social ostracism.

H_3. There is a significant relationship between social ostracism and loneliness.

H_4. Social ostracism has a mediating role in the effect of social media addiction on loneliness.

Method

Type and time of the study

This cross-sectional descriptive study was conducted with adolescent students between May 30, 2023, and August 01, 2023.

The universe and the sample of the study

The universe of the study consisted of adolescents attending high school in a province in Eastern Turkey. It was determined that there were a total of 23 high schools in the city center where the study was conducted. According to the school reports in the region where the study was conducted, there were a total of 13,567 students. The minimum number of individuals that should be included in the research sample, calculated using the known population sample formula at a 95% confidence interval ($d = 0.05$), $t = 1.96$, $p = 0.5$, $q = 0.5$, was found to be 374. In our study, a sampling method was not employed, and all adolescents who agreed to participate were included in the study. In our study, a total of 1225 adolescent students in the age group of 14–18 were
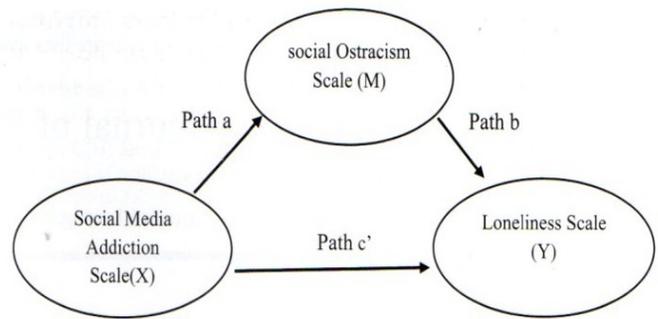

Fig. 2. Structural equation model predicted between social media addiction, social ostracism scale and loneliness.

included. Following the study, a post hoc power analysis was conducted based on the results obtained from 1225 participants, revealing that the study's power is 99% at a medium effect size and a 95% confidence level (Cohen, 1988). The STROBE guideline was used in the reporting of this research paper (Vandenbrouckel et al., 2007).

Inclusion criteria

All students who volunteered to participate in the study, were aged between 14 and 18, and did not have any illness that would prevent them from completing the questionnaire were included in the study.

Exclusion criteria

The data of the students who did not accept to participate in the study and the students who left the study data unfinished and did not fill in the questionnaire and scale questions were excluded from the study.

Data collection tools

The study data were collected using the "Personal Information Form", "Bergen Social Media Addiction Scale", "UCLA Loneliness Scale-Short Form" and "Ostracism Experience Scale for Adolescents".

Personal information form

The personal information form prepared by the researchers consists of 6 questions (gender, age, class, family income status, school achievement status, and average time spent on social media) in total.

Bergen social media addiction scale

The Bergen Social Media Addiction Scale was developed by Andreassen et al., (Andreassen et al., 2017). The scale's initial validity in Eastern Europe was conducted by Stănculescu in 2022 (Stănculescu, 2023). The Turkish language adaptation was made by Demirci in 2019 (Demirci, 2019). The scale consists of one dimension and six items. Each item in the scale corresponds to six core characteristics of addiction: salience, mood modification, tolerance, withdrawal, conflict, and relapse. The scale items are answered according to a five-point Likert-type rating ranging from (1) very rare to (5) quite often. The scores that can be obtained from the scale range from 6 to 30. There is no reverse-scored item in the scale. An increase in the score obtained from the scale
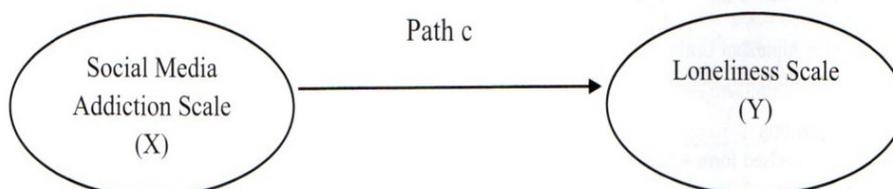

Fig. 1. Simple impact model.

indicates an increase in social media addiction. The internal consistency of the scale was found to be 0.83 (Demirci, 2019). In our study, Cronbach Alpha value was found to be 0.86. Bergen Social Media Addiction Scale fit indices were determined as $x^2/Sd = 1.991$, RMSEA = 0.028, CFI = 0.99, GFI = 0.99, AGFI = 0.98, IFI = 0.99, TLI = 0.99 and the structure of the scale was confirmed (Karagöz, 2019) (Fig. 3).

UCLA loneliness scale-short form

The UCLA Loneliness Scale Short-Form was developed by Hays and DiMatte (Hays & DiMatteo, 1987). The scale was adapted into Turkish by Yıldız and Duy (Yıldız & Duy, 2014). The scale consists of a single dimension and 7 items. The response format of the scale is structured in a four-point structure as follows: "(1) Never, (2) Rarely, (3) Sometimes, and (4) Always." The 5th item of the scale is reverse scored. By summing up the scores from the 7 items of the scale, an overall loneliness score is obtained. The lowest score that can be obtained from the scale is 7 and the highest score is 28. Accordingly, the low scores of adolescents indicate the low sense of loneliness experienced, while the increase in the score indicates an increase in the intensity of the feeling of loneliness experienced. The Cronbach Alpha reliability value of the scale was found to be 0.74. In our study, Cronbach Alpha value was found to be 0.83. The construct validity of the UCLA Loneliness Scale was tested through confirmatory factor analysis. According to the results of the analysis, the fit indices were determined as $x^2/df = 4.258$, RMSEA = 0.05, CFI = 0.99, GFI = 0.98, AGFI = 0.97, IFI = 0.99, TLI = 0.98 and the construct validity of the scale was confirmed (Karagöz, 2019) (Fig. 4).

Ostracism experience scale for adolescents

The Ostracism Experience Scale for Adolescents was developed by Gilman et al. (Gilman et al., 2013) to assess an individual's perceptions of being excluded or ignored from a social group. The scale was adapted into Turkish by Ahmet et al., (Ahmet et al., 2016). The scale consists of 11 items. The scale has a 5-point rating scale ("1" Never, "2" Rarely, "3" Sometimes, "4" Often, "5" Always). The scale consists of two sub-dimensions: the disregard sub-dimension (items 1, 2, 3, 4, and 5) and the ostracism sub-dimension (items 6, 7, 8, 9, 10, and 11). Items 6–11 are reverse-coded. The scale gives both sub-dimensions and total points. The highest score that can be obtained from the scale is 55 and the lowest score is 11. High scores indicate a high level of social ostracism perception. The Cronbach Alpha reliability value of the scale was found to be 0.89 (Ahmet et al., 2016). In our study, Cronbach Alpha value was found to be 0.72. The construct validity of the Ostracism Experience Scale for Adolescents was tested through confirmatory factor analysis. According to the results of the analysis, the fit indices were determined as $x^2/df = 4.789$, RMSEA = 0.05, CFI = 0.98, GFI = 0.97, AGFI = 0.95,
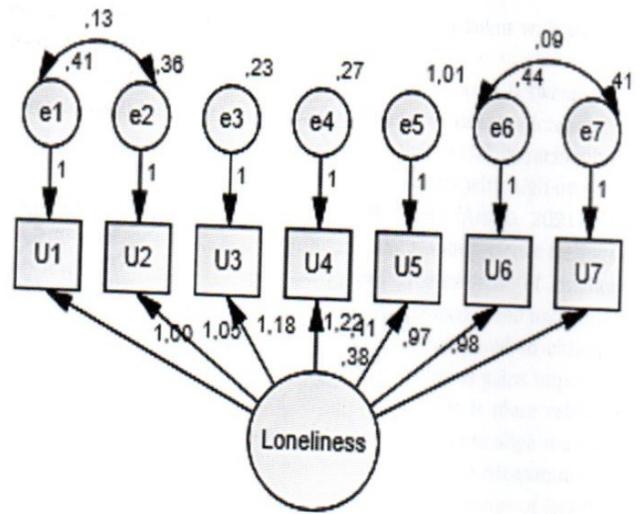

Fig. 4. UCLA loneliness scale.

IFI = 0.98, TLI = 0.97 and the construct validity of the scale was confirmed (Karagöz, 2019) (Fig. 5).

Data collection

The study data was collected online using Google Forms. The prepared survey link was sent to adolescents via e-mail, WhatsApp, and telegram. The confidentiality of the survey data is ensured. Forms are standardized to respond only once from each phone/tablet/computer. Data was collected from the study participants with informed consent, adhering to data privacy principles. Participants were asked to approve this form before starting the study. The study data were collected using the "Personal Information Form", "Bergen Social Media Addiction Scale", "UCLA Loneliness Scale-Short Form", and "Ostracism Experience Scale for Adolescents".

Data analysis

The analysis of the study data was performed by using SPSS 22.0, AMOS V 24.0, and G*Power 3.1 Statistical package software. Percentage, arithmetic mean, standard deviation, minimum and maximum values were calculated using SPSS 22.0. In the examination of the multivariate normal distribution of variables, kurtosis and skewness values were examined. For a multivariate normal distribution, the skewness value is desired to be in the range of -2 and $+2$, and the kurtosis value is desired to be in the range of -10 and $+10$ (Collier, 2020). It was determined that the skewness value was in the range of -0.014-0.322, and the kurtosis value was in the range of -0.269-/ 1.074. Therefore, multivariate normal distributions were provided for the variables.

AMOS V 24.0 software was used to perform the SEM analysis. In the study, $p < 0,05$ was considered statistically significant. SEM is a multivariate statistical method that allows for testing multiple relationships simultaneously and calculates causality relationships between variables by modeling (Collier, 2020; Gürbüz, 2021). Upon examining assumptions, it was determined that the study with a sample size of 1225 falls into the category of a large sample size, which is typically considered to be above 200 samples (Collier, 2020), for SEM. Many parameters are examined for multicollinearity between variables. In the field of nursing, correlation, tolerance, and variance inflation factor (VIF) are among the values examined (Lee & Lee, 2022; Mottaghi et al., 2019; Yoon et al., 2021). In the study, tolerance values ranging from 1.00 to 0.973 (>0.10) and VIF values ranging from 1.000 to 1.028 (<10) were determined for the dependent and independent variables. According to these value ranges, it was found that there was no multicollinearity between dependent and independent variables. When determining the outliers, the Mahalonobis distance and p1/p2 values were examined and no
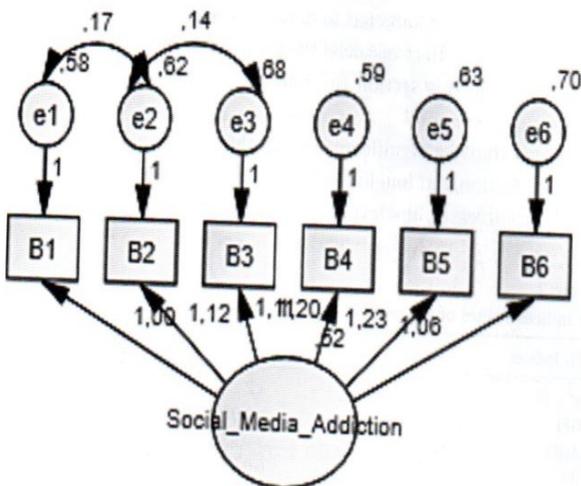

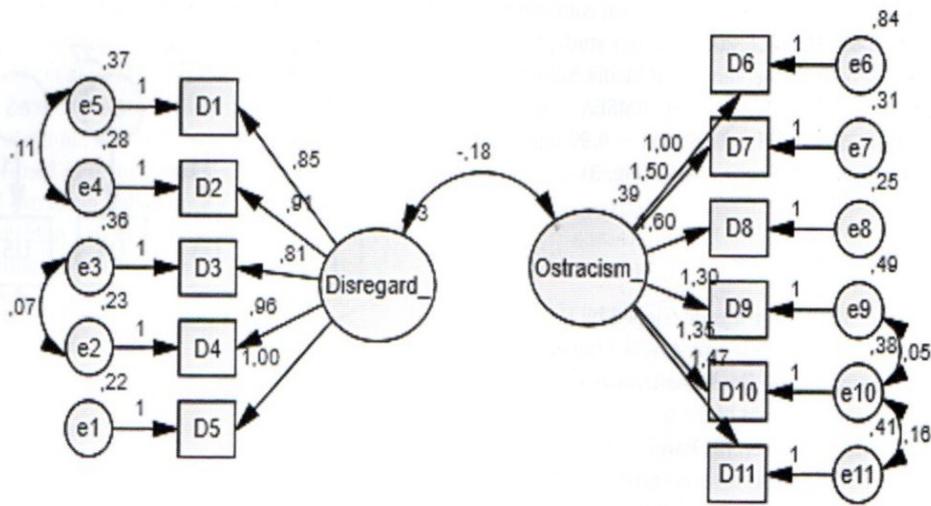**Fig. 3.** Bergen social media addiction scale.

Fig. 5. Social ostracism experience scale for adolescents.

outliers were found. The reliability of the variables is tested before the SEM is tested. In the study, Cronbach Alpha coefficient (>0.60) (Hu & Bentler, 1999; Karagöz, 2019) values of the scales were determined and the reliability of the variables was tested. Cronbach Alpha coefficients of the measurement instruments were determined to be in the range of 0.72–0.86.

Ethical principles of the study

The study was approved by the Scientific Research and Publication Ethics Committee of a University (Date and Number: 5/18/ 2023–93324). After the ethical approval was obtained, institutional permissions were obtained so that the study could be carried out in educational institutions. The students who will participate in the study were informed by the researcher about the purpose and methodology of the study, the time they will allocate for participation, the fact that participation would not cause any harm, and that participation was completely voluntary. Their consent was obtained based on this information. Since individual rights should be protected in the study, the Helsinki Declaration on Human Rights was adhered to throughout the study.

Findings

It was determined that 52.0% of the participants in the study were female, 25.4% were in the 10th grade, 80.0% had income equivalent to expense, and 72.2% had a perceived moderate level of school achievement. The mean age of participants was 15.58 ± 1.18 (years), and the

mean time spent on social media (hours) was 4.24 ± 2.19 (Table 1).

Structural Equation Modeling (SEM)

After providing assumption analyses and determining that the measurement tools are valid and reliable, a structural equation model was established to determine the relationship between the scales.

It was determined that the model created in line with the hypotheses was compatible and the model fit indices were within the desired limits $x^2/Sd = 4.481$, RMSEA = 0.05, CFI = 0.96, GFI = 0.96, AGFI = 0.94, IFI = 0.96 (Karagöz, 2019) (Table 2).

As a result of the model;

H_1. "There is a significant relationship between social media addiction and loneliness" was confirmed ($p < 0.05$) and the H_1 was accepted (Figs. 6,7; Table 3). As the level of social media addiction increases, the level of loneliness increases.

H_2. "There is a significant relationship between social media addiction and social ostracism" was accepted (Fig. 6; Table 3). As social media addiction increases, the level of social ostracism increases.

H_3. "There is a significant relationship between social ostracism and loneliness" ($p < 0.05$) was accepted (Fig. 6; Table 3). As social ostracism increases, the level of loneliness increases.

H_4. "The social ostracism has a mediating role in the effect of social media addiction on loneliness" was confirmed ($p < 0.05$) and the H_4 was accepted (Fig. 6; Table 3).

Discussion

This study was conducted to determine the mediating role of social ostracism in the effect of social media addiction on loneliness in adolescents and in this section the findings are discussed in light of the literature.

In our study, a significant relationship was found between social media addiction and loneliness ($p < 0.05$). As the level of social media addiction increases, the level of loneliness increases. As the time spent

Table 1
Demographic characteristics of participants ($n = 1225$).

Demographic Characteristics		n	%
Gender	Female	637	52.0
	Male	588	48.0
Class	9Th Grade	305	24.9
	10th Grade	311	25.4
	11th Grade	304	24.8
	12th Grade	305	24.9
Monthly income status	Income less than expenses	153	12.5
	Income equal to expenses	980	80.0
	Income more than expenses	92	7.5
Perceived Academic Success Level	Low	108	8.8
	Moderate	884	72.2
	High	233	19.0
	$\overline{X} \pm$ SD (**Min-Max**)		
Age (Years)	$15.58 \pm 1.18 (14\text{–}18)$		
Duration of Social Media Usage (Hours)	$4.24 \pm 2.19 (0\text{–}12)$		

Table 2
Fit indices values of the model.

Fit Indices	Research Model	Normal Value	Acceptable Value
χ^2 / df	4.481	<2	<5
GFI	0.96	>0.95	>0.90
AGFI	0.94	>0.95	>0.85
IFI	0.96	>0.95	>0.90
CFI	0.96	>0.95	>0.90
RMSEA	0.05	<0.05	<0.08
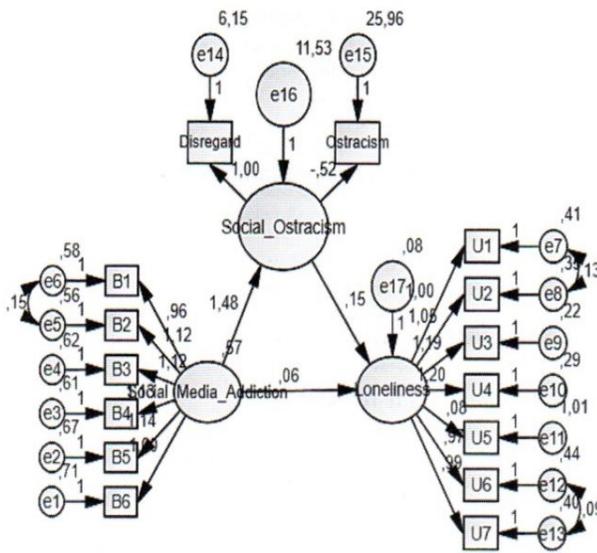
x²/Sd=4.481, RMSEA=0.05, CFI=0.96, GFI=0.96, AGFI=0.94, IFI=0.96, TLI=0.95

Fig. 6. SEM diagram showing the relationship between social media addiction, social ostracism scale and loneliness.

on social media increases, loneliness increases. For lonely individuals, social media is perceived to be as important as parental and peer support (Wright et al., 2018). Bayram and Gündoğmuş examined the relationship between social media addiction and loneliness of individuals and determined that students who used social media and spent >3–4 h a day on social media were more lonely than those who spent less time (Bayram & Gündoğmuş, 2016). Similar studies had determined that excessive Internet usage can harm relationships among individuals and lead to a form of loneliness based on disruptions in daily life and social interactions (Çakır & Ebru, 2017; Moretta & Buodo, 2020). Our study results are consistent with the literature. The fact that social media addiction causes loneliness in adolescents and causes different problems indirectly increases the importance of the issue.

In our study, a significant relationship was found between social media addiction and social ostracism (p < 0.05). As social media addiction increases, the level of social ostracism increases. This result of the study is consistent with the literature (Esen, 2010; Öztosun, 2018). Similarly, Hawk et al., (Hawk et al., 2019), in their longitudinal study with 307 adolescents, found that adolescents spent more time on social media to escape social ostracism and seek attention, but as a result, they

exhibited destructive behaviors. This result is consistent with the findings of our study.

In our study, a significant relationship was found between social ostracism and loneliness (p < 0.05). As social ostracism increases, the level of loneliness increases. Arslan found that social ostracism has a strong effect on loneliness. In addition, adolescents with high ostracism experiences have been found to feel more lonely (Arslan, 2021). Adolescents who experience social ostracism may also experience feelings of loneliness. Adolescents often experience a greater sense of loneliness when alone compared to adults, due to the increased speed and number of areas of change they need to adapt to, as compared to childhood (Duck, 1986). Theoretically, the feeling of loneliness gains importance in adolescence. An individual's sense of loneliness is more related to whether the qualities of the relationships they possess align with their personal ideals, rather than the number of friends and companions they have. In this regard, adolescents experience such feelings of loneliness more than adults (Çeçen, 2007). Previous studies have found that adolescents experiencing social ostracism exhibit higher and significant levels of depression, loneliness, and feelings of inadequacy when compared to adolescents with healthy and sufficient social relationships (Witvliet et al., 2010). The most different study on social ostracism is the experimental study to embody whether social ostracism and loneliness can be characterized by the concept of cold. In songs, poems, and similar

Table 3
The relationship between social media addiction, social ostracism and loneliness.

	Result Variables			
	Social Ostracism		Loneliness	
	β	S.E.	β	S.E.
Social Media Addiction (Path c)			0.285	0.029
p/ R²			0.001/0.119	
Social Media Addiction (Path a)	1.479	0.179		
p/ R²	0.001/ 0.097			
Social Ostracism (Path b)			0.149	0.014
p/ R²			0.001/0.785	
Social Media Addiction (Path c')			0.064	0.029
Effect		β	95% Confidence Interval (Lower Bound-Upper Bound)	
Indirect effect		0.220	0.156/0.302	
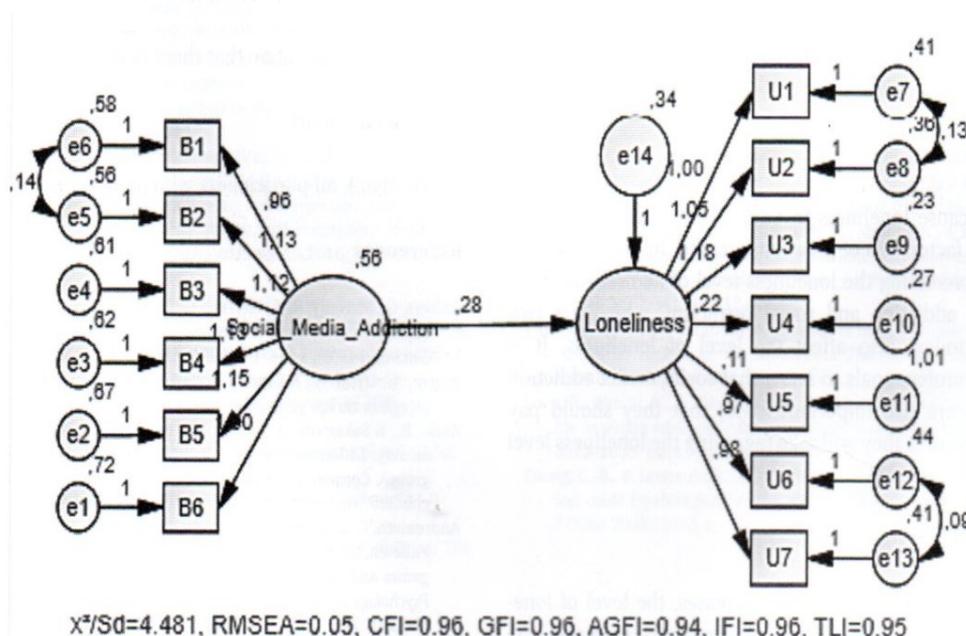
X²/Sd=4.481, RMSEA=0.05, CFI=0.96, GFI=0.96, AGFI=0.94, IFI=0.96, TLI=0.95

Fig. 7. Simple impact model.

forms of expression, individuals experiencing loneliness and ostracism often use the metaphor of feeling cold to convey their emotions. As a result of the experimental study carried out to prove that this is not just a metaphor, it was found that individuals who experience social ostracism and see themselves as lonely perceive the same room temperature as lower and feel colder than individuals who do not experience ostracism, and they are more inclined to hot drinks (Zhong & Leonardelli, 2008). This situation demonstrates the relationship between social ostracism and loneliness, indicating the physiological and psychological impacts on an individual.

The hypothesis that social ostracism has a mediating role in the effect of social media addiction on loneliness has been confirmed ($p < 0.05$) and H_4 was accepted. Williams argued that the four basic needs of individuals exposed to social ostracism– belonging, self-esteem, control, and meaningful existence – are threatened. Therefore, individuals take action to meet these basic needs (Williams, 2007). To fulfill their one of fundamental needs, which is to belong, individuals according to Maner et al.'s (Maner et al., 2007) "reconnection hypothesis" engage in new quests to establish social relationships. These individuals, who become more inclined to establish new social networks, make new friends, and engage in group collaborations, often tend to lean towards social media as their primary choice since they believe they can maintain control over it. The emotions that individuals who are exposed to social ostracism often feel are loneliness and lack of social support (Bozoglan et al., 2013). According to studies examining the reasons for social media usage among individuals who experience feelings of loneliness (Ando & Sakamoto, 2008; Wang et al., 2011), individuals primarily turn to social media with the aim of alleviating their feelings of loneliness. Peer relationships, family relationships, and teacher-student relationships are the areas where social ostracism is most keenly felt. When individuals do not find enough support in these relationships, they may feel isolated. In a study conducted by Wang et al. (Wang et al., 2011) in China, the absence of healthy relationships with peers, family, and teachers among students was reported as a significant risk factor for problematic Internet usage. It can be stated that the belief that they can more easily control situations such as physical characteristics, ethnicity, and face-to-face interaction concerns which may cause social ostracism or the belief of enabling individuals to create their own world by creating a different image and hiding these situations is effective in their orientation to social media and virtual world.

Limitations

There may be some possible limitations in this study. The limitation of the study is that the participants in the study were selected from only one province. Furthermore, due to the use of a cross-sectional design, causal inferences cannot be drawn from this study.

Implications to practice

The factors that cause loneliness in adolescence and the solution suggestions for these factors are of great importance. In our study, two important variables predicting the loneliness level of adolescents were found. Social media addiction and social ostracism, which are two important concepts today, also affect the level of loneliness. It is important for health professionals to know that social media addiction and social ostracism are two important issues that they should pay attention to in the measures they will take regarding the loneliness level of adolescents.

Conclusion

As adolescents' social media addiction increases, the level of loneliness and social ostracism increases. As social ostracism increases, the level of loneliness increases. It was determined that social ostracism has a mediating role in the effect of social media addiction on loneliness.

Longitudinal studies on the factors affecting loneliness are recommended.

Ethical principles of the research

Approval was obtained from Muş Alparslan University Scientific Research and Publication Ethics Committee for the research (Date and Number: 18/05/2023-93324) was performed. Verbal consent to participate in the research was obtained from the individuals by giving information about the purpose of the research, the method, the time they would spare for the research, and by declaring that participating in the research would not do any harm and that the participation was completely voluntary.

Consent to participate

Written informed consent was obtained from the students participating in the study with the Voluntary Consent Form.

Consent for publication

Publication permission was obtained from the participants.

Author contributions

Study design: Çiftci Necmettin, Yıldız Metin, Çiftci Kamile.
Data collection: Çiftci Necmettin, Yıldız Metin, Çiftci Kamile.
Data analysis: Çiftci Necmettin, Yıldız Metin, Çiftci Kamile.
Manuscript writing: Çiftci Necmettin, Yıldız Metin, Çiftci Kamile.

CREDIT statement

No credit status.

Declaration of Competing Interest

The authors declare that there is no conflict of interest.

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