Vulnerability and Relationship Satisfaction: Mediation of Smartphone Addiction

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ABSTRACT

The present study aimed to investigate the mediating role of smartphone addiction in the association between vulnerability and relationship satisfaction among younger adults living in Turkey. The relationship assessment scale, the smartphone addiction scale-short version, the psychological vulnerability scale, and the social vulnerability scale were applied to 326 university students. Structural equation modelling showed that vulnerability has a significantly direct effect on relationship satisfaction, and smartphone addiction can partially mediate the impact of vulnerability on relationship satisfaction. The bootstrapping techniques confirmed that smartphone addiction had a partial mediation effect between vulnerability and relationship satisfaction. These data may help clinicians and researchers to better understand the consequences of vulnerability and underlying the processes of smartphone addiction and relationship satisfaction.

KEYWORDS

Relationship Satisfaction, Smartphone Addiction, Structural Equation Modeling, Vulnerability

INTRODUCTION

Perhaps Alexander Graham Bell, inventor of the telephone, did not imagine that telephones would evolve so much, from dial, desk-set, and touch-tone telephones, to videophones, mobile phones, and now, a new generation of smartphones, which have become an integral part of our daily lives. Thanks to wireless and 4G connections, smartphones offer important advantages, like access to email, instant messaging, multimedia, and the ability to download applications (Aljomaa et al., 2016). In addition, the ease of accessing popular social media websites and planning our lives through an agenda program may be considered among the smartphone’s many advantages. The use of smartphones increases each day because of such advantages and competitive approach. Globally, the number of smartphone users has increased from 1.57 billion in 2014 to 2.71 billion in 2019 (Statista, 2019). In Turkey, the number of smartphone users now exceeds 31 million, or 38% of the total population (TRT News, 2019).

In addition to their advantages, smartphones have also caused many problems due to excessive use and their increasing popularity. In this respect, a new phenomenon has emerged, smartphone addiction, a term which has been used interchangeably with problematic mobile phone use, mobile phone addiction, and excessive smartphone use (Kim et al., 2016). In fact, thanks to the simplicity of
adding new applications to a mobile phone and the addition of enhanced content, smartphone usage and addiction rates have become more widespread (Gökçearslan, Mumcu, Hasılmam, & Çevik 2016). In this study, the concept of smartphone addiction is used as the preferred terminology. Smartphone addiction can be defined as the negative effects experienced by individuals due to an inability to control their smartphone usage leading to failure in controlling their excessive usage or impulses (Liu, Yang, Lin, Yu, & Zhou, 2017).

Although smartphone addiction is a rather new concept, and is not included in the DSM, studies of this phenomenon have increased in recent years. However, the indications and consequences of smartphone addiction have not yet been fully established (Cocorada Maican, Cazan, & Maican, 2018). Young adults spend more time in virtual environments rather than forming real relationships. According to Wood’s (2018) report, young people spend mean eight-ten hours on their phones every day. As a result, questions are raised about what the causes and outcomes will be both personally and interpersonally of spending the majority of the day interacting over the phone and being this addicted to smartphones. From this aspect, it is necessary to investigate the protective factors and risk factors for smartphone addiction. However, the studies investigating the underlying causes of smartphone addiction and the outcomes of addiction are still limited in number. Motivated by this lack of research, a new data has been added to the existing literature about smartphone addiction. Additionally, as the majority of smartphone addiction studies have been conducted in East Asia (Enez-Darcin et al., 2016), this study will be completed in Turkey, which has a growing number of smartphone users, and will provide insight into the connection between smartphone addiction, vulnerability, and relationship satisfaction as experienced by young people living in Eurasia.

CONCEPTUAL DEVELOPMENT AND RESEARCH HYPOTHESES

Vulnerability and Smartphone Addiction

Vulnerability is defined as the cognitive beliefs that develop regarding one’s achievements or self-value and which are dependent upon success or external approval (Sinclair & Wallston, 1999). Two significant components of vulnerability are psychological and social vulnerability. Psychological vulnerability is described as the cognitive structures that make individuals become more sensitive to stress and social dependence, self-perfectionism, negative attitudes, and other mechanisms that involve blaming oneself or one’s situation (Sinclair & Wallston, 2010). Social vulnerability is defined as the condition in which an individual is prone to being socially deceived and/or abused due to his/her purity and easy belief (Sarıçam, 2015). In both types of vulnerability, a lack of compliance and a sensitivity to damage are emphasized (Adger, 2006).

Vulnerability is dealt with as an important construct that may cause psychological problems (Satıcı, Uysal, Yılmaz, & Deniz, 2016). Vulnerability may cause mental disorders, weak coping skills, emotional risks, and substance abuse (Dennis, Davis, Chang, & McAllister, 2017). Vulnerable individuals can become more sensitive to the risks of everyday activities and are therefore more susceptible to addiction (Amankwaa & Blay, 2018). In this context, it is considered that vulnerability may play a role in the increasing rates of smartphone addiction, which is described as a type of behavioral addiction. In addition, earlier studies have shown that vulnerability is a factor that can increase rates of behavioral addiction (e.g., Blaszczynski & Nower, 2002; Dennis et al., 2017). The relationship between vulnerability and gambling addiction, in particular, has been examined. Gambling and smartphone addictions are very similar (Jeong, Suh, & Gweon, 2019). Previous studies have tried to explain smartphone addiction by examining the criteria for pathological gambling, as outlined in the DSM (Jeong et al., 2019). For example, Lévesque, Sévigny, Giroux, and Jacques (2018) reported that vulnerability can affect the seriousness of a gambling problem, and Parke et al. (2018) determined that vulnerable individuals might become addicted to gambling. At the same time, vulnerability appears to have a role increasing other technology addictions. Satıcı et al. (2014)
proposed that psychological vulnerability may trigger social media addiction. Additionally, those who are vulnerable in psychological terms have higher probability of developing a psychopathology, are more affected by events compared to others and attract attention due to more negative stimuli with poor psychological status (Ingram & Ritter 2000). As a result, it is considered that those who are vulnerable have higher probability of smartphone addiction involvement, a behavioral addiction, than those who are not vulnerable. In light of these theoretical and research findings, the following hypothesis was proposed:

**H1:** Vulnerability positively predicts smartphone addiction.

**Smartphone Addiction and Relationship Satisfaction**

Romantic relationship satisfaction is defined as the perception of positive personality traits as more obvious than negative traits (Bradbury, Fincham, & Beach, 2000). At the same time, romantic relationship satisfaction is described as perceptions related to the degree to which partners meet each other’s desires and needs (Peleg, 2008). Romantic relationship satisfaction expresses the feelings, thoughts, and behavior in relation to the relationship (Hendrick, 1988). Additionally, it is understood that satisfaction obtained from a relationship is an assessment involving whether there is any problem in the relationship or not and whether regret is felt about starting the relationship (Fincham, Rogge, & Beach, 2018). Romantic relationships, which are basic necessities for life, and the satisfaction gained from such relationships might contribute to individual mental and physical health in some ways. For this reason, it is important to introduce indicators that might strengthen or weaken an individual’s relationship satisfaction. In this context, smartphone addiction, which can interact with an individual’s work, social, and family life, may be a significant variable that can predict relationship satisfaction, a hypothesis which is supported by the related literature.

The increasing presence and use of smartphones make the relationship between the interests of individuals and partners more complicated (Lenhart & Duggan, 2014). Though smartphones present individuals with connections in terms of virtual social networks, excessive focus on these networks and addiction may cause relational damage (Kross et al., 2013; Turkle 2011). Roberts and David (2016) reported the negative effects of smartphone addiction on romantic relationship satisfaction, while Lee et al. (2014) described the continuous use of a smartphone as an addiction and reported that checking a smartphone is a habit. In this respect, the repeated use of a smartphone can cause the interactions between couples to decrease and the relationship satisfaction to become impaired (Coyne, Padilla-Walker, Fraser, Fellows, & Day, 2014).

Individuals who have become addicted to their smartphones might not be able to communicate in a face-to-face manner without thinking about or checking their phones (Kuss & Griffiths, 2017). Smartphone usage by an individual who is addicted can become distracting within a relationship (van Duerson, Bolle, Hegner, & Kommers, 2015) and can cause the relationship satisfaction to decrease. Even the perceived proximity and existence of a mobile phone, outside the realm of a smartphone addiction, has been found to weaken connectivity and relationship quality (Przybylski & Weinstein, 2013). As a result of spending more time on phones, significant interaction between partners may reduce, sharing may weaken and thus relationship satisfaction levels will fall (Coyne et al., 2014). Additionally, addiction to smartphones is known to reduce relationship satisfaction as a result of increased discontinuation, ignoring and jealousy in the relationship (McDaniel & Coyne, 2016; Nazir & Pişkin 2017). Hence, individuals with smartphone addiction do not just reduce the amount of time spend in their relationships, at the same time, they significantly harm the quality of time spent with their partners and strengthen dissatisfaction in the relationship. As seen in the relevant literature, it is clear that smartphone addiction can interfere with the perceived quality of individual relationships. Based on these theoretical explanations and research results, the following hypothesis has been developed:
H2: Smartphone addiction negatively predicts romantic relationship satisfaction.

**Mediating Impact of Smartphone Addiction**

It has been posited that arguments about smartphone addiction will mediate the impact of vulnerability on relationship satisfaction. Some of the studies included in the literature have dealt directly with these variables. For example, Orth, Robins, and Roberts (2008) described the vulnerability model as a risk factor for starting and maintaining interpersonal and intrapersonal negativity. When considered in this context, vulnerable individuals may be inclined toward smartphone addiction when faced with challenging life experiences (Hong & Cheung, 2015). Affected by challenging experiences, their relationship satisfaction can easily decrease. In addition, vulnerable individuals are more likely to suffer from existing daily problems (Blaszczynski & Nower, 2002), which might cause them to avoid problems by engaging in their smartphone addiction. However, escaping from daily problems will delay their resolution and weaken relationship satisfaction (Polezoes, 2017). Furthermore, vulnerability may develop into hopelessness (Satici & Uysal, 2017), which can lead to a deeper level of addiction and can further weaken relationship satisfaction. In periods with high vulnerability levels, it is proposed that the quality of the relationship between partners weakens, and romantic dissatisfaction is experienced (Ingram & Price, 2010). Similarly, Baron et al. (2006) emphasized that psychological vulnerability markers were effective in disrupting partner adjustment. This is because vulnerable individuals have higher interpersonal sensitivity and have less defense against experiencing problems in romantic relationships (Ingram & Price, 2010). The rooted theory about relationship satisfaction in the investment model emphasizes that relationship satisfaction is strengthened by emotional interest and time (Rubust, 1983). As a result, individuals with vulnerable experiences may not sufficiently feed their partner’s emotional interest; if they are addicted to smartphones, they may not allot sufficient time to the relationship and relationship satisfaction will weaken. Additionally, individuals experiencing vulnerability are open to developing psychological disorders (Satici et al., 2016), which may cause them to have a tendency toward the behavioral addiction of smartphone addiction. Experimental and cross-sectional studies have also reported that vulnerability may lead to addiction (e.g., Levesqu et al., 2018; Parke et al., 2018) and that this addiction might cause decreased levels of relationship satisfaction (e.g., Polezoes, 2017; Roberts & David, 2016). Based on these explanations, the following hypothesis has been developed:

**H3:** The connection between vulnerability and relationship satisfaction can be mediated via smartphone addiction.

The hypothesized mediation model has been given in Figure 1.

**METHOD**

**Participants and Procedure**

A sample of 326 volunteer students from two Turkish universities, was used. Considering Jackson’s (2003) N:q rule and Kline’s (2011) statement of 10 samples per parameter, the sample number in this

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**Figure 1. Hypothesized mediational model**

- Vulnerability
- Smartphone Addiction
- Relationship Satisfaction
study can be said to be very sufficient for structural equivalence modelling. Additionally, the study aimed to reach university students who had experienced romantic relationships at least once in their lives. With the non-probabilistic convenience sample, the researcher obtained data from two close state universities. Data were obtained face-to-face using paper-pencil questionnaire in a classroom environment. The written informed consent of the study participants was acquired. Data was collected from only volunteer students with emphasis on volunteer participation.

The gender distribution was 167 (51.2%) females and 159 (48.8%) males. The ages of the participants ranged between 18 and 27 years old \( (M = 21.23, \text{SD} = 1.77) \). In terms of distribution by grade, 80 (24.5%) are enrolled in 1\(^{st}\) grade, 83 (25.5%) are in 2\(^{nd}\) grade, 81 (24.8%) are in 3\(^{rd}\) grade, and 82 (25.2%) are in 4\(^{th}\) grade. The number of romantic relationships that the participants have experienced to date is between 1 and 10 \( (M = 3.40, \text{SD} = 2.17) \). The average daily usage times of the smartphones range from 60 to 630 minutes \( (M = 274.57, \text{SD} = 115.43) \).

Measures

- **Relationship Satisfaction:** To assess general relationship satisfaction the Relationship Assessment Scale (Hendrick 1988) (Turkish adaptation – Curun, 2001) was used. The scale consisted of seven items (e.g., How good is your relationship compared to most) on a seven-point scale ranging from 1 (low) to 7 (high). Higher scores indicate more relationship satisfaction level. Curun (2001) reported that Cronbach’s \( \alpha \) for the scale was 0.86. The reliability coefficients of the Turkish version of the scale in the present study was found to be excellent \( (\alpha = .87) \).

- **Smartphone addiction:** To assess smartphone addiction the Smartphone Addiction Scale-Short Version (Kwon et al., 2013) (Turkish adaptation – Noyan, Enez-Darcin, Nurmedov, Yilmaz, & Dilba, 2015) was used. The scale consisted of 10 items (e.g., Missing planned work due to smartphone use) on a six-point scale ranging from 1 (strongly disagree) to 6 (strongly agree). Higher scores indicate increased smartphone addiction. Noyan et al., (2015) reported that Cronbach’s \( \alpha \) for the scale was 0.87. The reliability coefficients of the Turkish version of the scale in the present study was found excellent \( (\alpha = .91) \).

- **Vulnerability:** To assess vulnerability the Psychological Vulnerability Scale (Sinclair & Wallston, 1999) (Turkish adaptation – Akin and Eker 2011) and the Social Vulnerability Scale (Pinsker, Stone, Pachana, & Greenspan, 2006) (Turkish adaptation – Saricam, 2015) were used. The Psychological Vulnerability Scale (PVS) consisted of six items (e.g., I am frequently aware of feeling inferior to other people) on a five-point scale ranging from 1 (unsuitable to me) to 5 (suitable to me). Akin and Eker (2011) reported that Cronbach’s \( \alpha \) for the PVS was 0.75. The Social Vulnerability Scale (SVS) consisted of 15 items (e.g., Believes things that are clearly untrue) on a five-point scale ranging from 0 (never) to 4 (always). Saricam (2015) reported that Cronbach’s \( \alpha \) for the SVS was 0.94. Higher scores on both scales indicate greater vulnerability. The reliability coefficients of the Turkish version of the PVS and SVS in the present sample was found acceptable \( (\alpha = .73 \text{ and } .85, \text{respectively}) \).

Statistical Analyses

IBM SPSS Statistics 22 and AMOS Graphics were employed to data analysis. Descriptive statistics for relationship satisfaction, smartphone addiction, and vulnerability scores were presented using means, standard deviations, skewness, and kurtosis. Also, correlation coefficients were used to investigate the relationship between these variables.

Structural equation modelling (SEM) was used to test the mediating role of smartphone addiction on the association between vulnerability and relationship satisfaction. The two-step approach, suggested by Anderson and Gerbing’s (1988), was used in this study. First, the measurement model was evaluated. Secondly, the structural model was examined. After confirmation of the measurement model, the structural model was evaluated. Consistent with statistical recommendations, goodness of
fit will be supported when the comparative fit index (CFI), the goodness of fit Index (GFI), Tucker-Lewis index (TLI), and normed fit index (NFI) exceed .90 and standardized root mean square residual (SRMR) and the root mean square error of approximation (RMSEA) are less than .08 (Hu & Bentler, 1999; Quintana & Maxwell, 1999; Weston & Gore, 2006).

After establishing the structural model, in order to test for significance of indirect effects, bootstrapping coefficients and confidence intervals were produced in SEM. The analysis was conducted using 5000 bootstrap samples based on general recommendations. Finally, the mediating role was confirmed if the 95% CI of the bootstrapping did not include 0.

RESULTS

Preliminary Analysis

First, the descriptive statistics and variable correlations were given in Table 1. As expected, statistically significant correlations were identified among variables in the present hypnotized model. Results reported in Table 2 indicated that relationship satisfaction was negatively correlated with smartphone addiction (r = -0.33, p < 0.01), psychological vulnerability (r = -0.28, p < 0.01), and social vulnerability (r = -0.35, p < 0.01). Furthermore, it was found that smartphone addiction was positively related to psychological vulnerability (r = 0.31, p < 0.01) and social vulnerability (r = 0.27, p < 0.01). Since correlation between variables are accepted as weak when value of r is 0.20-0.39 (Evans, 1996), it can be concluded that the correlations between variables in this study were found to be weak.

Before investigating the direct and indirect effects in the structural model created to test the mediation of smartphone addiction between vulnerability and relationship satisfaction, the SEM assumptions were investigated. At the end of the analysis, the VIF values varied from 1.076 to 1.152 and as a result, no VIF value was > 2. Additionally, tolerance value varied from 0.87 to 0.93; in other words, were identified to be above 0.2. As a result, considering Field’s (2016) recommendations, the study did not have a multicollinearity problem. Finally, using Harman’s single factor score, common method bias (CMB) was checked (Mat Roni, 2014). The single factor was observed to explain 41% of the total variance and as the cut-off point was below 50%, it was understood there was no CMB problem.

Measurement Model

Before examining the hypothetical model, the measurement model was tested. Eight observed variables and four latent variables, namely, relationship satisfaction, smartphone addiction, psychological vulnerability and social vulnerability, were comprised in the model. The measurement model had an acceptable fitness as indicated by \( \chi^2 (14, 326) = 50.18, p < .001, \text{CFI} = .97, \text{GFI} = .96, \text{TLI} = .94, \text{NFI} = .96, \text{SRMR} = .04, \) and \( \text{RMSEA} = .08. \) Standardized factor loadings (ranged .73 to .90) for the latent variables (relationship satisfaction, smartphone addiction, psychological vulnerability and social vulnerability) were statistically significant.

Table 1: Correlation and descriptive statistics about the study variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Correlations</th>
<th>Descriptive Statistics</th>
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<td>2</td>
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<tr>
<td>1. Relationship satisfaction</td>
<td>–</td>
<td>–</td>
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<tr>
<td>2. Smartphone addiction</td>
<td>-.33**</td>
<td>–</td>
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<tr>
<td>3. Psychological vulnerability</td>
<td>-.28**</td>
<td>.31**</td>
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<tr>
<td>4. Social vulnerability</td>
<td>-.35**</td>
<td>.27**</td>
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</table>
Structural Equation Modelling

After confirming the measurement model, a full mediation model with no direct effects between psychological-social vulnerabilities and relationship satisfaction was tested. Except for SRMR (.10) and RMSEA (.11) indices in the fully-mediated model, other indices are acceptable fit with the data: $\chi^2_{(16,326)} = 80.41, p < .001, \text{CFI} = .94, \text{GFI} = .95, \text{TLI} = .90, \text{and NFI} = .93$. Then, a partial mediation model with direct effects between psychological-social vulnerabilities and relationship satisfaction was tested. Partially-mediated model was an acceptable fit with the data: $\chi^2_{(14,326)} = 50.18, p < .001, \text{CFI} = .97, \text{GFI} = .96, \text{TLI} = .94, \text{NFI} = .96, \text{SRMR} = .04, \text{and RMSEA} = .08$. A scaled chi-square difference test indicated that the partially-mediated model was significantly different from the fully-mediated model ($\Delta \chi^2 = 30.23, df = 2, p < .001$). Consequently, partially-mediated model was preferred considering both the chi-square difference test and fit indices. As a result, according to the partial mediation model, psychological and social vulnerability increase smartphone addiction and this increase may weaken relationship satisfaction. Additionally, vulnerabilities may directly weaken relationship satisfaction. According to the partial mediation model, psychological and social vulnerability explain 20% of the total variance in smartphone addiction ($R^2 = .20$). Psychological and social vulnerability and smartphone addiction predicted 28% of the total variance in romantic relationship satisfaction ($R^2 = .28$). The standardized factor loadings of the partial mediator model are presented in Figure 2.

Bootstrapping

The mediating role of smartphone addiction was examined via bootstrapping based on 5,000 bootstrap samples with replacement, as presented in Table 2. The 95% confidence interval revealed that the unstandardized indirect effects of psychological vulnerability (bootstrap estimate = -.085, 95% CI = -.19, -.01) and social vulnerability (bootstrap estimate = -.091, 95% CI = -.21, -.02) on relationship satisfaction did not contain zeros, suggesting smartphone addiction as a mediator. Despite a small difference, smartphones appear to have higher indirect effect between psychological vulnerability and relationship satisfaction.

DISCUSSION

This study examines the connections between vulnerability, smartphone addiction, and relationship satisfaction among young adults, referred to as the “wired generation” (Barnes, 2009). To complete this study, three hypotheses were developed based on theoretical explanations and research findings. Each of these three hypotheses were confirmed by the results of the study.

Figure 2. Standardized factor loadings for the final structural model (Note: N=326;**p<.01)
The first hypothesis determined a positive relationship between vulnerability and smartphone addiction. The characteristics of vulnerable individuals might lead them toward addiction, as they are more sensitive to risks (Amankwaa & Blay, 2018), and those who lack agreement may tend to use smartphones problematically (Horwood & Anglim, 2018). The fact that vulnerable individuals tend to be fooled again and again, despite obvious warnings (Greenspan, Loughlin, & Black, 2001), is another possible explanation for the increase in addiction rates. Smartphone addiction indicates engagement, which, in turn, results in uncontrollable and excessive use of, and obsession with, one’s smartphone (Aljomaa et al., 2016). The literature illustrates the similarities between vulnerability and smartphone addiction and positively predicts addiction to both social media (Satici et al., 2014) and gaming (Levesqu et al., 2018), which are explained through the same criteria. Therefore, as vulnerable individuals are more easily affected by negative events, it is understood they have higher chance of being addicted to smartphones. Additionally, considering dealing with vulnerability may cause behavioral problems like inability to cope and substance abuse (Dennis et al., 2017), it can be inferred that vulnerability may increase smartphone addiction. For this reason, it is possible to argue that the results obtained by this study are logical.

The second hypothesis was that smartphone addiction can predict negative relationship satisfaction. This hypothesis may be discussed in various ways. Smartphone addiction may cause a decrease in social skills (Sleeper, 2018), may cause addicted individuals to feel the need to continuously check their phones (Lee et al., 2014), and may lead to difficulties communicating face-to-face (Kuss & Griffiths, 2017). In romantic relationships, because of the distractions that occur as a result of excessive mobile phone usage, shared time together may decrease and satisfaction with the romantic partner may be reduced (van Duerson et al., 2015). For this reason, individual satisfaction is reduced among those who spend most of their time with their smartphones. Hence, though individuals with smartphones have created a network and interaction in virtual environments, in the real world they may experience weakening and lowering of quality in relationships with romantic partners and relationship dissatisfaction. The second possible explanation for this finding is that relationship satisfaction will decrease due to miscommunication by smartphone addicts. Individuals who are addicted to their smartphones might turn themselves off when communicating or might misunderstand or misinterpret events in a negative light (Polezeos, 2017); such individuals may increasingly misuse communication by causing conflicts within their relationships because they communicate in this manner. A third possible explanation for this hypothesis might be jealousy, as individuals who are addicted to their smartphones may ignore their partners, which can lead to feelings of jealousy and
neglect in individuals who feel that their partners consider them less important than a smartphone (Polezoes, 2017; Roberts & David, 2016). These explanations suggest that this hypothesis corresponds with the results of previous studies.

The final hypothesis posits that smartphone addiction acts as a mediator between vulnerability and relationship satisfaction. This mediation may be explained through several points. First, vulnerable individuals may compensate for their smartphone addiction as they tend to display deceit in real life (Greenspan et al., 2001). Individuals can use their virtual networks to compensate for gaps in their real-world social lives, which is also discussed in social compensation theory (McKenna, Green, & Gleason, 2002). However, the virtual world that is established through a smartphone can harm real-world romantic relationships. Second, vulnerable individuals tend to suffer from more problems in their daily lives, which can make them addicted (Blaszczynski & Nower, 2002; Dennis et al., 2017). Individuals who suffer from daily problems tend to prefer escape over resolution, so the problems that exist in their relationships will continue to increase and the level of relationship satisfaction will decrease (Polezoes, 2017). Third, vulnerable individuals tend to emphasize the value of external approval (Sinclair & Wallston, 2010), which might lead them to use their smartphone applications, especially social media applications, in an exaggerated manner. Busying oneself on the phone can cause an individual to move away from their romantic partner (Polezoes, 2017). In this way, as the quality and quantity of shared time decreases, relationship satisfaction may also decrease. In light of the model supported in the research, vulnerable individuals will have increased levels of smartphone addiction; it can be said that as this addiction increases, romantic relationship satisfaction will reduce. Additionally, the results of the partial mediation model determined that vulnerability may directly weaken relationship satisfaction. When these theoretical and empirical findings are considered, it is apparent that these findings are acceptable.

**Implications**

In today’s fast-changing world, people experience many undesirable and painful events. The positive or negative effects of these events are related to the individual’s level of vulnerability. Quickly developing information and communication technologies have become an integral part of life, and individuals cannot easily give up their smartphones, nor are they able to live their lives on their own; they require other significant people, so satisfying relationships must be established. Discovering the connections between vulnerability (i.e., the psycho-cognitive variable), smartphone addiction (i.e., the psycho-technological variable), and relationship satisfaction (i.e., the psycho-social variable), all of which are evaluated in the scope of this study, may encourage future studies.

This study may provide beneficial implications for academics, clinicians, and policymakers. Previous studies have established relationships between pairs of variables (see Le’vesqu et al., 2018; Parke et al., 2018; Polezoes, 2017; Roberts & David, 2016). The current study contributes to this line of research by examining the link between vulnerability, smartphone addiction, and relationship satisfaction; however, findings of the current study are also expanding upon the literature, in theoretical terms, by defining smartphone addiction as a connection between vulnerability and relationship satisfaction. The discovery of the psycho-social and the psycho-technological processes that lead to smartphone addiction might provide us with a better understanding of romantic relationships and smartphone addiction.

Clinicians may focus on strengthening their resilience in order to help vulnerable individuals prevent the effects of living in difficult conditions. In this way, the negative effects of vulnerability might be minimized. Some experimental studies have indicated that individuals may be saved from vulnerability (see, for example, Van der Gucht et al., 2017), while some clinicians have argued that smartphone addiction might be reduced through intervention (see, for example, Chun, 2018; Shen & Su, 2019). Individuals may be able to improve the quality of their relationships, and obtain satisfaction from those relationships, by reducing their vulnerability and smartphone addiction. Also, in addition to vulnerability and smartphone addiction which may affect the relationship satisfaction of university
students, it may be necessary to reveal other causes. In line with this, it is recommended that studies to increase knowledge of the self and develop social skills be completed. Finally, policymakers might benefit from this model of relationship satisfaction, which must be considered an important factor in determining the duration and peacefulness of the relationship. There must be public awareness of vulnerability and smartphone addiction, as both of these can reduce levels of relationship satisfaction. Public awareness might allow policymakers, couples, and individuals to better understand that vulnerability and smartphone addiction can greatly affect individuals.

Limitations

Due to the nature of this study, there are several limitations to consider. The current study was cross-sectional in nature, which makes it difficult to derive complete causal relationships between the variables. It is recommended that future researchers employ longitudinal and experimental designs in order to clarify the direction of each variable. Additionally, it is understood that the indirect effects included in the model are very close to each other. Hence, studies in the future will be beneficial to obtain clearer information about which indirect effects are more powerful.

The second limitation stems from the self-report scales that were used in this study. Although voluntary participation was emphasized at the beginning of the study, some answers may be biased toward social desirability, as depicted in the self-report scales. Additionally, vulnerability was dealt with in multiple dimensions; however, smartphone addiction and relationship satisfaction used unidimensional constructs. However, if both smartphone addiction and romantic relationship satisfaction were dealt with in multiple dimensions, broader information could be available. Additionally, as the study was conducted among students at state universities in two different regions of Turkey, and although data from different regions were tried to be obtained, the study’s generalizability must be handled with care.

CONCLUSION

This study provides new data about vulnerability, smartphone addiction, and relationship satisfaction. The results of the study indicate that vulnerability can positively predict individual smartphone addiction and can negatively predict relationship satisfaction. The results of this study also suggest that high levels of smartphone addiction are associated with low levels of relationship satisfaction. In addition, this study determined that smartphone addiction plays a mediatory role in the connection between vulnerability and relationship satisfaction. From this aspect, it was identified that psychotechnological variables may affect the relationship satisfaction of university students. Those wishing to strengthen relationship satisfaction should reduce vulnerability and smartphone addiction levels. Additionally, this scope of this study supports the view that if vulnerability can be reduced, smartphone addiction will be reduced.

CONFLICT OF INTEREST

The author of this publication declares there is no conflict of interest.

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