




# Problematic Social Media Use and Social Connectedness in Adolescence: The Mediating and Moderating Role of Family Life Satisfaction

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Accepted: 7 October 2020/Published online: 18 November 2020

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## Abstract

Problematic social media use (PSMU) among adolescents has become an area of increasing research interest in recent years. It is known that PSMU is negatively associated with social connectedness. The present study examined the role of family life satisfaction in this relationship by investigating its mediating and moderating role in the relationship between problematic social use and social connectedness. The present study comprised 549 adolescents (296 girls and 253 boys) who had used social media for at least 1 year and had at least one social media account. The measures used included the Social Media Disorder Scale, Social Connectedness Scale, and Family Life Satisfaction Scale. Mediation and moderation analyses were performed using Hayes's Process program. Regression analysis showed that PSMU negatively predicted family life satisfaction and social connectedness. In addition, family life satisfaction and PSMU predicted social connectedness. Mediation analysis showed that family life satisfaction had a significant mediation effect in the relationship between PSMU and social connectedness. Family life satisfaction was partially mediated in the relationship between PSMU and social connectedness. Moderation analysis showed that family life satisfaction did not have a significant effect on the relationship between PSMU and social connectedness. The study suggests that family life satisfaction is a meaningful mediator (but not a moderator) in the relationship between problematic social media use and social connectedness.

**Keywords** Problematic social media use · Social networking · Social connectedness · Family life satisfaction · Mediation analysis · Moderation analysis · Adolescence

Over the past 20 years, Internet use has grown in most countries worldwide and has become an important tool in almost every aspect of an individual's day-to-day lives. The Internet can be

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used for many different activities including (among other things) communicating, having fun, learning, gaming, shopping, and gambling (Castellacci and Vinas-Bardolet 2019; Gross 2004; Yavuz 2019). One of the most popular activities on the Internet is social networking, and more generally social media use in all its many forms. Social media applications such as Facebook and Instagram provide the opportunity to meet different people by creating personal profiles, and facilitates the personal communicating, sharing, and expressing of ideas about an event or situation with others in different places globally (Griffiths et al. 2014; Treem et al. 2016). Social networking has increased the prevalence of online use worldwide with the many opportunities and outlets provided to its users. According to a PEW Research Center (2019) social media usage report, 72% of Americans use at least one social media application. According to We Are Social (2019), 45% of the world's population actively uses social media (Kemp 2019). Furthermore, the average daily time spent using social media in the world is 2 h and 16 min (Kemp 2019).

Like problematic Internet use, increasing frequency of social media use can lead to an increase in problematic social media use among a minority of users (Savci et al. 2020). Conceptually, the abuse of social media use has been referred to (among others) as social media addiction (Andreassen et al. 2017), social media disorder (Savci and Aysan 2018), excessive social media use (Griffiths and Szabo 2014), problematic social media use (Meena et al. 2012; Savci et al. 2019), compulsive use of social media (De Cock et al. 2014), and pathological social media use (Holmgren and Coyne 2017). Although these problems are conceptualized with different labels, they point to the same problem. In this paper, the term "problematic social media use" (PSMU) is used.

It has been found that PSMU is positively associated with depression, anxiety, psychological stress, sleep disorders, and cyber victimization (Byrne et al. 2018; Keles et al. 2019; Levenson et al. 2016). Although PSMU is associated with many psychological problems, like Internet addiction, it is not classified as a disorder in the DSM-5 (Savci and Griffiths 2019). For the majority of individuals, social media use is enjoyable and beneficial. The use of social media enables individuals to communicate with friends and family as well as to establish new social relationships (Savci 2019). Also on social media, comments and "likes" from friends, family, or other people can provide social support. Social support positively affects life satisfaction (Zhan et al. 2016). Beyens et al. (2016) emphasize that adolescents use social media to meet the needs of connectedness and popularity. According to Deci and Ryan's (2008) self-determination theory, there are three psychological need satisfactions: autonomy, competence, and relatedness. Autonomy refers to doing something optional. Competence is about the ability to build and maintain social relationships. Relatedness is the establishment of positive emotional relationships with people. Consequently, social media satisfies all three psychological needs of self-determination theory. Finally, families use social media to control and communicate with their children. Consequently, this increases the connectedness of individuals in the family (Doty and Dworkin 2014). Although social media positively affects users, excessive use of social media can cause problematic use.

Social connectedness is one of the important variables for adolescent healthy development (Stoddard et al. 2011). The need to belong is one of the most basic needs of people and is present among all people at different levels and forms (Baumeister and Leary 1995). Maslow's (1954) need to love and belong in the hierarchy of needs is a need that follows physiological and safety needs (Koltko-Rivera 2006). The use of social media enables adolescents to communicate with their peers online and meets the need for adolescents to belong (Davis 2012). On the other hand, when social media is used problematically, it negatively affects

social connectedness (Savci and Aysan 2017). One of the variables associated with PSMU is family life satisfaction (Li et al. 2014; Wu et al. 2016). Family life satisfaction is influenced by variables such as psychological health, positive attitudes of family members, and well-being of family members (Agate et al. 2009). PSMU may reduce communication between family members and weaken the sense of attachment and connectedness between them (Gunuc and Dogan 2013; Park et al. 2008). According to Kuss and Griffiths (2011), using social media to feel belonging to a group is a possible risk factor for PSMU. Therefore, adolescents' feelings as a member of the family and having a high life satisfaction from the family can be a protective factor against PSMU.

## **Problematic Social Media Use and Social Connectedness**

Excessive use of social media can negatively affect the connectedness of adolescents. This may cause adolescents to encounter problems in their social relationships (Cookingham and Ryan 2015). Pitmann and Reich (2016) found that the use of photo-based social media applications (Instagram, Snapchat) had a significant role in increasing loneliness. Yao and Zhong (2014) investigated loneliness, social interaction, and Internet addiction among university students and found a positive relationship was found between Internet addiction and loneliness. They also reported a positive relationship between online social interaction and Internet addiction and a negative relationship between face-to-face social interaction and Internet addiction. Ryan et al. (2017) reviewed the findings of 12 studies examining the relationship between social media use and social connectedness. The review argued that the relationship between social media use and social connectedness was not one-way and unclear. In some of the studies [reviewed by Ryan et al. 2017], it has been found that the use of social media increases social connectedness and in some studies, it is found to cause loneliness.

Social connectedness is the result of individuals feeling meaningful and valuable in their social relationships (Lee and Robbins 1998). Ahn and Shin (2013) stated that social media used for communication (Facebook, Twitter) and videos (YouTube) had a positive relationship with social connectedness, whereas social media used for reading (reports or e-books) had no significant relationship with social connectedness. McIntyre et al. (2015) examined the relationship between problematic Internet use and social connectedness among university students and found a negative relationship between Internet addiction and social connectedness. When the research results are evaluated as a whole, it appears that the use of social media positively affects social connectedness, whereas PSMU appears to negatively affect social connectedness.

## **Problematic Social Media Use and Family Life Satisfaction**

Sharaievska and Stodolska (2016) examined the relationship between social media use and family life satisfaction. Their study found that the use of social media increased communication within the family and that family members made joint plans as a result of using social media. However, it was also found that the social interaction in the family decreased due to the increased time spent on social media. In a large-scale study ( $n = 3662$ ), adolescents with Internet addiction had more discussions with their parents but family life satisfaction was lower (Yen et al. 2007). Similarly, Kabasakal (2015) found that as the problematic Internet use levels of university students increased, their level of life satisfaction decreased. In addition, it

was determined that students with high problematic Internet use had negative family relationships. Roberts and David (2016) examined the relationship between excessive phone use and relationship satisfaction. In their study, it was determined that dealing with the phone reduces the relationship satisfaction. In their study with 459 parents, Baker et al. (2017) found that 45% of the parents used social media, and 65% used parenting-related sites (to learn about parenting). The study stated that the Internet and social media provide information to parents. Williams and Merten (2011) examined the effect of Internet and social media use on family relationships among 386 parents. Parents who participated in the study stated that the Internet and social media increased family intimacy (26.8%), family communication (75.3%), and quality of family communication (54.9%). In addition, it was stated that excessive use of the Internet and social media can reduce the closeness and time spent among family members. McDaniel et al. (2012) found that mothers used the Internet for social media applications ( $n = 157$  mothers). However, the study concluded that the use of social media did not have a significant relationship with the communication between family members.

### Family Life Satisfaction and Social Connectedness

The family is one of the most important building blocks in society and the connectedness of family members to each other contributes to the connectedness of members of the society (Johnson et al. 2008). Although the importance of family for society is known, there are very few studies examining the relationship between family life satisfaction and social connectedness. Family life satisfaction is the satisfaction that individuals receive from the time spent with family members (Carver and Jones 1992). Toth et al. (2002) examined the relationship between family life satisfaction and community satisfaction. In their study, a positive relationship was found between community satisfaction and family life satisfaction. Increasing family life satisfaction increases community satisfaction, and increasing community satisfaction increases family life satisfaction. Therefore, it can be said that there is a mutual relationship between family life satisfaction and community satisfaction. Social connectedness is one of the most basic needs of a human being (James et al. 2017). Calmeiro et al. (2018) investigated the effects of social and individual factors on life satisfaction ( $n = 3494$  adolescents). They concluded that family support is one of the important variables in life satisfaction. This research shows the importance of family support to adolescents' life satisfaction. Youngblade et al. (2007) in their study on 42,305 adolescents concluded that closeness and communication between family members had a positive effect on adolescents' social skills. Wan et al. (1996) reported that the social support provided by spouses to each other increases marital satisfaction and life satisfaction. Increased satisfaction and life satisfaction from marriage may increase the connectedness among family members. Botha and Booysen (2014) examined the relationship between family functioning and life satisfaction and found that family functionality is considered as supporting and protecting each family member. Furthermore, a positive relationship was found between family functioning and life satisfaction.

PSMU is closely related to social connectedness and family life satisfaction. However, there are no studies in the literature examining PSMU, social connectedness, and family life satisfaction together. Therefore, the aim of the present study was to investigate the mediating and moderating roles of family life satisfaction in the relationship between PSMU and social connectedness among adolescents. Adolescence is a period that includes many social, psychological, and academic problems. Adolescents

try various ways to solve these problems. Some adolescents use the Internet and social media as an escape from problems they have difficulty solving (Yen et al. 2008). However, adolescents use social media applications that enable online communication more widely than other age groups (Valkenburg and Peter 2011). The increase in the frequency and time spent by adolescents in the online environment, which replaces activities carried out offline, may cause PSMU among adolescents. In addition, the risk of Internet addiction is higher in adolescents than in other age groups because adolescents have difficulty in controlling their behavior (Ha et al. 2007). Factors such as social connectedness and family life satisfaction in adolescence play a critical role in solving the problems faced by adolescents. In addition, social connectedness and family life satisfaction have protective features during this period (Malaquias et al. 2015). Individuals who establish a healthy relationship with the society in which they live and feel themselves belong to the society are less vulnerable to psychological problems (Bond et al. 2007; Hahm et al. 2012). Support from the family and the feeling of being a part of the family may have a protective effect against psychological problems. On the other hand, having problems with their parents is a risk factor for behavioral problems (e.g., unhappiness, crying, acting shy, social withdrawal, impulsivity, fighting, arguing, hyperactivity) (Williams and Kelly 2005). In addition to family social support, social support from individuals outside the family has a protective effect against the Internet and PSMU (Tsai et al. 2009). In addition, individuals who receive social support from their families and who feel satisfaction from family life have positive feelings and behaviors towards society and feel connected to society (Black and Lobo 2008). According to social control theory, family members who feel that they receive support from their parents and have a close relationship with their parents live in harmony with their parents (Wright and Cullen 2006). Perceived problems and discussions in the family may cause family members to receive support from the Internet or social media. Indeed, according to Chou and Hsiao (2000), one of the most important predictors of Internet addiction is satisfaction from communication with other people on the Internet.

## The Present Study

Based on the aforementioned literature, the present authors propose that the relationship between PSMU and social connectedness should be examined via mediator and moderator variables rather than as a direct relationship. However, previous literature has tended to explain this relationship directly (e.g., Savci and Aysan 2017). The present study examined the role of family life satisfaction in this relationship by investigating the mediating and moderating roles in the relationship between problematic social media use and social connectedness. The following hypotheses ( $H_s$ ) were examined:

- $H_1$ : PSMU negatively predicts social connectedness.
- $H_2$ : PSMU negatively predicts family life satisfaction.
- $H_3$ : Family life satisfaction positively predicts social connectedness.
- $H_4$ : Family life satisfaction has a mediating role in the relationship between PSMU and social connectedness.
- $H_5$ : Family life satisfaction has a moderating role in the relationship between PSMU and social connectedness.

## Methods

### Participants

The present study comprised 549 adolescents (296 girls and 253 boys) who were studying in various schools in Turkey's Agri province. Demographic information of the total sample is presented in Table 1.

### Materials

**Social Media Disorder Scale** The Social Media Disorder Scale (SMDS), which was developed by van den Eijnden et al. (2016) and adapted to Turkish by Savci et al. (2018), is a Likert-type (1 = Never–5 = Always) scale comprising nine items and is unidimensional. The SMDS comprises nine items (e.g., "...often felt bad when you could not use social media?" "...tried to spend less time on social media, but failed?"). High scores indicate high levels of problematic social media use. In the present study, Cronbach's alpha was very good ( $\alpha = 0.91$ ).

**Social Connectedness Scale** The Social Connectedness Scale (SCS) which was developed by Lee and Robbins (1995) and adapted into Turkish by Duru (2007) is a one-dimensional instrument comprising eight negative items (e.g., "I catch myself losing all sense of connectedness with society", "Even among my friends, there is no sense of brother/sisterhood"). The SCS is assessed on a 6-point scale (1 = Absolutely I agree to 6 = I strongly disagree). There are no reverse-scored items, and high scores indicate high level of social connectedness (Duru 2007). In the present study, Cronbach's alpha was 0.83.

**Table 1** Demographic information of the sample ( $N = 549$ )

Variable	Statistics
Sex	Girls = 296 (53.9%) Boys = 253 (46.1%)
Age	14–18 age range; mean age = 15.60, SD = 1.27
Grade level	9th grade = 235 (42.8%) 10th grade = 216 (39.3%) 11th grade = 89 (16.2%) 12th grade = 9 (1.6%)
Number of social media accounts	1–14 shares; mean = 5.37
Daily social media using duration	Less than an hour = 145 (6.4%) 1–3 h = 190 (34.6%) 4–6 h = 139 (25.3%) 7 h or more = 75 (13.7%)
Perceived socio-economic level	Very low = 26 (4.7%) Low = 50 (9.1%) Middle = 420 (76.5) High = 44 (8.0%) Very high = 9 (1.6%)
Number of siblings	1–14 siblings; mean = 3.52
Family type	Nuclear family = 380 (69.2%) Extended family = 169 (30.8%)
Total	549

**Family Life Satisfaction Scale** The Family Life Satisfaction Scale (FLSS), which was developed by Barraca et al. (2000) and adapted to Turkish by Tasdelen-Karckay (2016), comprises 27 items (“When I am at home, with my family, I mostly feel...”; endpoints range from happy to unhappy) and is unidimensional. FLSS is assessed by a 6-point rating. High scores indicate a high-level family life satisfaction (Tasdelen-Karckay 2016). In the present study, Cronbach’s alpha was 0.79.

## Procedure and Ethics

In the present study, approval was granted by the first author’s university ethics committee. Each phase of the study was carried out in accordance with the Declaration of Helsinki. The surveys were administered to adolescents in grades 9 to 12 (i.e., a total of 29 classes from six different schools). The schools chosen were those most easily accessible to the research team and therefore, the participants comprised a convenience sample. The aim of the study was explained to the participants, and written informed consent was provided by all participants. The data were collected voluntarily in the classes where the students were educated. Volunteer students using social media for the last year were included in the study. Using social media for the past year was the sole inclusion criterion. Students who did not use social media and did not want to participate in the study were excluded. The data collection process for each participant lasted approximately 20–25 min.

## Data Analysis

In the present study, the mediating and moderating roles of family life satisfaction in the relationship between PSMU and social connectedness were examined. Prior to the analysis, preconditions for mediating and moderating analyses were examined. Accordingly, the data should provide single and multiple normalities. In addition, there should be no multicollinearity problem in the dataset. Firstly, by considering the skewness and kurtosis coefficients, the dataset was examined for univariate normality. The skewness and kurtosis coefficients for the variables were between  $\pm 1.5$ . Therefore, the data had univariate normality. The dataset was then analyzed for multivariate normality. For this purpose, a Scatter Diagram Matrix was examined. As a result of the analysis, elliptical distribution was observed. These results indicated that the dataset met the assumptions of multivariate normality. The multicollinearity problem occurs when the binary correlations between the variables are greater than 0.90 (Cokluk et al. 2012). All binary correlation coefficients of the variables were smaller than 0.90. Therefore, there was no multicollinearity problem in the data set. Mediation and moderating analyses were performed using Hayes’s (2017) process application. Mediation and moderation analyses were performed using the Process program. Process is a program that works as an add-on to SPSS. Process can analyze complex moderators and mediator models.

## Results

Bivariate correlations (Table 2) show that all the variables were moderately related to each other. The mediating effect of family life satisfaction was tested in the relationship between PSMU and social connectedness. Analyses concerning the mediation and moderation effect of family life satisfaction are presented below.

**Table 2** Descriptive statistics and bivariate correlations among variables

	1	2	3
1. Problematic social media use	-		
2. Social connectedness	-.40**	-	
3. Family life satisfaction	-.45**	.44**	-
Range	36	40	108
Mean	18.51	28.11	76.92
SD	9.42	11.57	15.66
Skewness	1.03	-.052	.170
Kurtosis	.274	-.788	1.441

\*\* $p < .01$ 

## Mediation Analysis

Table 3 presents the results for three different models. The first stage comprises results concerning the regression between PSMU and family life satisfaction. According to the first model, the PSMU predicted family life satisfaction significantly and negatively ( $F = 136.63$ ,  $R^2 = .20$ ,  $p < .001$ ). PSMU explained 20% of the variance in family life satisfaction. The second stage comprised the regression between PSMU and social connectedness. Here, PSMU predicted social connectedness significantly and negatively ( $F = 104.10$ ,  $R^2 = .16$ ,  $p < .001$ ). PSMU explained 16% of the variance in social connectedness. The third stage comprised the regression among family life satisfaction, PSMU, and social connectedness. Here, family life satisfaction and PSMU predicted social connectedness ( $F = 89.99$ ,  $R^2 = .25$ ,  $p < .001$ ). Family life satisfaction and PSMU explained 25% of the variance in social connectedness. Family life satisfaction positively predicted social connectedness. However, PSMU predicted social connectedness in a negative way.

In the third model, the model coefficient between the PSMU and social connectedness was  $-0.49$ . However, when family life satisfaction was included in the model with PSMU in the third model, the coefficient related to PSMU was  $-0.31$ . This coefficient was also statistically

**Table 3** The findings related to the mediating role of family life satisfaction

Outcome: family life satisfaction							
Model summary	<i>R</i>	<i>R</i> <sup>2</sup>	MSE	<i>F</i>	df1	df2	<i>p</i>
	.45	.20	196.62	136.63	1	547	<.001
Model 1	Coefficient		SE	<i>t</i>	<i>p</i>	95% CI	
	Problematic social media use		0.07	-11.69	<.001	Lower	Upper
						-0.87	-0.62
Outcome: social connectedness							
Model summary	<i>R</i>	<i>R</i> <sup>2</sup>	MSE	<i>F</i>	df1	df2	<i>p</i>
	.40	.16	112.65	104.10	1	547	<.001
Model 2	Coefficient		SE	<i>t</i>	<i>p</i>	95% CI	
	Problematic social media use		0.05	-10.20	<.001	Lower	Upper
						-0.59	-0.40
Outcome: social connectedness							
Model summary	<i>R</i>	<i>R</i> <sup>2</sup>	MSE	<i>F</i>	df1	df2	<i>p</i>
	.50	.25	101.03	89.99	2	546	<.001
Model 3	Coefficient		SE	<i>t</i>	<i>p</i>	95% CI	
	Family life satisfaction		0.03	7.99	<.001	Lower	Upper
	PSMU		0.05	-6.06	<.001	-0.41	-0.21



significant. Therefore, these results demonstrate that family life satisfaction is partially mediated in the relationship between PSMU and social connectedness (indirect effect coefficient =  $-0.18$ ). Whether the indirect effect was significant was investigated by bootstrapping and the Sobel test. The analysis showed that the mediation effect was significant, and within the expected confidence interval (CI =  $-0.24, -0.13$ ). In addition, the Sobel test results were also statistically significant (Sobel  $Z = -6.58, p < .001$ ). Consequently, these results demonstrate that family life satisfaction is partially mediated in the relationship between PSMU and social connectedness.

## Moderation Analysis

Table 4 shows that the moderator model was significant ( $F = 60.76, R^2 = .25, p < .001$ ). In this model, family life satisfaction, PSMU, and interaction (family life satisfaction  $\times$  PSMU) were used as predictive variables. When the contributions of predictive variables to the model were examined, family life satisfaction (CI =  $0.18, 0.30$ ) and PSMU (CI =  $-0.39, -0.17$ ) made a significant contribution to the model. However, the interaction did not contribute statistically to the model (CI =  $-0.001, 0.008$ ). This indicates that the moderating effect of family life satisfaction was not significant. The  $R^2$  increase associated with the addition of the interaction term was not significant ( $R^2$  change =  $.003, p > .05$ ).

## Discussion

In the present study, the mediating and moderating roles of family life satisfaction were investigated in the relationship between PSMU and social *connectedness*. The results showed that  $H_1, H_2, H_3,$  and  $H_4$  were supported but  $H_5$  was not. Consistent with first hypothesis ( $H_1$ ), as expected, the use of problematic social media directly and negatively predicted social connectedness. Among a small minority, the use of the Internet can lead to future addiction, which may prevent such individuals from building healthy social relationships (Wolfrad and Doll 2001). Sanchez-Franco et al. (2012) investigated how social media affects individuals' social connectedness to society. They found that using social media applications increases the participation and connectedness of the users to the society. Similarly, Xie et al. (2017) found a positive relationship between the positive attitudes of the users of WeChat application and their social and cultural connectedness. Best et al. (2014) examined 43 studies examining the effects of online communication and social media use on adolescents' well-being. They concluded that online communication and social media use increased perceived social support and social

**Table 4** The findings related to the moderating role of family life satisfaction

Outcome: social connectedness							
Model summary	<i>R</i>	<i>R</i> <sup>2</sup>	MSE	<i>F</i>	df1	df2	<i>p</i>
Model	.50	.25	100.85	60.76	3	545	<.001
	Coefficient		SE	<i>t</i>	<i>p</i>	95% CI	
Family life satisfaction	0.24		0.03	7.98	< .001	0.18	0.30
Problematic social media use (PSMU)	-0.28		0.05	-5.15	< .001	-0.39	-0.17
Family life satisfaction $\times$ PSMU	-0.003		0.002	1.41	> .05	-0.001	0.008

relationships. On the other hand, Hu (2009) stated that the participants ( $n = 234$ ) in his study felt lonely after online chatting. In addition, he concluded that the participants felt higher levels of loneliness after online communication compared to natural communication in social environment. Contrary to Hu's (2009) findings, Barker (2009) found that people who were afraid of face-to-face interaction and isolated from the society used social media to make friends and communicate. Valkenburg et al. (2006), in their study of 881 adolescents, stated that 35% of adolescents established friendship relationships through social media applications. Finally, it should be noted that studies examining the relationship between social media use and social connectedness and/or loneliness do not show consistent results. It is recommended that parents within families control the use of social media by considering the impact of PSMU on adolescents' social relationships. In addition, both parents and other members of the family may be advised to discuss the duration of social media use and the effects of social media. It is recommended that researchers focus on studying individual characteristics that may reduce the negative impact of PSMU on users' social connectedness.

Consistent with  $H_2$ , PSMU directly and negatively predicted family life satisfaction. Regarding  $H_2$  on PSMU and family life satisfaction, higher levels of PSMU predicted lower family life satisfaction. Both similar and different results have been obtained in previous studies examining the effect of social media use and PSMU on family life. Padilla-Walker et al. (2012) studied the relationship between 453 adolescents and their use of social media and family ties. They reported a negative relationship between the use of social media and family ties. Mesch (2003) examined the relationship between Internet use and familial characteristics and concluded that the increase in the frequency of Internet use decreased the quality of family relationships among adolescents. On the other hand, O'Keeffe and Clarke-Pearson (2011) emphasized that social media enabled adolescents to stay in contact with their families. Today, although social media is still used by most adolescents, it is becoming more prevalent in other age groups. Therefore, researchers should examine and compare the effects of PSMU levels on family life satisfaction of parents and children separately. Finally, it should be noted that we do not claim that social media is harmful. Social media use can contribute to family life satisfaction when used effectively. On the other hand, PSMU negatively affects family life satisfaction.

Concerning the hypothesis on family life satisfaction and social connectedness ( $H_3$ ), family life satisfaction predicted social connectedness. As the life satisfaction of family members can affect their daily life, variables in daily life can also affect the life satisfaction of family members (Zabriskie and McCormick 2003). Malaquias et al. (2015) studied how adolescents and their family members spend time with each other. In the study, a positive relationship was found between the time spent together by family members and their social connectedness. This shows that as the time spent with members of the family increases, the social connectedness of family members also increases. Gilman (2001), in his study of 321 adolescents, concluded that adolescents with high social interest had high family life satisfaction. In this study, social interest was used as a term that requires social thinking rather than individuality, including the feeling of belonging. Family is part of society, and positive and negative variables within the family also affect the social life of family members. As far as the authors know, there is no study showing that the relationship between family life satisfaction and social connectedness is negative. Therefore, the general tendency in the literature shows that the relationship between family life satisfaction and social connectedness is positive. This consensus in the literature is consistent with our results.

Finally, we found support for a mediation hypothesis ( $H_4$ ) but not for a moderation hypothesis ( $H_5$ ). PSMU predicted social connectedness via family life satisfaction. However, family life satisfaction did not moderate the relationship between PSMU and social connectedness. These results show that  $H_4$  was supported, but  $H_5$  was not. As far as the authors are aware, there is no previous study that has examined the mediating and/or moderating role of family life satisfaction in the relationship between PSMU and social connectedness. Therefore, the result of the mediating and moderating analysis is an indirect rather than a direct one. Previous research has indicated that PSMU decreases family life satisfaction (Kabasakal 2015; Yen et al. 2007) and low family life satisfaction weakens social connectedness (Toth et al. 2002; Youngblade et al. 2007). In addition, PSMU can directly cause a decrease in social connectedness (McIntyre et al. 2015; Pitmann and Reich 2016; Yao and Zhong 2014). Consequently, in a small study of adolescents ( $n = 224$ ), Foster et al. (2017) concluded that family connectedness protects adolescents against various psychological problems. Therefore, family life satisfaction appears to strengthen social connectedness and reduce PSMU. Families should engage in activities that increase communication, joint actions, and engagement within the family. Mental, psychological, emotional, and personality traits of the social media users are also important determinants in the development of PSMU. Therefore, it is recommended that researchers also examine individual variables that may be related to PSMU.

### Strengths, Limitations, and Future Research

Researchers emphasize that social connectedness is a developmental concept (Lee and Robbins 1995, 1998). Therefore, the results of this study should be taken into consideration in future studies to help develop social connectedness among adolescents. The direct relationship between PSMU and social connectedness has been highlighted in previous literature. However, mediator and moderator effects have been ignored. Therefore, the results of the present study show how PSMU can be a risk factor for social connectedness.

There are a number of limitations that need to be taken into account when interpreting the results of the study. The study utilized a self-selecting convenience sampling method (from schools in one Turkish city), and therefore, the findings are not necessarily generalizable to other cities in and outside of Turkey. The study should therefore be replicated in different cultures (e.g., Middle East, USA, Europe). This would show whether the results obtained in the present study are valid among adolescents from different cultures. Studies with larger and more representative samples are needed to confirm the findings reported here. The measurement tools were all based on self-report which is subject to well-known methodological biases, and the survey tool was cross sectional. Therefore, other methods including longitudinal studies (to get a better idea about causation rather than association) and qualitative studies (to gather more in-depth data) are needed to expand on the findings here.

### Conclusion

The present study demonstrated that the relationship between PSMU and social connectedness can be explained via family life satisfaction. However, family life satisfaction was not a significant moderator in this relationship. Therefore, the first four hypotheses ( $H_1$ – $H_4$ ) were confirmed. The findings show that the relationship between PSMU and social media can be explained via family life satisfaction. However, when family life satisfaction is combined with

PSMU, it does not better explain social connectedness. Therefore, both problematic social media use and family life satisfaction should be taken into consideration in studies related to increasing social connectedness. PSMU may reduce family life satisfaction, and low family life satisfaction may result in lower levels of social connectedness. Therefore, one of the reasons for low level of family life satisfaction may be PSMU, and one of the reasons for a low level of social connectedness may be low level of family life satisfaction.

Social connectedness is considered an important area in adolescent development. The results of the present study emphasize that we need to consider two important variables when working with the developmental structure of social connectedness. Social connectedness plays a critical role in adolescent psychological and social development (Lee and Robbins 1995, 1998). In recent years, there has been an increasing number of studies showing that problematic social media use negatively affects social connectedness (Allen et al. 2014; Ryan et al. 2017; Savci and Aysan 2017). However, much less is known about the variables that have mediator and moderator effects on the relationship between these two variables. Consequently, it is necessary to examine social connectedness with all its relationships in order to support the development of healthy social connectedness among adolescents.

**Funding** The authors received no financial support for this study.

## Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflict of interest.

**Ethical Approval** All procedures performed in this study involving human participants were in accordance with the ethical standards of university's research ethics board and with the 1975 Helsinki declaration.

**Informed Consent** Informed consent was obtained from all participants.

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