

Research

The mediating role of social connectedness in the relationship between smartphone use and psychological adjustment problems in Turkish youth

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Abstract

This study investigated the mediating role of social connectedness in the relationship between excessive smartphone use and psychological adjustment problems. 484 young adults ($M = 27.04 \pm 4.36$ years and 72.1% females) participated in this study. Using an online survey, participants completed the Multidimensional Smartphone Use Scale, Social Connectedness Scale-Revised, and Brief Psychological Adjustment-6. The results showed that smartphone use had a significant predictive effect on social connectedness and psychological adjustment problems. Social connectedness also had a significant predictive impact on psychological adjustment problems. Further, social connectedness partially mediated the relationship between smartphone use and psychological adjustment problems. The findings are fruitful in terms of presenting evidence for tailoring prevention and intervention programs to mitigate the adverse consequences of smartphone use on psychological health.

Keywords Smartphone use · Social connectedness · Psychological adjustment problems · Turkish young adults · Mediation model

1 Introduction

Smartphones, which emerged as a result of technological developments, have become an indispensable part of our lives, for all age groups. One of the most basic reasons for smartphones being at the very center of our lives is the opportunities they provide such as distant communication and instant information [1]. They at the end of the day are the devices which satisfy our socio-psychological needs as well. Smartphones help us keep in touch with our friends and close family members through many social media platforms and multiple applications [2]. Smartphones, especially with the convergence power provided by the internet, have become not only a tool that provides end-to-end communication but also information and social gateway, a safe box to keep our visual (video and photos) and written memories, a shopping and commercial centre, an entertainment console and a personal assistant that made them become an integral part of people's daily lives [3–6].

Being one of the media and psychology approaches, *uses and gratification theory*, indicates that people use the mass communication tools for their own needs and desires like information, entertainment, and education. Once they see

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their needs are met by the media outlets, they are satisfied [7]. Smartphones are also used by young people for different reasons such as education, communication, games, entertainment and spending time. Among other reasons, Sevi et al. [8] state that individuals also use mobile phones to create social relationships and perceive the messages they receive as gifts. Kanmani et al. [9] concluded that individuals use smartphones for reasons such as correspondence with family or friends, checking social media, listening to music, and searching for information on the internet. With these results, it can be stated that the use of smartphones by young people has increased and even turned into a passion [10]. In particular, young people benefit from smartphones for many reasons such as ease of use, portability, providing comprehensive learning experiences, providing multiple resources, and enabling multitasking [11]. Some other studies which focus on the relationship between smart-phone usage and education suggest that individuals use smartphones for accessing educational content, online chatting, blogging, connecting to social networks and sharing between peer groups [11–16].

Regardless of what smartphones are used for, they are now at the very centre of individual lives. Although there are many innovations and conveniences that smartphones bring to human life, excessive, careless and unconscious use creates some problems too. These problems may appear to be physical and/or psychological based on the usage styles and situations of individuals. Improper use of smartphones can seriously impair individuals' lives and negatively affect their social relationships [1, 17]. Physical problems here might be bodily health problems such as vision problems, pain in the wrists and neck, as well as different musculoskeletal problems [18, 19].

Another issue with smartphone usage and social media activities is the relationship the user builds with the social media influencer and/or the famous person which is called parasocial interaction. This interconnection with the audience and the social media personality or celebrity looks very much the same with the conventional media characters such as the movie protagonist or the main character of the show. Although parasocial interaction is mostly discussed within the context of traditional media (TV, radio, cinema, newspapers) it is possible to extend this concept to new and social media platforms. This type of relationship starts when the audience or the followers on social media heavily identify themselves with the media personality or social media influencer [20].

The followers or the viewers believe they are connecting with a celebrity from the media just like in real-time and daily life. They start to imitate the influencer or the media personality in their everyday behaviours. Try to talk, treat, gesture, and/or wear just like the celebrities do. The more the viewer/follower trusts the celebrity the more they keep loyal and directly connected to (social) media persona. However, here it is necessary to emphasise that because digitally mediated contacts are novel, human brains seem to process parasocial interactions faster than real-life interpersonal interactions. Even though individuals are aware of how artificial the media landscape is, how they perceive and process parasocial interactions has a psychological impact on them [21]. Therefore, parasocial relationships (bond with a non-existent person, one-sided bond with an influencer) within the context of social connectedness, psychological adjustment and smartphone use could be a response and a reason for the current poor relationships in real life which may reduce social connectedness and daily relationships with real people in the real world.

Nevertheless, identifying behavioural disorders that may occur due to smartphone use is not easy. Because such disorders are not only related to physical but also psychological and social conditions [22]. Yet studies related to smartphones and their psychological and social effects indicate that excessive use of smartphones increases life stress as it decreases social connectedness. Social connectedness in this regard indicates the healthy relationship of an individual with others which provides a feeling and satisfaction of belonging and emotional support when s/he is in need. This connectedness may vary from virtual communication via online platforms to in-person interaction such as playing, watching, and hiking together which contribute to personal psychological well-being and societal cohesion [23].

However, excessive smartphone usage is also associated with previous psychopathologies such as depression, anxiety and impulsivity which hinder focus in schools and work environments, and negatively impact interpersonal relationships and academic abilities [24]. Mendoza et al. [25] found that the presence of mobile phones in the classroom distracts students and negatively affects their learning skills. The more students deal with their phones the lower grades they get in their exams. Talking about nomophobic behaviours Sharma et al. [26] state that students feel anxious and get into a panic when they cannot access their mobile phones.

Disproportionate smartphone usage impacts personal psychological adjustment mostly in a negative way although it requires rigorous analysis. "Good psychological adjustment depends upon satisfactory insight into the events and psychological changes that have occurred and a personal acceptance of these changes; an appropriate adjustment of the perception of self; a modification of beliefs and personal goals; and the acquisition of appropriate strategies to compensate as far as is possible for any residual handicap" [27]. In this regard, although it is possible to state that smartphones provide many advantages and comforts, problematic use of them has increased doubts about the possible negative

effects they may have on individuals' mental health. Here users should consider using them mindfully and moderately [28].

Putting aside the advantages and drawbacks of smartphones, their usage has become an important part of daily life today [29]. In particular, the fact that social media courses are easy to follow and make account holders more connected with their worlds and they effortlessly can share instant photos, videos and texts, they become more prone to use smartphones. Therefore, it is important to examine the mediating role of social connectedness in the relationship between smartphone use and psychological adjustment problems. Although there are studies examining the physical and psychological effects of smartphone usage, we found no study analyzing the mediating role of social connectedness in the relationship between smartphone use and psychological adjustment problems in Turkish youth which demonstrate the originality of the research and the impact it will have on future studies.

1.1 Present study

Studies have shown that smartphone addiction negatively impacts social bonding and social bridging, key indicators of close relationships and connections with others [30]. We posit that individuals addicted to smartphones or those who use them excessively may experience a decline in their levels of social connectedness in real life, potentially leading to psychological adjustment problems. Therefore, the current study aims to examine the mediating role of social connectedness in the relationship between smartphone use and psychological adjustment problems in Turkish youth. To end that, we hypothesised that (i) smartphone use would have a negative impact on social connectedness and a positive impact on psychological adjustment problems, (ii) social connectedness would have a negative impact on psychological adjustment problems, and (iii) social connectedness would mediate the impact of social connectedness on psychological adjustment problems. The hypothesized model is presented in Fig. 1.

2 Method

2.1 Participants

Participants comprised 484 Turkish young adults. There were 349 (72.1%) females and 135 (27.9%) males. They ranged in age from 18 to 33 years old with a mean age of 27.04 ($SD = 4.36$). Participation in the study was completely voluntary and no incentives were given to the participants.

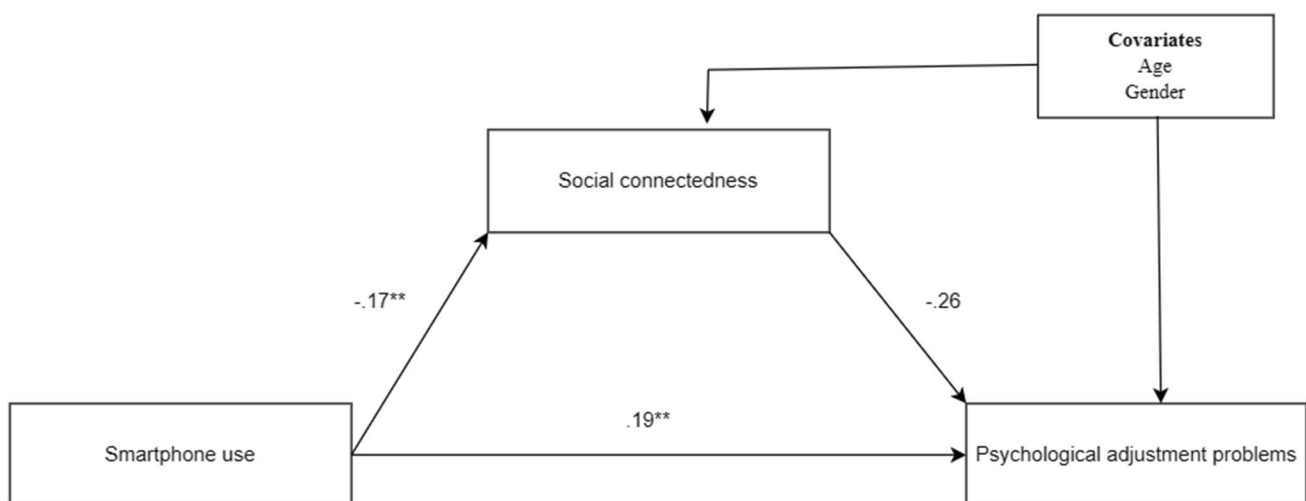


Fig. 1 The proposed hypothesized model illustrates the mediating effect of social connectedness in the relationship between excessive smartphone use and psychological adjustment problems

2.2 Measures

Multidimensional Smartphone Use Scale (MSUS; [31]). The MSUS is a multidimensional self-report scale aimed at measuring smartphone use in youth. The MSUS consists of four subscales, each comprising four items: nomophobia, ringxiety, textxiety, and phubbing. This scale includes a total of 16 items, with respondents rating each item on a 5-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate more extensive smartphone use. An example item is “I cannot keep my smartphone away from me” (nomophobia). In the initial developmental study, Geçer et al. [31] found that the MSUS exhibited good internal consistency reliability, with Cronbach’s alpha coefficients ranging from $\alpha = 0.75$ to $\alpha = 0.89$. Furthermore, the factor analytic approach yielded significant evidence supporting the bifactor model, which suggests a single underlying construct (general smartphone use) while simultaneously recognising the multidimensional nature of the construct. For this study, we computed a composite score, and Cronbach’s alpha coefficient for internal consistency was determined to be 0.89.

Social Connectedness Scale (SCS; [32]). The SCS consists of eight items, each of which is evaluated on a 6-point Likert scale, varying from 1 (completely agree) to 6 (completely disagree). A sample item is “I feel so distant from people.” Elevated scores are indicative of heightened social connectedness. The adaptation of this scale for Turkish use was carried out by Duru [33]. In the present study, the Cronbach’s alpha coefficient was found to be 0.91.

Brief Adjustment Scale-6 (BASE; [34]). The BASE is a concise 6-item self-report questionnaire, designed to measure an individual’s psychological adjustment in the face of various challenges. Respondents rate their agreement with statements such as “To what extent have you felt irritable, angry, and/or resentful this week?” on a 7-point Likert-type scale. Each item is rated from 1 (Not at all) to 7 (extremely), with higher scores indicating an elevated level of psychological maladjustment. Yıldırım and Solmaz [35] evaluated the psychometric properties of the BASE in the Turkish sample and the scale demonstrated robust internal reliability. The internal consistency estimate for the BASE in the current study was 0.91.

2.3 Procedure

The data collection method employed a convenience sampling approach for its accessibility and cost-effectiveness. This cross-sectional study gathered data via a web-based survey distributed on social networking sites such as Facebook, Twitter, and WhatsApp. Participants received information about the objectives of the study, and their informed consent was obtained prior to their participation. Those who chose to partake in the study were directed to complete an anonymous online survey, which included survey questions and requests for demographic information. No incentives were offered to participants in exchange for their participation. They were provided with information about their rights throughout and after participation, and the confidentiality and anonymity of their responses. All participants completed the survey components in the same prescribed sequence. The study was carried out in compliance with the ethical principles described in the Declaration of Helsinki.

2.4 Data analysis

Skewness and kurtosis statistics with accompanying criteria were used to check the distribution of the variables [36]. Cronbach’s alpha was used to provide evidence about the internal consistency reliability of the measures. Pearson product-moment correlation analysis was run to explore the correlation between the analysed variables in this study. After carrying out the preliminary analyses, a simple mediation model was conducted to test the mediating role of social connectedness in the relationship between smartphone use and psychological adjustment problems using the PROCESS macro (Model 4) for SPSS version 3.4 [37]. Given the advantages of the bootstrapping technique, the bootstrap method with 5000 resamples to calculate the 95% confidence intervals (CI) was conducted for indirect effect [37]. All analyses were performed utilising SPSS for Windows version 25.

2.5 Ethical statement

The research procedures comply with ethical principles for research with human participants consistent with the 1964 Helsinki Declaration and its later amendments and comparable ethical standards. Informed consent was obtained from

Table 1 Descriptive statistics, internal consistency reliability, and correlation analysis

Variable	Descriptive statistics				Reliability α	Correlation		
	Mean	SD	Skewness	Kurtosis		1	2	3
1. Smartphone use	15.24	5.13	0.26	-0.44	0.89	-	-0.18**	0.25**
2. Social connectedness	33.61	8.54	-0.23	-0.31	0.91	-	-	-0.30**
3. Psychological adjustment problems	21.43	9.41	0.29	-0.75	0.91	-	-	-

** $p < 0.01$ **Table 2** Unstandardised coefficients for the mediation model

Antecedent	Consequent			
	<i>M</i> (Social connectedness)			
	Coeff.	SE	<i>t</i>	<i>p</i>
<i>X</i> (Smartphone use)	-0.28	0.08	-3.67	<0.001
Gender	-1.58	0.87	-1.81	=0.070
Age	0.09	0.09	1.00	=0.317
Constant	38.11	2.87	13.26	<0.001
	$R^2 = .04$ $F = 6.45; p < .001$			
Antecedent	<i>Y</i> (Psychological adjustment problems)			
	Coeff.	SE	<i>t</i>	<i>p</i>
<i>X</i> (Smartphone use)	0.35	0.08	4.36	<0.001
<i>M</i> (Social connectedness)	-0.29	0.05	-6.03	<0.001
Gender	1.61	0.91	1.77	=0.078
Age	-0.03	0.09	-0.34	=0.733
Constant	23.91	3.52	6.80	<0.001
	$R^2 = .13$ $F = 18.68; p < .001$			

Number of bootstrap samples = 5000

SE: standard error; Coeff: unstandardised coefficients; *X*: independent variable; *M*: mediator variable; *Y*: outcome variable

all the individual participants included in the current study. Ethical approval was obtained from the authors' university (University of Health Sciences, Istanbul; Approval Number: 116.2017.158-Dated 04.06.2020) before the data collection took place.

3 Results

Before testing the mediation analysis, we carried out a correlation analysis to explore the correlation between the variables of this study. The findings from the Pearson correlation analysis (see Table 1) showed that smartphone use was negatively correlated with social connectedness ($r = -0.18, p < 0.001$) and positively correlated with psychological adjustment problems ($r = 0.25, p < 0.001$). Also, social connectedness was negatively correlated with psychological adjustment problems ($r = -0.30, p < 0.001$). Table 1 also indicated the values of skewness (range = -0.23 and 0.29) and kurtosis (range = -0.75 and -0.31) statistics that suggest no violation regarding the distribution of the variables as they fell within a "good" range of normal distribution of $|1|$ [36].

Following the preliminary analysis, a mediation analysis using Model 4 in SPSS Macro PROCESS was conducted to test the proposed hypothetical model. The results are presented in Table 2 and Fig. 1. In the model, we controlled for the effects of age and gender. The findings did not indicate significant effects of age ($\beta = 0.05, p = 0.317$) and gender ($\beta = -0.08, p = 0.070$) on social connectedness. Age ($\beta = -0.03, p = 0.733$) and gender ($\beta = 1.61, p = 0.078$) also did not

have significant effects on psychological adjustment problems. Additionally, the results also revealed that smartphone use significantly predicted social connectedness ($\beta = -0.17, p < 0.001$) by explaining 4% of the variance in social connectedness. Furthermore, smartphone use ($\beta = 0.19, p < 0.001$) and social connectedness ($\beta = -0.26, p < 0.001$) had significant predictive effects on psychological adjustment problems. Together, these variables accounted for 14% of the total variance in psychological adjustment problems. The indirect effect of smartphone use on psychological adjustment problems through social connectedness was significant ([effect = 0.08, 95%CI (0.03, 0.13)]. These results present evidence that smartphone use predicts psychological adjustment problems via social connectedness. This suggests that social connectedness partially mediates the relationship between smartphone use and psychological adjustment problems.

4 Discussion

The rise of digital technologies, particularly social media platforms and smartphones, has revolutionised global connectivity [29]. Platforms like Instagram, TikTok, and Twitter have transformed communication, information consumption, and our perception of the world [38]. However, alongside these benefits, excessive screen time and intensive social media use have had negative impacts. Tang et al. [39] noted changes in family dynamics due to prolonged screen time, while some individuals now prefer online communities over face-to-face interactions, impacting their psychological adjustment [40]. This shift has led researchers to redefine social connectedness, considering online interactions' positive and negative effects on psychological adjustment. In this regard, the current study provided evidence that supports the impact of smartphone use on psychological adjustment problems through social connectedness.

Our study revealed that social connectedness partially mediates the relationship between smartphone usage and psychological adjustment issues. These findings support our hypothesis that smartphone use negatively affects social connectedness while positively impacting psychological adjustment problems. Social connectedness also exerted a significant predictive influence on psychological adjustment problems. Importantly, there is a significant indirect effect of smartphone use on psychological adjustment issues via social connectedness, further confirming our hypothesis that social connectedness mediates the relationship between smartphone use and psychological adjustment problems. These findings offer evidence that excessive smartphone usage, mediated by social connectedness, predicts psychological adjustment problems. This implies that individuals who excessively use smartphones may experience poor social connectedness, consequently associated with psychological maladjustment issues.

While online interactions have streamlined communication, they have also sparked debates about the quality of social connectedness facilitated by social media and smartphones. Discussions revolve around the authenticity of relationships, sense of belonging, and social rituals, all of which influence psychological well-being [41]. Smartphones, alongside other new media technologies, have expanded the scope of social connectedness, allowing users to connect with individuals from diverse backgrounds, form romantic relationships, and pursue job opportunities globally. These connections have strengthened social bonds and facilitated psychological adjustment, leading users to spend prolonged periods online [42].

Early studies suggest that social media users not only maintain existing social connections but also establish new ones across various contexts through smartphone applications [43]. Similarly, Zhao et al. [44] found that social media platforms and smartphones facilitate connections with new individuals and rekindle old friendships, thereby fostering a sense of belonging and mitigating social isolation. Choi and DiNitto [45] highlighted the role of online communication in providing emotional support and enhancing psychological adjustment, thereby positively influencing individuals' psychological well-being. Moreover, smartphones and new media technologies offer users platforms to connect with like-minded individuals, potentially boosting self-esteem and fostering a sense of personal validation [46]. Additionally, online connectivity provides a less intimidating avenue for individuals with social phobia to engage with others, mitigating fears of embarrassment and discrimination [47].

However, it is important to note that not all forms of smartphone applications contribute positively to psychological adjustment problems; some may even hinder it. Excessive smartphone usage over time can lead to social isolation, which individuals may not initially recognise. Excessive screen time can diminish face-to-face interactions, weakening real-world relationships and exacerbating feelings of loneliness [48].

Moreover, excessive use of smartphones can foster a world of unrealistic ideals. When individuals idealise social media influencers, it often leads to increased screen time on smartphones. This behavior can jeopardise psychological adjustment as it fosters parasocial interactions, resulting in personal comparison and the paradox of choice. This, in turn, triggers negative psychological emotions such as inadequacy, depression, and imposter syndrome [49]. Consequently,

social comparison stemming from smartphone usage diminishes self-esteem and exacerbates psychological distress and adjustment issues, including anxiety and social withdrawal [50]. Our study similarly indicates that while smartphone usage positively relates to psychological adjustment problems, social connectedness is negatively associated with psychological adjustment problems.

5 Implications

In today's society, individuals inevitably interact with various social media platforms and new media technologies like smartphones and computers. However, they must exercise caution and responsibility in their usage to mitigate potential psychological risks. As indicated by the aforementioned studies, failure to do so can lead to challenges in psychological adjustment and social connectedness. Therefore, the findings of this article hold significant implications. They presented evidence that can inform the development of preventive measures and intervention strategies aimed at reducing the adverse effects of smartphone usage on psychological adjustment problems, taking into account the role of social connectedness. Intervention strategies aimed at mitigating the impact of smartphone usage on psychological adjustment problems in young individuals can adopt an effective approach, with a primary focus on fostering social connectedness.

6 Limitations

While our study yielded useful findings, it is important to acknowledge several limitations that may hinder its contributions to the existing literature. Firstly, our study adopts a primarily cross-sectional approach, meaning that it analyzes data collected at a single point in time. This research design cannot track changes in the variables of interest over short or long durations. Therefore, future research in this area should consider employing longitudinal studies to overcome this limitation. Secondly, the study relied solely on self-reported data collected through online forms. Despite ensuring anonymity, the context in which respondents completed these forms may have influenced the sincerity of their responses. Therefore, future research should explore alternative data collection methods to mitigate the influence of environmental factors. Adopting such approaches would provide a more precise understanding of problematic smartphone usage and the mediating effects of social connectedness on the association between excessive smartphone use and psychological adjustment issues. Thirdly, our sample predominantly consisted of Turkish young adults. However, it is crucial to recognise that other demographic groups, such as adolescents and middle-aged individuals, also grapple with excessive smartphone usage and may face even more severe consequences. Subsequent research should aim to include a broader range of populations. Last but not least, future research should seek to replicate the proposed model in diverse contexts to determine whether the emerging findings hold true across different cultures and settings, especially by considering potential confounding factors that may influence the relationships among variables.

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Author contributions MY designed the study and wrote the method and results sections. EG wrote the introduction, and HB wrote the discussion section. All authors approved the final manuscript version.

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Data availability The data supporting this study's findings are available from the corresponding author, [MY], upon reasonable request.

Declarations

Ethical approval and consent to participate All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Consent was obtained from all participants included in the study.

Competing interests We confirm that there is no conflict of interest associated with this publication. The authors declared no conflicts of interest with respect to the research, authorship, and/or publication of this article.

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