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The relationship of Facebook, Instagram, Twitter, TikTok and WhatsApp/Telegram with loneliness and anger of adolescents living in Turkey: A structural equality model

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ABSTRACT

Purpose: The aim of this study is to determine the relationship of social media with loneliness and anger levels of adolescents living in Turkey.
Design and methods: This study used a cross-sectional descriptive design. Loneliness and anger were measured with "University of California, Los Angeles Loneliness Scale" and "Adolescent Anger Rating Scale". Data collection forms were prepared on Google Form and form' link was sent to adolescents.
Results: A total of 1176 adolescents aged 13–18 years within four high schools were included. The results obtained show use of Facebook and duration of Facebook use of adolescents were not related to mean scores of loneliness. Adolescents with high duration of Instagram use was to be found that loneliness scores were statistically high, but anger scores were similar. Twitter users had lower loneliness mean scores and higher anger scores. TikTok use was not related with loneliness scores.
Conclusion: In conclusion, this study found that high duration of Instagram use was associated with higher loneliness scores in adolescents, while Twitter users had lower loneliness scores and higher anger scores. The use of Facebook and TikTok did not significantly affect loneliness and anger levels.
Practice implications: This study suggest that pediatric nurses can play a significant role in promoting balanced social media use and healthy coping strategies to mitigate the negative impact of excessive social media use on adolescent mental health. Pediatric nurses can support adolescent emotional wellbeing and promote a healthier digital environment.

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Introduction

The last decade has seen a significant increase in the use of social media tools due to the development of technology (Turel et al., 2018). Currently, 58.4% of the world's population is a social media user, with an average daily usage time of 147 min (Chaffey, 2022). In the United States of America, a study reports that 25% of adolescent users constantly used social media online in 2015, increasing to 45% in 2018 (Anderson & Jiang, 2018). Similarly, in Turkey, 73.8% of individuals in the 16–74 age group are social media users, with a rate of internet use of 82.7% for children aged 6–15 years (Turkish Statistical Institute, 2021; Turkish Statistical Institute, 2022).

Social media has become a communication platform for individuals of all ages since the 2000s (Perrin & Anderson, 2019). These platforms are used for various purposes, including communication, entertainment, listening to music, personal presentation, exchanging ideas, and accessing information (Çömlekçi & Başol, 2019). Adolescents, in particular, use social media for these reasons and to meet new people, follow events, and socialize (Barry et al., 2017; Smith & Anderson, 2018). While the use of social media has positive outcomes such as cooperation and sharing, uncontrolled use can have negative consequences such as decreased communication in real life, addiction, depression, anxiety, and loneliness (Mammadzade et al., 2020; Sheldon, 2012).

Studies reveal that social media use is related to loneliness and anger (Çakır & Oğuz, 2017). Some adolescents spend more time on social media platforms due to the loneliness they experience, while others become isolated from society due to excessive use, leading to further loneliness (Ektiricioğlu et al., 2020). Anger also has the potential to spread quickly on social media, as it can be freely expressed online and gets more likes (Das & Sahoo, 2011; Pittman & Reich, 2016). Likes and shares that cause anger in adolescents may further increase their use of social media platforms (European Commission, 2021). Thus, the aim of this study is to examine the relationship between social media use,

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loneliness, and anger levels in Turkish adolescents. The research questions guiding the study include:

1) What is the social media usage rate among adolescents?
2) What is the relationship between the duration of social media use and adolescents' loneliness and anger levels?
3) What is the relationship between adolescents' social media use and their loneliness and anger levels?

Methods

Study design

This study was designed as a cross-sectional descriptive model to determine relationship of social media with loneliness and anger in adolescents.

Participants

The study was conducted in a city located in eastern Turkey. There were four different types of high schools (vocational, science, Anatolian, and religious high schools), which were clustered according to their types. A school was selected from each cluster, and adolescents were included using a random sampling method. The study population consisted of adolescents aged 13–18 years. According to the school reports in the region where the study was conducted, there were a total of 8210 students. In this study, a sample of 957 people was deemed sufficient with a 99.90% confidence interval and 5% margin of error, calculated using OpenEpi (Sullivan et al., 2009).

Inclusion criteria

- Being between the ages of 13–18 years,
- Agreeing to participate in the study voluntarily. Prior to any data collection, assent or informed consent was collected from each participant.

Exclusion criteria

- Having a physical disability (hearing, motor, visual) that cannot answer the questions,
- Declined to participate in the study.

Data collection tools

"Sociodemographic Form", "University of California, Los Angeles (UCLA) Loneliness Scale" (Russell et al., 1980), "Adolescent Anger Rating Scale" (McKinnie Burney & Kromrey, 2001), and "Social Media Attitude Questionnaire" were used to collect data.

Sociodemographic form

This form consists of questions prepared to determine the characteristics of adolescents such as age, gender, family type, academic degree and success, presence of chronic illness.

University of California, Los Angeles Loneliness Scale

The UCLA Loneliness Scale was developed by Russell, Peplau, and Ferguson in 1978 and revised 1980 (Russell et al., 1980) and finally by Russell in 1996 (Russell, 1996). The scale, prepared in a 4-point Likert type, consists of 20 statements reflecting how lonely people describe their lives. Scoring of 10 items in the scale (1, 5, 6, 8, 9, 10, 15, 16, 19, 20) is done by reversing. Other items of the scale are scored straight. The lowest score that can be obtained from the scale is 20, and the highest score is 80. A high score from the scale indicates a high level of loneliness, and a low score indicates a low level of loneliness. In addition, the continuous scores obtained are classified as low scores between 20 and 34 as low, scores between "35–48" as moderate, and scores of "49 and above" as high degree of loneliness. The Turkish adaptation, validity and reliability studies of the scale were first performed by Yaparel in 1984 (Yaparel, 1984). The measure was found to be valid and reliable among the Turkish population (Cronbach's alpha = 0.96). Cronbach alpha confidence of UCLA Loneliness Scale was calculated as 0.76 in this study.

Adolescent Anger Rating Scale

The Adolescent Anger Rating Scale (AARS) was developed by McKinnie Burney and Kromrey in 2001 for adolescents aged 11–19 years (McKinnie Burney & Kromrey, 2001). The scale, which is a four-point Likert type, consists of 41 questions with a response scale ranging from "hardly ever" to "very often". Scores are reported for total anger and for three subscales measuring aspects of the adolescent's typical anger response pattern: "reactive anger", "instrumental anger", and "anger control" sub-dimensions. Total anger scores are calculated from the scale.

Reactive anger (20 items) is an angry, sudden reaction to an event that creates fear, threat, or a negative emotion.

Instrumental anger (8 items) is a negative emotion that triggers a delayed response that results in a planned, willing revenge behavior. Anger control (13 items) is a cognitive and behavioral method used to resolve the anger response. Coefficient alphas for the AARS were 0.70, 0.83, and 0.80, respectively, for reactive, instrumental, and anger control (McKinnie Burney & Kromrey, 2001). Cronbach alpha reliability coefficient of AARS was calculated as 0.78, 0.83, and 0.88 respectively in this study.

Social media questionnaire

Researchers created this questionnaire form based on the studies of Lou et al. (2012), Satici (2019), Błachnio et al. (2016). This questionnaire was to determine adolescents' use of social media, duration of use and purpose of use. Social media usage tools known to everyone were examined in the questionnaire. These tools are Facebook, Instagram, Twitter, TikTok and WhatsApp/Telegram, which are widely used in Turkey (Uslu, 2021).

Facebook is a social network that aims to communicate and exchange information with friends and other people. Facebook has been using for many years due to its features such as messaging, adding photos, sharing videos (Cataldo et al., 2022). Instagram is a photo and video sharing application. People can upload their photos or videos and share them with their followers or specific groups of friends. They can view, like and comment on the posts their friends have shared on Instagram. They can also shop on this platform (Cataldo et al., 2022). Twitter is a platform where people can learn what's going on in the world and what people are talking about (Cataldo et al., 2022). With the help of this application, instant tracking of famous people and social events in the world becomes easier. TikTok is a short-form video hosting service. It hosts a variety of short-form user videos, from genres like pranks, stunts, tricks, jokes, dance, and entertainment (Cataldo et al., 2022). WhatsApp/Telegram apps allow sending and receiving of various media such as instant text, photos, videos, documents and locations. They allow also voice and video calls (Rosenberg & Asterhan, 2018).

Application of data collection tools

A survey form created using the "Google Forms" application was utilized to collect the study data. The link of questionnaire form was sent to the participants via e-mail and WhatsApp (WhatsApp Inc. Menlo Park, CA). Data were obtained from individuals who participated in the online survey.

Prior to beginning the study, participants were asked to approve this form. To prevent multiple responses and ensure data integrity, the questionnaire was designed so that each participant could only fill it out once. "Google Forms" is Google's highly secure online form and survey creation program. After participants completed the form online, answers could only be accessed from the Google account of the researcher

who created the form. A copy of the collected data was stored on a password-protected computer, allowing only researchers to access it. The survey responses were anonymized, and the data was securely stored in Google Forms.

Data analysis

The data were evaluated electronically. Number, percentage, mean, standard deviation, *t*-test, ANOVA, Mann Whitney *U* test, Kruskal Wallis test values, and *p*-values were analyzed. In addition, Cronbach's alphas of the scale scores were calculated and their relationship with each other was examined using the Spearman test. To determine the effect of AARS on UCLA the, Structural Equation Modeling (SEM) (Kline, 2005) was used in Analysis of Moment Structures (AMOS) 23 application. The data were analyzed at a significance level of 0.05. Cronbach alpha was used to evaluate the internal consistency of the scales. There are conflicting reports about the acceptable values of alpha, ranging from 0.70 to 0.95 (Tavakol & Dennick, 2011).

Ethical approval

This study obtained approval from the obtained from the non-interventional ethics committee of Bingöl University (17.02.2022-E.51070). After obtaining ethical approval, institutional permissions were obtained through the governorship for the study to be carried out in schools. Researchers went to the classrooms and informed the adolescents about the purpose of the research. Then, survey link was shared with adolescents. Before starting the study, verbal and written consent was obtained from each adolescent. Those who agreed to participate in the study clicked on "I agree to participate in this study". The study was conducted according to the principles of research and publication ethics. According to Turkish laws, when permission is obtained from the governor's office and school administration, it is not necessary to get approval from the parents again. No data was gathered from the parents. The Declaration of Helsinki was adhered to throughout the study (World Medical Association, 2022). To protect data transmitted to Google Forms, only researchers were allowed access to the data. Private data of adolescents such as name and contact information were not collected.

Results

The study was completed with 1176 adolescents. The findings of the study, which were conducted to determine the relationship between social media and loneliness and anger levels in adolescents, were examined.

According to the study data, the majority of participants use WhatsApp/Telegram (92.2%), Instagram (73.6%), followed by Twitter (31.4%), Facebook (16.2%), TikTok (9.5%). The mean age of the adolescents was 15.56 ± 1.25 (Table 1). The use of Facebook and the duration of Facebook use by adolescents were not related to the mean scores of loneliness. However, the anger total and anger sub-dimension mean scores of using Facebook were higher. Similarly, adolescents with a high duration of Facebook use had higher anger total and anger sub-dimension scores, which were statistically significant. The use of Instagram was not statistically correlated with the loneliness and anger mean scores of the adolescents in the study. It was found that adolescents with a high duration of Instagram use had statistically high loneliness scores, but the anger scores were similar. When Twitter users were examined, Twitter users had lower loneliness mean scores and higher anger scores. The difference was found to be statistically significant. Adolescents with high Twitter usage did not differ in mean loneliness scores, but their anger mean scores were statistically high ($p < .05$, Table 2).

TikTok users were investigated, and it was found that TikTok use was not related to loneliness scores, but the mean scores of anger-reactive, anger-instrumental, and anger-total scores of these users were statistically higher. The duration of TikTok usage was not related to loneliness and anger scores. The loneliness mean scores of WhatsApp/Telegram users were statistically lower, but there was no difference in the anger mean scores. When the duration of WhatsApp/Telegram usage was examined, the adolescents who used these applications for 3 h or more had the highest mean scores of anger ($p < .05$, Table 2).

The relationship between the purpose of social media use and the loneliness and anger mean scores of adolescents was observed. Adolescents who used Facebook for gaming purposes had the highest loneliness mean scores (52.71 ± 8.88), while those who used Facebook for shopping had the highest anger total and anger sub-dimension scores. The purpose of using Instagram was found not to be related to the total and sub-dimensions of loneliness and anger, except for the anger instrumental sub-dimension in the study. The adolescents who used Instagram for shopping had the highest anger instrumental mean score, and the difference was statistically significant. When the purpose of using Twitter was questioned, the anger total and anger sub-dimensions' scores of the adolescents who used it to "express their opinions" were higher and statistically significant. Adolescents using WhatsApp/Telegram for chatting/messaging purposes had higher loneliness mean scores, and the difference was statistically significant ($p < .05$, Table 3). Adolescents who used WhatsApp/Telegram for video/audio calls had higher anger total and anger sub-dimension mean scores, and the difference was statistically significant ($p < .05$, Table 3).

A structural equation model (SEM) was established and tested to determine the interrelationship (total and indirect effects) of AARS and UCLA. When the fit values in the model were examined (CMIN = 58.255; DF = 5; $p = .000$; CMIN/DF = 11.651; RMSEA = 0.095; GFI = 0.982; CFI = 0.993), the RMSEA and CMIN/DF values were within the required limits for the established model to be valid. Since these values are in the acceptable range, the correction indices were not examined, and the path coefficient/regression weight from AARS to UCLA was found to be statistically significant ($p < .001$) (Fig. 1, Table 4).

Discussion

In recent years, adolescents have become the most active users of social media. The increasing use of social media applications has made it easier for adolescents to communicate and interact with each other. However, it is not clear what kind of effects social media will have on adolescents in the future. This means that 88% of the world's population and the majority of adolescents are neglected (UNICEF, 2014).

Researchers argue that excessive use of social media causes many problems such as tolerance, regression, motivational and functional impairment. At least 12% of those who use social media are social media addicts (Marino et al., 2018). Recent studies state that the inability to control the use of social media is an international public health problem (Kelly et al., 2018).

Social media use is an important factor affecting the mental health of adolescents. Studies demonstrate that social media use has more negative psychological effects on females than males (Effatpanah et al., 2020). Similarly, females spend more time on social media. This situation causes an increase in the use of social media and more psychological problems in females (Kelly et al., 2018). In this study, there was no relationship of social media with loneliness and anger levels in terms of gender.

Rapid physical and psychological changes occur during adolescence. Anger and aggression are observed in adolescents who cannot cope with these changes (Datta & Firdoush, 2012). Many factors are responsible for the development of anger in adolescents. These include restraint, criticism, and underestimation of their abilities. Adolescents may experience anger in these situations (Datta & Firdoush, 2012). Kumar et al. (2016) stated that anger and aggression increase with increasing age/class (Kumar et al., 2016). In this study, seniors had higher

Table 1
The relationship of socio-demographical characteristics with loneliness and anger.

		UCLA Loneliness Scale		Reactive anger		Instrumental anger		Anger control		Anger total	
	%	*Mean ± SD*	Test (*P*)	*Mean ± SD*	Test (*P*)	*Mean ± SD*	Test (*P*)	*Mean ± SD*	Test (*P*)	*Mean ± SD*	Test (*P*)
Gender[a]											
Female ($n = 687$)	58.4	51.61 ± 7.57	0.455 (0.649)	41.71 ± 6.91	0.469 (0.639)	16.95 ± 3.23	0.966 (0.334)	25.92 ± 4.34	1.74 (0.862)	84.59 ± 14.08	0.50 (0.615)
Male ($n = 489$)	41.6	51.82 ± 8.14		41.91 ± 8.09		17.15 ± 3.66		25.96 ± 5.06		85.04 ± 16.49	
Family type[c]											
Nuclear family ($n = 1022$)	86.9	51.59 ± 7.80	3.63 (0.186)	42.01 ± 7.30	7.74 (0.021)	17.13 ± 3.35	6.76 (0.034)	26.07 ± 4.61	7.00 (0.030)	85.22 ± 14.89	3.50 (0.030)
Extended family ($n = 118$)	10.0	52.03 ± 7.92		40.45 ± 8.63		16.51 ± 3.98		25.11 ± 5.22		82.09 ± 17.49	
Broken family ($n = 36$)	3.1	53.63 ± 7.57		39.88 ± 5.95		16.16 ± 3.01		24.83 ± 3.33		80.88 ± 11.87	
Grade[b]											
High school 1 ($n = 208$)	17.7	51.05 ± 7.11	1.14 (0.332)	41.18 ± 6.48	4.07 (0.007)	16.65 ± 3.05	4.55 (0.004)	25.65 ± 3.93	3.60 (0.013)	83.49 ± 13.11	4.05 (0.007)
High school 2 ($n = 381$)	32.4	52.14 ± 8.26		41.20 ± 7.35		16.71 ± 3.32		25.69 ± 4.71		83.61 ± 14.99	
High school 3 ($n = 328$)	27.9	51.89 ± 7.61		41.82 ± 7.22		17.22 ± 3.45		25.75 ± 4.37		84.79 ± 14.65	
High school 4 ($n = 259$)	22.0	51.33 ± 7.91		43.12 ± 8.32		17.58 ± 3.72		26.77 ± 5.33		87.49 ± 17.03	
Academic success (out of 10)[b]											
1–3 (n = 58)	4.9	52.29 ± 9.78	0.86 (0.651)	40.86 ± 8.41	0.81 (0.441)	16.48 ± 3.67	0.82 (0.437)	25.70 ± 5.63	0.70 (0.492)	83.05 ± 17.24	0.71 (0.490)
4–6 ($n = 466$)	39.6	51.49 ± 7.24		41.63 ± 7.03		17.04 ± 3.29		25.76 ± 4.36		84.44 ± 14.29	
7–10 ($n = 652$)	55.4	51.79 ± 8.01		42.00 ± 7.61		17.08 ± 3.48		26.08 ± 4.76		85.17 ± 15.51	
Chronic disease status[c]											
None ($n = 1083$)	92.1	51.78 ± 7.87	4.82 (0.566)	41.69 ± 7.38	13.6 (0.034)	16.97 ± 3.40	16.19 (0.013)	25.88 ± 4.61	11.35 (0.078)	84.55 ± 15.02	14.05 (0.029)
Respiratory Disease ($n = 28$)	2.4	51.46 ± 9.13		41.07 ± 8.78		16.75 ± 3.91		25.42 ± 5.39		83.25 ± 17.75	
Diabetes ($n = 15$)	1.3	50.93 ± 5.52		47.06 ± 8.94		19.80 ± 3.58		28.73 ± 6.11		95.60 ± 18.34	
Epilepsy ($n = 14$)	1.2	48.71 ± 4.56		45.42 ± 4.98		18.78 ± 2.91		28.28 ± 3.56		92.50 ± 10.70	
Heart disorder ($n = 17$)	1.4	51.00 ± 8.57		39.88 ± 5.58		16.35 ± 1.99		24.58 ± 3.95		80.82 ± 11.29	
Chronic renal failure (n = 5)	0.4	48.40 ± 5.89		41.20 ± 5.58		17.40 ± 3.04		24.80 ± 2.77		83.40 ± 11.17	
Migraine-Sinusitis (n = 14)	1.2	51.78 ± 4.66		44.71 ± 8.43		18.21 ± 3.68		27.85 ± 5.68		90.78 ± 17.38	
Duration of sleep[b]											
2–5 ($n = 67$)	5.7	50.74 ± 7.13	0.97 (0.376)	43.37 ± 7.84	2.05 (0.128)	17.80 ± 3.58	2.14 (0.118)	26.86 ± 4.99	2.23 (0.107)	88.04 ± 16.04	2.22 (0.109)
6–9 ($n = 1015$)	86.3	51.69 ± 7.77		41.63 ± 7.28		16.96 ± 3.37		25.83 ± 4.53		84.43 ± 14.80	
10 and above ($n = 94$)	8.0	52.48 ± 8.67		42.40 ± 8.55		17.27 ± 3.74		26.47 ± 5.59		86.15 ± 17.58	
Age	Mean	SD	Max-Min								
	15.56	1.25	13–18								

[a] t-test.
[b] One-way ANOVA.
[c] Kruskal Wallis test.

Table 2
The relationship of social media use with loneliness and anger scores.

	UCLA Loneliness Scale		Reactive anger		Instrumental anger		Anger control		Anger total	
	Mean ± SD	Test (*P*)	*Mean ± SD*	Test (*P*)	*Mean ± SD*	Test (*P*)	*Mean ± SD*	Test (*P*)	*Mean ± SD*	Test (*P*)
Do you use Facebook?[a]										
Yes ($n = 190$)	51.69 ± 8.15	0.016 (0.987)	43.63 ± 8.35	3.73 (0.042)	18.00 ± 3.61	4.25 (0.000)	27.00 ± 5.52	3.43 (0.001)	88.63 ± 17.13	3.85 (0.000)
No ($n = 986$)	51.70 ± 7.75		41.44 ± 7.18		16.85 ± 3.35		25.73 ± 4.44		84.03 ± 14.60	
Duration of Facebook usage[c]										
I never use ($n = 1100$)	51.74 ± 7.70		41.63 ± 7.38		16.96 ± 3.42		25.83 ± 4.58		84.43 ± 15.01	
1–2 h (n = 65)	51.16 ± 8.97	0.07 (0.965)	43.96 ± 7.39	6.81 (0.033)	18.16 ± 3.08	8.87 (0.012)	27.06 ± 5.12	6.56 (0.038)	89.20 ± 15.16	0.91 (0.012)
3 h or more (n = 11)	50.63 ± 11.35		45.09 ± 9.89		17.81 ± 4.37		29.63 ± 6.72		92.54 ± 20.61	
Do you use Instagram?[a]										
Yes ($n = 865$)	51.48 ± 7.57	1.59 (0.111)	41.88 ± 7.53	0.65 (0.516)	17.07 ± 3.42	0.64 (0.522)	26.00 ± 4.76	0.72 (0.471)	84.95 ± 15.34	0.68 (0.493)
No ($n = 311$)	52.30 ± 8.44		41.56 ± 7.14		16.93 ± 3.40		25.77 ± 4.35		84.27 ± 14.50	
Duration of Instagram usage[b]										
I never use ($n = 321$)	52.33 ± 8.39		41.66 ± 7.22		16.95 ± 3.42		25.86 ± 4.42		84.48 ± 14.67	
1–2 h ($n = 263$)	52.20 ± 8.25	3.20 (0.041)	42.44 ± 7.50	1.28 (0.278)	17.33 ± 3.38	1.29 (0.274)	26.26 ± 4.76	0.80 (0.445)	86.04 ± 15.27	1.18 (0.305)
3 h or more ($n = 592$)	51.13 ± 7.23		41.58 ± 7.50		16.95 ± 3.43		25.83 ± 4.73		84.37 ± 15.29	
Do you use Twitter?[a]										
Yes ($n = 369$)	50.64 ± 7.25	3.15 (0.002)	42.69 ± 7.41	2.80 (0.005)	17.40 ± 3.47	2.47 (0.013)	26.48 ± 4.63	2.71 (0.007)	86.58 ± 15.13	2.77 (0.006)
No ($n = 807$)	52.18 ± 8.01		41.38 ± 7.40		16.87 ± 3.38		25.69 ± 4.65		83.95 ± 15.06	
Duration of Twitter usage[b]										
I never use ($n = 924$)	51.88 ± 7.84		41.22 ± 7.32		16.76 ± 3.33		25.62 ± 4.59		83.61 ± 14.87	
1–2 h ($n = 201$)	51.03 ± 7.86	1.18 (0.306)	43.32 ± 7.31	15.79 (0.000)	17.73 ± 3.48	18.27 (0.000)	26.86 ± 4.62	11.65 (0.000)	87.91 ± 15.00	15.72 (0.000)
3 h or more ($n = 51$)	51.00 ± 6.94		46.07 ± 7.70		19.25 ± 3.54		28.07 ± 4.96		93.41 ± 15.85	
Do you use TikTok?[a]										
Yes ($n = 347$)	51.38 ± 7.92	0.91 (0.360)	42.53 ± 7.29	2.19 (0.029)	17.54 ± 3.38	3.27 (0.001)	26.21 ± 4.60	1.29 (0.195)	86.28 ± 14.87	2.21 (0.027)
No ($n = 829$)	51.83 ± 7.77		41.49 ± 7.46		16.82 ± 3.41		25.82 ± 4.67		84.14 ± 15.19	
Duration of TikTok usage[b]										
I never use ($n = 849$)	51.66 ± 7.78		41.71 ± 7.59		16.97 ± 3.45		25.94 ± 4.80		84.63 ± 15.48	
1–2 h (177)	51.62 ± 7.25	0.14 (0.862)	42.06 ± 6.90	0.19 (0.819)	17.27 ± 3.27	0.629 (0.533)	25.89 ± 4.18	0.009 (0.991)	85.24 ± 14.00	0.14 (0.868)
3 h or more (150)	50.02 ± 8.63		41.94 ± 7.09		17.12 ± 3.42		25.96 ± 4.33		85.03 ± 14.42	
Do you use WhatsApp/Telegram[a]										
Yes ($n = 1084$)	51.52 ± 7.47	2.66 (0.008)	41.75 ± 7.05	0.68 (0.496)	17.02 ± 3.28	0.39 (0.694)	25.89 ± 4.39	1.22 (0.222)	84.67 ± 14.34	0.80 (0.424)
No (n = 92)	53.78 ± 10.93		42.30 ± 10.96		17.17 ± 4.73		26.51 ± 7.03		85.98 ± 22.47	
Duration of WhatsApp/Telegram usage[b]										
I never use ($n = 97$)	53.71 ± 10.75		41.95 ± 10.75		17.06 ± 4.63		26.23 ± 6.84		85.25 ± 21.99	
1–2 h ($n = 574$)	51.50 ± 7.56	3.50 (0.030)	41.15 ± 6.36	4.40 (0.012)	16.67 ± 2.94	6.90 (0.001)	25.60 ± 3.98	2.94 (0.053)	83.43 ± 12.88	4.59 (0.010)
3 h or more ($n = 505$)	51.54 ± 7.38		42.49 ± 7.72		17.44 ± 3.60		26.26 ± 4.83		86.20 ± 15.76	

[a] t-test.
[b] One-way ANOVA.
[c] Kruskal Wallis test.

Table 3
The Relationship of Adolescents' Social Media Use Purposes with Loneliness and Anger.

	UCLA Loneliness Scale		Reactive anger		Instrumental anger		Anger control		Anger total	
	Mean ± *SD*	Test (*P*)	*Mean* ± *SD*	Test (*P*)	*Mean* ± *SD*	Test (*P*)	*Mean* ± *SD*	Test (*P*)	*Mean* ± *SD*	Test (*P*)
For what purpose do you use Facebook?[a]										
I do not use ($n = 179$)	49.84 ± 6.87		43.31 ± 7.62		43.31 ± 7.62		26.81 ± 4.71		87.87 ± 15.52	
Shopping ($n = 58$)	50.58 ± 7.62		43.79 ± 9.59		43.79 ± 9.59		27.20 ± 6.29		88.93 ± 19.83	
Keeping in touch with my friends ($n = 87$)	50.60 ± 6.57		41.49 ± 5.17		41.49 ± 5.17		25.87 ± 3.21		84.04 ± 10.44	
Following other people's posts/stories ($n = 395$)	52.56 ± 7.76	2.87 (0.006)	40.56 ± 6.68	3.84 (0.000)	40.56 ± 6.66	4.05 (0.000)	25.23 ± 4.17	3.41 (0.001)	82.27 ± 13.53	3.91 (0.000)
Sharing posts and stories ($n = 206$)	52.04 ± 7.38		41.46 ± 6.68		41.46 ± 6.68		25.63 ± 3.99		84.03 ± 13.49	
Messaging ($n = 140$)	51.55 ± 9.19		42.88 ± 9.03		42.88 ± 9.03		26.47 ± 5.64		86.97 ± 18.38	
Playing games ($n = 95$)	52.71 ± 8.88		42.27 ± 8.42		42.27 ± 8.42		26.45 ± 5.66		85.94 ± 17.35	
Earning money ($n = 16$)	51.93 ± 8.29		41.50 ± 7.28		41.50 ± 7.28		25.62 ± 4.41		84.18 ± 14.79	
For what purpose do you use Instagram?[a]										
I do not use ($n = 352$)	51.94 ± 8.62		41.56 ± 7.17		16.92 ± 3.38		25.79 ± 4.39		84.28 ± 14.56	
Shopping (n = 51)	50.64 ± 7.73		43.72 ± 8.66		18.03 ± 3.90		27.03 ± 5.53		88.80 ± 17.73	
Keeping in touch with my friends ($n = 294$)	50.73 ± 6.29	1.81 (0.108)	42.07 ± 6.86	1.75 (0.120)	17.14 ± 3.14	2.25 (0.047)	26.10 ± 4.42	1.11 (0.349)	85.32 ± 14.04	1.71 (0.128)
Following other people's posts/stories ($n = 269$)	52.49 ± 7.99		41.00 ± 7.34		16.63 ± 3.38		25.58 ± 4.67		83.23 ± 14.99	
Sharing posts and stories ($n = 144$)	51.66 ± 7.83		42.13 ± 8.04		17.19 ± 3.69		26.07 ± 4.92		85.40 ± 16.32	
Messaging ($n = 66$)	52.37 ± 8.41		42.78 ± 8.78		17.66 ± 3.74		26.28 ± 5.54		86.74 ± 17.83	
For what purpose do you use Twitter?[a]										
I do not use (n = 807)	52.18 ± 8.01		41.38 ± 7.40		16.87 ± 3.38		25.69 ± 4.65		83.95 ± 15.06	
Expressing my opinions ($n = 49$)	50.83 ± 7.77		43.34 ± 8.70		18.00 ± 3.92		26.55 ± 5.44		87.89 ± 17.69	
Following popular people ($n = 44$)	50.27 ± 6.62	3.35(0.018)	42.00 ± 5.01	2.87 (0.035)	16.90 ± 2.40	2.85 (0.036)	26.38 ± 3.47	2.46 (0.061)	85.29 ± 10.52	2.79 (0.039)
Following news ($n = 276$)	50.67 ± 7.28		42.68 ± 7.50		17.37 ± 3.53		26.48 ± 4.65		86.55 ± 15.30	
For what purpose do you use TikTok?[b,c]										
I do not use ($n = 671$)	51.52 ± 7.41		41.74 ± 7.19		16.97 ± 3.33		25.95 ± 4.52		84.67 ± 14.67	
Sharing Videos ($n = 61$)	51.57 ± 8.04		41.60 ± 6.04		16.95 ± 2.95		25.75 ± 3.53		84.31 ± 12.11	
Following/Watching Videos ($n = 422$)	52.05 ± 8.36	1.69 (0.429)	41.98 ± 8.00	0.46 (0.791)	17.18 ± 3.61	0.14 (0.928)	26.00 ± 5.02	1.68 (0.431)	85.17 ± 16.29	0.48 (0.786)
Earning money ($n = 22$)	50.68 ± 8.48		40.27 ± 6.56		16.68 ± 3.63		24.72 ± 4.02		81.68 ± 13.36	
For what purpose do you use WhatsApp/Telegram[a]										
I do not use (n = 84)	51.73 ± 7.75		42.47 ± 8.24		17.28 ± 3.58		26.53 ± 5.43		86.29 ± 16.91	
Chat/messaging ($n = 768$)	52.33 ± 8.09		41.25 ± 7.25		16.82 ± 3.35		25.58 ± 4.50		83.65 ± 14.73	
Group conversations (n = 36)	51.69 ± 6.51	4.78 (0.001)	41.33 ± 5.85	4.09 (0.003)	16.80 ± 3.02	3.85 (0.004)	25.55 ± 3.27	4.1 (0.003)	83.69 ± 11.73	4.19 (0.002)
Share/follow stories ($n = 53$)	49.77 ± 6.44		41.73 ± 4.65		16.67 ± 2.21		26.16 ± 3.15		84.58 ± 9.48	
Video/audio call ($n = 235$)	50.04 ± 7.08		43.42 ± 8.16		17.77 ± 3.74		26.90 ± 5.15		88.10 ± 16.70	

[a] t-test.
[b] One-way ANOVA.
[c] Kruskal Wallis test.

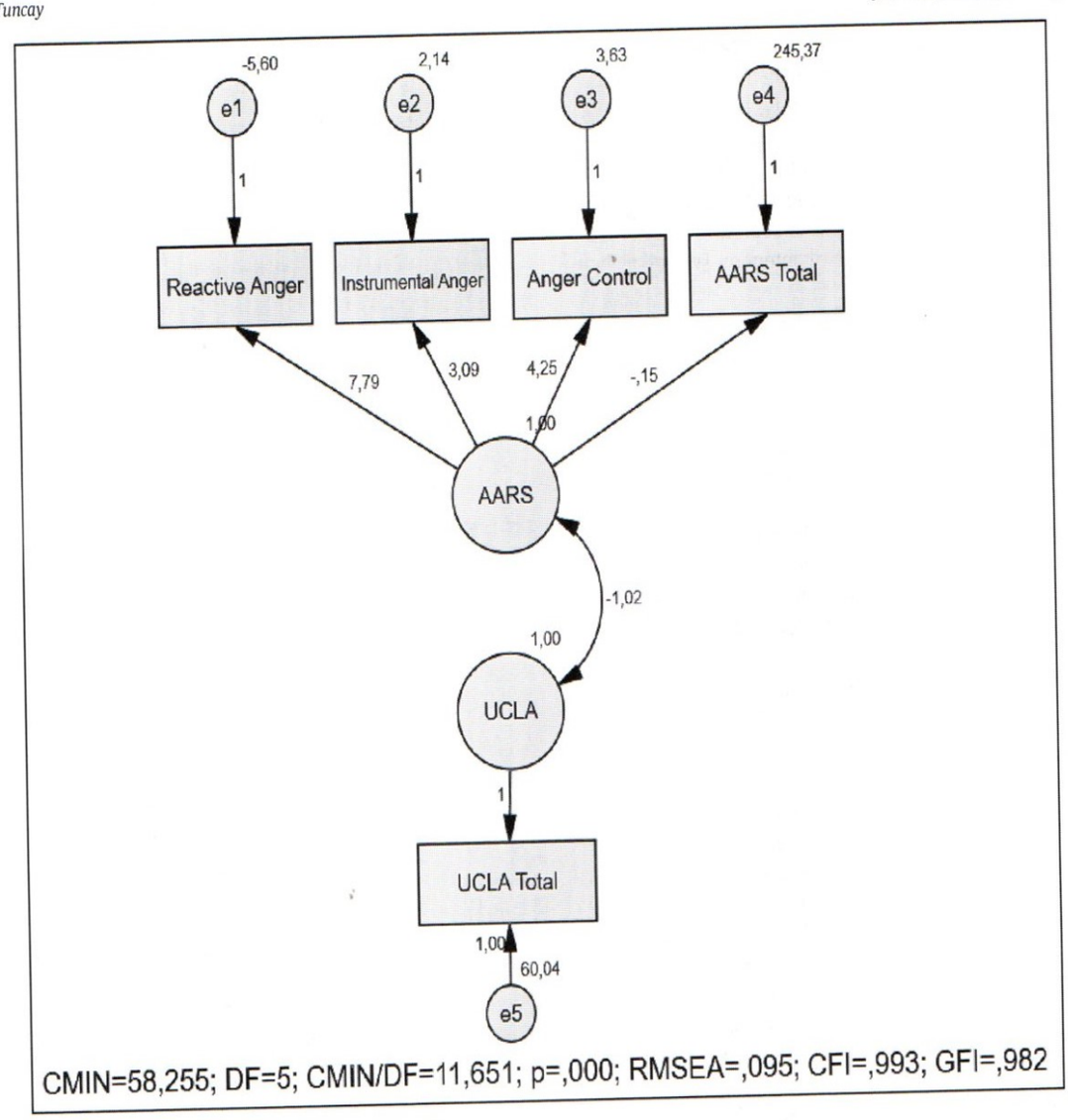

Fig. 1. Standardized path coefficients.
Abbreviations; AARS: The Adolescent Anger Rating Scale; UCLA: UCLA Loneliness Scale; CMIN: Chi-square fit statistics; DF: Degree of freedom; RMSEA: Root mean square error of approximation; CFI: Comparative fit index; GFI: Goodness of fit index.

anger scores. Increasing exam stress in senior years may cause anger scores to rise. The findings were found to be compatible with the literature. Chronic diseases can cause negative emotions such as anger due to their long duration (Kakleas et al., 2009). Kakleas et al. (2009) stated that adolescents with Type 1 diabetes have psychosocial problems such as anger (Kakleas et al., 2009). In this study, adolescents with chronic diseases such as diabetes had higher anger scores.

In this study, Facebook, which has a large user base in social media, has not been found to be associated with loneliness. Lou et al. (2012) found that there was no relationship between Facebook use and loneliness (Lou et al., 2012). Błachnio et al. (2016) expressed that a high level of loneliness significantly increased the use of Facebook (Błachnio et al., 2016). In this study, anger was high in relation to the duration of use in Facebook users. Tandoc et al. (2015) reported that Facebook use triggers negative emotions and leads to mood disorders (Tandoc et al., 2015).

Instagram, which is frequently used by adolescents in this study was not found to be associated with loneliness. There are different results in the literature on this subject. Arampatzi et al. (2018) suggested that individuals use social media to meet their unmet social needs and social isolation, which can increase the possibility of experiencing loneliness (Arampatzi et al., 2018). Pittman (2015) expressed that people who use image-based social media platforms such as Instagram are happier, more satisfied, and less lonely (Pittman, 2015). Friendship relationships during adolescence are very important for adolescents. It is no longer just their parents, but their friends who understand the adolescent best (Datta & Firdoush, 2012). In this study, adolescents with high Instagram usage duration had low loneliness scores. This is thought to be due to the fact that adolescents spend more time with their friends after using Instagram for a long time. Additionally, Instagram's ability to post images in addition to text-based information sharing can help reduce loneliness.

Loneliness scores were lower in Twitter users regardless of the duration of use. Studies report that Twitter allows people with temporary and permanent feelings of loneliness to express themselves and get support from others (Kivran-Swaine et al., 2014). Chen (2011) reported that the use of text-based social media such as Twitter reduces loneliness by creating a friendly environment among adolescents (Chen,

Table 4
Path analysis with observed variables.

Variables			β^0	β^1	S.E.	Test Values	*P*
RA	←	AARS	1.05	7.794	0.145	53.593	<0.001
IA	←	AARS	0.904	3.091	0.077	40.274	<0.001
AC	←	AARS	0.913	4.247	0.104	40.921	<0.001
AARS Total	←	AARS	−0.009	−0.146	0.242	−0.603	0.547
YEM							
UCLA	↔	AARS	−0.012	−1.021	0.139	−7.368	<0.001

Abbreviations; RA: Reactive anger; IA: Instrumental anger; AC: Anger control; AARS: The Adolescent Anger Rating Scale; UCLA: UCLA Loneliness Scale; β^0: Standard coefficient; β^1: Non-standardized coefficient; S.E.: Standard error.

2011). Adolescents can interact with people they cannot reach in real life thanks to Twitter and they can express themselves and alleviate loneliness by interacting online. In this study, the anger of Twitter users was high. Increasing negative events around the world may have some effects on individuals in society. After such events, the topics shared on Twitter trigger feelings of fear, insecurity and anger. As a result, prejudice and intolerance increase (Lowe et al., 2015). It is thought that adolescents were affected by negative content on Twitter and their anger was high because of that.

Adolescents using WhatsApp/Telegram social media had lower loneliness scores. These two applications facilitate instant sharing of information such as text messaging and photos (Iqbal et al., 2020; Rosenberg & Asterhan, 2018). Pittman and Reich (2016) expressed that social media applications where mutual conversations and visual sharing can be made are associated with low loneliness scores (Pittman & Reich, 2016). Kaakinen et al. (2020) argued that online platforms make it easier for individuals to establish relationships with other people, come together with like-minded people, and form peer support groups and reported that this situation can reduce distress and loneliness (Kaakinen et al., 2020). In this study, duration of using WhatsApp/Telegram was related to anger. Rimé (2009) has stated that there is a temporary relief after the expression of emotions by social media, but the emotional state does not change (Rimé, 2009). These results suggest that anger may be related to the personality structure of adolescents and therefore it is high.

Lonely people express themselves online because they avoid interacting with others (Satici, 2019). Considering this aspect, social media tools have different uses. Facebook, declared as the world's largest social networking site with 1.23 billion daily active users in December 2016, tries to meet these requirements (Cataldo et al., 2022). Donati et al. (2022) reported that bored young people see Facebook as an ideal environment to spend time and relieve their boredom (Donati et al., 2022). In this study, adolescents who use Facebook for games have higher loneliness scores. This is consistent with the results that social media application causes loneliness in excessive use.

In this study, adolescents who use WhatsApp/Telegram for chat had higher loneliness scores. With apps like WhatsApp, it has become easier for its users to like or react to other people's posts with emojis or comments. Updating stories creates various chat environments with other users and speeds up interpersonal communication. This can help chat users have fun or temporarily distract from negative situations (Rosenberg & Asterhan, 2018). Quan-Haase and Young (2010) reported that after using the instant messaging and chat applications that people see more sincerely, their problems are reduced and they receive emotional support through the application (Quan-Haase & Young, 2010). It is thought that adolescents have high loneliness scores because they use text -based applications instead of visual image -based features in WhatsApp/Telegram.

Limitations

The study provides valuable insights into the relationship between multiple social media platforms and loneliness and anger. Previous research has predominantly focused on Facebook and Instagram, which limits the generalizability of their findings. By examining the effects of various social media applications on adolescents and identifying how and why they use these platforms, this study can serve as a useful guide for future research. However, it is important to acknowledge that the study has some limitations. It was conducted in a single province and relied on a cross-sectional survey design. Moreover, the study did not collect detailed information about the personality traits of the participants or the emotions they experienced while using social media. To overcome these limitations, future studies should be replicated in different universities, countries, and age groups to better understand how these findings differ across diverse populations.

In summary, while the study offers significant contributions to the field of social media research, its limitations highlight the need for further investigation into the complex relationships between social media and emotional well-being.

Practice implications

As a healthcare professional in the field of pediatric nursing, it is important to understand the effects of social media on adolescent health and wellbeing. The findings of this study have significant implications for pediatric nursing practice. Pediatric nurses can help is by educating adolescents and their parents on the importance of balanced social media use, as well as the risks of excessive use. Additionally, nurses can work with schools and community-based organizations to provide social skills training and promote positive online interactions. Incorporating mental health services into pediatric nursing practice can also be beneficial. This can involve providing access to mental health professionals who can help adolescents cope with negative emotions such as anger and loneliness, as well as develop healthy coping strategies. Nurses can also work with parents and caregivers to set healthy boundaries around social media use and promote positive social media habits. Overall, pediatric nurses can play an important role in mitigating the negative impact of social media on adolescent health and wellbeing. By implementing the practice implications highlighted by this study, pediatric nurses can help promote a healthier digital environment for adolescents and support their overall emotional wellbeing.

Conclusion

This study has shown that adolescents widely used different social media platforms such as Facebook, Instagram, Twitter, TikTok, WhatsApp/Telegram. Adolescents with chronic disease, senior grade were found to have higher levels of anger. Those who use Instagram for extended periods of time had lower loneliness scores, while those who use Facebook and WhatsApp/Telegram for prolonged periods had higher anger levels. This study has found that those who use Facebook for gaming and those who use WhatsApp/Telegram for chatting had higher loneliness scores, while those who use these applications for shopping had high anger scores.

In summary, our findings highlight the heterogeneous relationship of Facebook, Instagram, Twitter, TikTok, WhatsApp/Telegram with loneliness and anger levels in adolescents. These findings support existing literature regarding the relationship between social media use and loneliness and anger. It's fine for teens to use social media, but it's important to set that aside and hang out with friends face-to-face to socially "reset" and "resolve" inner anger. We think that social media use among adolescents is acceptable, but not a valid substitute for face-to-face human interaction. Although they can freely express their thoughts on social media even in times of anger, learning anger management skills and respectful social behavior is best done face-to-face. Pediatric nurses should be able to guide adolescents about the problems caused by the unconscious use of social media. We also suggest creating support groups where adolescents can communicate face-to-face, and promoting opportunities for adolescents to gather in person in order to minimize the potentially harmful effects of social media.

Ethics approval and consent to participate

Not applicable.

Consent for publication

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CRediT authorship contribution statement

Abdullah Sarman: Conceptualization, Methodology, Investigation, Writing – review & editing, Supervision. **Suat Tuncay:** Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Project administration.

Data availability statement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declaration of Competing Interest

The authors declare that they have no conflict of interest.

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