

# The impacts of adult separation anxiety disorder on nomophobia

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## SUMMARY

**Objective:** Based on the idea that there may be a link between smartphone addiction and adult separation anxiety disorder (ASAD), our aim was to examine the impacts of ASAD symptoms on nomophobia and whether they predict nomophobia among ASAD patients.

**Method:** We randomly recruited 50 patients diagnosed with ASAD and 50 control subjects satisfying the inclusion criteria. We collected the data using a sociodemographic information form, the Adult Separation Anxiety Questionnaire (ASA-27), the Nomophobia Questionnaire (NMP-Q), the Beck Depression Inventory (BDI), and the Beck Anxiety Inventory (BAI).

**Results:** Fifty-four percent of the patients had moderate, and 46% showed mild nomophobia symptoms. The results revealed that, compared to healthy controls, the patients had significantly higher scores on the ASA-27, the BDI, the BAI, the NMP-Q (total), the NMP-Q not being able to access information, the NMP-Q giving up convenience, the NMP-Q not being able to communicate, and the NMP-Q losing connectedness ( $p=0.006$  for the NMP-Q giving up convenience;  $p<0.001$  for others). Moreover, the results yielded significant positive relationships between ASAD and the participants' nomophobia total and subscale scores (except for losing connectedness) ( $p<0.05$ ). Finally, ASAD scores significantly predicted nomophobia, not being able to access information, giving up convenience, and not being able to communicate.

**Discussion:** To the best of our knowledge, our study is the first to report nomophobia levels among patients diagnosed with ASAD. The increased severity of separation anxiety symptoms contributed to the severity of nomophobia in the patients, which, in turn, significantly boosted the severity of their depression and anxiety.

**Key Words:** Anxiety, separation anxiety, nomophobia, smartphones

## INTRODUCTION

Adult separation anxiety disorder (ASAD) is a prevalent mental disorder characterized by excessive anxiety about separation from an attachment figure (1). The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) has removed the age criterion for ASAD and reports that it may also give primary onset in adulthood (1). More prevalent among females, the lifetime prevalence of ASAD was previously found to be high, with an average of 4.8%, 43.1% of which is

DOI: 10.5505/kpd.2024.69862

often reported after the age of 18 (2). In the National Comorbidity Survey Replication (NCS-R), 77.5% of adults were diagnosed with lifelong ASAD, and 75.2% had their first onset in adulthood (3). While the majority of adult-onset ASAD cases are encountered in the late teens and early twenties, childhood-onset cases are prevalent in middle childhood (4). Lifetime ASAD shows high comorbidity with anxiety and related disorders and depressive disorder (3).

Attachment theory has a critical place in the etio-

**Cite this article as:** Kazgan Kılıçaslan A, Kurt O, Yıldız S, Sırlıer Emir B. The impacts of adult separation anxiety disorder on nomophobia. Turkish J Clin Psych 2024; 27:21-29

**The arrival date of article:** 02.08.2023, **Acceptance date publication:** 12.11.2023

Turkish J Clinical Psychiatry 2024;27: 21-29

logy of ASAD. Emotional attachment develops in the form of secure or insecure attachment in early childhood and affects one's whole life. Considering ASAD through the concept of attachment, ASAD was previously reported at higher rates among those with insecure and anxious attachment figures in childhood (4). The insecure attachment in childhood is a phenomenon that one maintains throughout their life (5).

Even though separation anxiety mainly arises when an infant is separated from the attached figure (usually their mother), it may also occur in adulthood, originating from the detachment with a materially tangible object. The individual finds a way to represent their own character through their attachment object (6). Today, smartphones, which are indispensable intruders of our lives, may easily become attachment objects. Therefore, nomophobia can be discussed on the basis of separation anxiety. Nomophobia, which has not yet found an official place in the DSM-5, is denoted as a phobia leading to many physical, emotional, and behavioral problems when away from smartphones (1). Although scholars have used different terms related to nomophobia, such as "smartphone addiction," the most recent term explaining smartphone separation anxiety is "nomophobia" (7).

Previous papers investigated attachment styles in the etiology of nomophobia, and the findings interestingly showed similarities with those in ASAD (8, 9). Some studies suggested that individuals with an anxious attachment style demonstrate more nomophobic characteristics (10, 11) and that such individuals tend to be more attached to their smartphones (12). Moreover, it was postulated that there is a link between smartphone addiction and ASAD (13). Attachment to smartphones appears to involve similar emotional responses in parent-infant attachment. Hence, ASAD and nomophobia, showing overlapping mechanisms regarding attachment styles, are seen as two subjects worth exploring.

So far, the research interest of nomophobia has been on the general population rather than clinical subjects. Besides, to the best of our knowledge, nomophobia levels have not been reported among

patients with ASAD. Therefore, we believe that separation anxiety disorder - a disorder that may be ignored in adult populations - deserves to be explored considering this concept. In other words, we wonder about the relationship between ASAD and nomophobia and whether ASAD predicts nomophobia. Ultimately, our aim in the present study was to explore the impacts of the symptoms and severity of ASAD on nomophobia. We suggest that in patients diagnosed with ASAD, there may be high levels of nomophobia in parallel with clinics, and that ASAD can predict nomophobia. We think that the findings may contribute to clinical insights into nomophobia and ASAD. The findings may also emphasize the need to consider the anamnesis of patients with ASAD from a broader perspective and shed new light on its treatment protocols.

## METHOD

**Power analysis:** The power analysis performed on the G\*Power 3.1 program revealed that a sample size of 52 patients should be included in the study to reach 95% power at a significance level of 0.05 in the 95% confidence interval. The thesis titled "An Investigation of Relationship Between Separation Anxiety and Parasocial Breakup Comparison with Relationship of Attachment Style and Parasocial Interaction in Adults" was taken as a reference for the power analysis. However, we could reach 50 people in our study (participation rate: 96.2%).

## Sample

**Patient group:** We randomly recruited 50 patients applying to the Elazığ Fethi Sekin City Hospital Psychiatry Clinic, treated as either inpatient or outpatient, diagnosed with ASAD according to the DSM-5 diagnostic criteria, and satisfying the inclusion criteria.

**Control group:** The control group consisted of 50 healthy volunteers applying to the Elazığ Fethi Sekin City Hospital Psychiatry Clinic, without any psychopathology according to DSM-5 criteria and a history of psychiatric disorders. These people were made up of healthy people who applied to the psychiatry outpatient clinic for a health report and patient relatives.

*Procedure:* We carried out the study in accordance with the Declaration of Helsinki after obtaining ethical approval and local permissions. After explaining the purpose and procedure of the study to all participants, we obtained their written consent. Then, the participants were administered a sociodemographic information form, the Adult Separation Anxiety Questionnaire (ASA), the Nomophobia Questionnaire (NMP-Q), the Beck Depression Inventory (BDI), and the Beck Anxiety Inventory (BAI). We explored comorbid psychiatric disorders in patients based on the DSM-5 criteria. The data collection procedure lasted 30-40 minutes per participant.

**Inclusion criteria for the patient group;** Being aged 18-65 years, the ASAD diagnosis according to the DSM-5 criteria (American Psychiatric Association, 2013), no other comorbid mental disorders (except for anxiety and associated disorders and depressive disorder), no significant somatic pathology or any neurological disorders that would affect the distribution of existing psychiatric symptoms, no history of alcohol or substance abuse disorder in the last six months, providing a signed written informed consent form.

**Exclusion criteria for the patient group;** Not being aged 18-65 years, no ASAD diagnosis according to the DSM-5 criteria, other comorbid mental disorders (except for anxiety and associated disorders and depressive disorder), significant somatic pathology or any neurological disorders that would affect the distribution of existing psychiatric symptoms, history of alcohol or substance abuse disorder in the last six months, not providing a signed written informed consent form

### Statistical Analysis

We analyzed the data using SPSS 22.0 (Statistical Package for Social Sciences; SPSS Inc., Chicago, IL). While categorical data were shown as numbers (n) and percentages (%), we presented continuous data as mean  $\pm$  standard deviation ( $M \pm SD$ ), median-interquartile range (25th-75th percentiles). We performed a Chi-square test (Pearson's Chi-square) to compare the categorical variables between the groups. Then, we ran the Kolmogorov-

Smirnov test to check whether the continuous data showed a normal distribution. Since the data did not normally distribute, while performing a Mann-Whitney U-test to compare the groups, we used Spearman's correlation test to examine the relationships between the variables. Finally, Multiple Linear Regression analysis was utilized to determine whether adult separation anxiety significantly predicts nomophobia. While creating the model, those with significant correlations in correlation tests were included in the model. In all analyses, we accepted a p-value  $< 0.05$  as statistically significant.

### Data collection tools

*Sociodemographic Information Form:* We generated the form to obtain participants' age, sex, height-weight, employment status, marital status, educational attainment, occupation, place of residence, income level, psychiatric treatment status, family history of psychiatric disorders, and physical health status.

*Adult Separation Anxiety Questionnaire (ASA-27):* Manicavasagar et al. (14) developed the 27-item four-point Likert-type scale (0= This has never happened; 3= This happens very often) to measure the symptoms of separation anxiety appearing not only in childhood but also early adulthood. The scale was previously adapted to Turkish (15). The higher total score on the scale indicates intensified adult separation anxiety. The Turkish adaptation study revealed the cut-off point as 25 and above (22 in the original study) and calculated the internal consistency coefficient of the scale to be .93 (15).

*Nomophobia Questionnaire (NMP-Q):* It was developed by Yildirim and Correia (16) to measure smartphone addiction among individuals. The 7-point Likert-type scale consists of 20 items within four subscales: not being able to communicate, losing connectedness, not being able to access information, and giving up convenience. Total score indicates the severity of nomophobia: none (NMP-Q Score = 20), mild ( $21 \leq$  NMP-Q Score  $< 60$ ), moderate ( $60 \leq$  NMP-Q Score  $< 100$ ), and extreme ( $100 \leq$  NMP-Q Score  $\leq 140$ ). Yildirim et al. (17) carried out its Turkish validity and reliability study and calculated Cronbach's alpha coefficient

cient to be .94.

**Beck Anxiety Inventory (BAI):** The 4-point Likert-type inventory was developed by Beck. It consists of 21 items, and the total score ranges from 0 to 63. The high total score refers to one's high level of anxiety. Ulusoy et al. (18) adapted the tool into Turkish and found Cronbach's alpha coefficient to be 0.93.

**Beck Depression Inventory (BDI):** Developed by Beck, the inventory is a four-point Likert-type scale consisting of 21 items. The total score varies between 0-63. Hisli (19) carried out its Turkish validity and reliability study and calculated Cronbach's alpha coefficient to be 0.74 (19).

## RESULTS

We carried out the study with a total of 100 participants, 50 patients and 50 controls. While the median age of the patient group was 29.5 (24.0 - 35.0), it was 28.0 (25.0 - 33.0) in the control group. There was no significant difference between the groups by age ( $p=0.355$ ). Moreover, 76% and 78% of the groups were females, respectively, and we did not find a significant difference between the groups by sex ( $p=0.812$ ). Besides, there were no significant differences between the groups by marital status ( $p=0.410$ ), educational attainment ( $p=0.891$ ), place of residence ( $p=0.673$ ), income level ( $p=0.592$ ), employment status ( $p=0.687$ ), organic disease ( $p=1,000$ ), and medication

( $p=0.779$ ) (Table 1).

The incidence of comorbid psychiatric disorders (generalized anxiety disorder, panic disorder, agoraphobia, specific phobia, social phobia, depressive disorder) in the patient group (42%) was found to be significantly higher than that in the control group (0%) ( $p<0.001$ ). Furthermore, we discovered that the patient group (46%) had a more prevalent history of psychiatric treatment than the control group (22%) ( $p=0.011$ ). Similarly, the patient group significantly used alcohol/substance (20%) significantly more than the patient group (0%) ( $p=0.001$ ). It was found that having married parents was significantly more common in the control group (78%) than in the patient group (32%) ( $p<0.001$ ). Likewise, the rate of those living with their parents in the patient group (22%) was significantly lower than that in the control group (44%) ( $p=0.014$ ). About one-fourth (24%) of the patients used their smartphones at home, 12% in outdoor spaces, 10% at work, and 54% in multiple places (home-work-outdoor), whereas 20% of those in the control group used them at home, 54% in outdoor spaces, and 26% at work. Accordingly, the groups significantly differed by where they spent the most time with their smartphones ( $p<0.001$ ). The results also revealed that the patient group had significantly more daily smartphone usage time than the control group ( $p<0.001$ ).

Yet, the groups did not significantly differ by family history of psychiatric disorders ( $p=0.061$ ), smoking ( $p=0.529$ ), and duration of smartphone ownership

**Table 1.** Sociodemographic characteristics of the patient and control groups

	Patient group		Control group		P*	
	n	%	n	%		
Age, median (IQR)	29.5 (24.0-35.0)		28.0 (25.0-33.0)		0.355**	
Sex	Female	38	76.0	39	78.0	0.812
	Male	12	24.0	11	22.0	
Marital status	Single	22	44.0	25	50.0	0.410
	Married	18	36.0	12	24.0	
	Widowed/Divorced	10	20.0	13	26.0	
Educational attainment	Middle school and below	15	30.0	15	30.0	0.891
	High school	17	34.0	15	30.0	
	University	18	36.0	20	40.0	
Place of residence	District	18	36.0	16	32.0	0.673
	City	32	64.0	34	68.0	
Income level	Low	10	20.0	14	28.0	0.592
	Middle	23	46.0	19	38.0	
	High	17	34.0	17	34.0	
Employment status	Employed	27	54.0	29	58.0	0.687
	Unemployed	23	46.0	21	42.0	

\*Chi-square analysis, \*\*Mann Whitney-U test.

IQR: Inter Quantile Range

**Table 2.** Comparison of disease characteristics of groups

		Patient group		Control group		p*
		n	%	n	%	
Organic disease	Yes	9	18.0	9	18.0	1.000
	No	41	82.0	41	82.0	
Medication	Yes	8	16.0	7	14.0	0.779
	No	42	84.0	43	86.0	
Comorbid psychiatric disorder	Yes	21	42.0	0	.0	<0.001
	No	29	58.0	50	100.0	
History of psychiatric treatment	Yes	23	46.0	11	22.0	0.011
	No	27	54.0	39	78.0	
Family history of psychiatric disorders	Yes	16	32.0	8	16.0	0.061
	No	34	68.0	42	84.0	
Smoking	Yes	16	32.0	19	38.0	0.529
	No	34	68.0	31	62.0	
Alcohol/substance use	Yes	10	20.0	0	.0	0.001
	No	40	80.0	50	100.0	
Parental relationship	Married	16	32.0	39	78.0	<0.001
	Officially divorced	12	24.0	0	.0	
	Mother deceased	11	22.0	6	12.0	
	Father deceased	11	22.0	5	10.0	
Cohabitant	Parents	11	22.0	22	44.0	0.014
	Mother or father	4	8.0	0	.0	
	Alone	19	38.0	18	36.0	
	Spouse	12	24.0	10	20.0	
	Other	4	8.0	0	.0	

\*Chi-square analysis

(p=1.000) (Table 2,3).

While more than half of the patients (54%) exhibited moderate nomophobia, 46% showed mild nomophobia.

The results revealed that, compared to healthy controls, the patients had significantly higher scores on the ASA-27, the BDI, the BAI, the NMP-Q (total), the NMP-Q not being able to access information, the NMP-Q giving up convenience, the NMP-Q not being able to communicate, and the NMP-Q losing connectedness (p=0.006 for the NMP-Q not being able to access information; p<0.001 for others) (Table 3).

There were significant positive correlations between daily smartphone usage time and the participants' anxiety, depression, and nomophobia total and subscale scores (except for losing connectedness) (Table 4).

The results yielded significant positive relation-

**Table 3.** Comparison of smartphone-related features of groups

		Patient group		Control group		p*
		n	%	n	%	
Duration of smartphone ownership	Less than 5 years	3	6.0	3	6.0	1.000
	More than 5 years	47	94.0	47	94.0	
Place where the most time spent with the smartphone	Home	12	24.0	10	20.0	<0.001
	Outdoor space	6	12.0	27	54.0	
	Workplace	5	10.0	13	26.0	
	Multiple spaces	27	54.0	0	.0	
Daily smartphone usage time		5.5 (5-7)		3 (2-4)		<0.001**

\*Chi-square analysis. \*\*Mann Whitney-U test.

IQR: Inter Quantile Range

ships between adult separation anxiety disorder and the participants' depression, anxiety, and nomophobia total and subscale scores (except for losing connectedness). We also found that participants' depression scores showed significant positive correlations with their anxiety and nomophobia total and subscale scores (except for losing connectedness). Finally, the participants' anxiety scores had significant positive relationships with their nomophobia total and subscale scores (except for losing connectedness) (Table 5).

Considering nomophobia by smartphone ownership, we could not find a significant difference between the patients owning a smartphone for more than five years and those using a smartphone for less than five years (p=0.970).

The results of the multiple regression analysis suggested that participants' scores on the ASA-27 significantly predicted their scores on the NMP-Q (total) ( $\beta=0.648$ , p<0.001), the NMP-Q not being able to access information ( $\beta=0.070$ , p=0.034), the NMP-Q giving up convenience ( $\beta=0.071$ ,

**Table 4.** Participants scores on the scales

	Patient group	Control group	p
	Median (IQR)	Median (IQR)	
ASA-27	42.0 (28.0-49.0)	3.0 (2.0-8.0)	<0.001
BDI	10.0 (6.0-15.0)	2.0 (.0-3.0)	<0.001
BAI	15.5 (10.0-25.0)	2.0 (.0-3.0)	<0.001
NMP-Q not being able to access information	10.0 (8.0-12.0)	7.0 (6.0-9.0)	<0.001
NMP-Q giving up convenience	9.5 (8.0-13.0)	8.0 (7.0-10.0)	0.006
NMP-Q not being able to communicate	30.5 (14.0-36.0)	8.0 (7.0-9.0)	<0.001
NMP-Q losing connectedness	11.0 (7.0-14.0)	7.0 (6.0-8.0)	<0.001
NMP-Q total	62.0 (41.0-72.0)	31.0 (28.0-34.0)	<0.001

\*Mann Whitney-U

ASA-27: Adult Separation Anxiety Questionnaire, NMP-Q: Nomophobia Questionnaire, BDI: Beck Depression Inventory, BAI: Beck Anxiety Inventory

p=0.047), and the NMP-Q not being able to communicate ( $\beta=0.451$ ,  $p<0.001$ ). In addition, the scores on the BAI were found to significantly predict the scores on the NMP-Q not being able to access information ( $\beta=0.120$ ,  $p=0.042$ ). Overall, we concluded that the variables discussed as the predictors of nomophobia explained about 50.7% of the patients' nomophobia levels (Table 6).

## DISCUSSION

The most noteworthy result of our study was that patients with ASAD exhibited significantly more nomophobic behavior compared to healthy controls. Accordingly, we may assert that patients do not want to lose online connection through their smartphones, avoid being away from communication, desire to access information at any time, and always prefer the convenience provided by their smartphones. The patients were found to have moderate nomophobia with a mean NMP-Q score of 62. Intensified separation anxiety symptoms lead patients to exhibit significantly increased

nomophobic tendency (except for losing connectedness).

What encouraged us to design such a study was the common ground in previous research on the etiology of ASAD and nomophobia. Hopefully, our findings supported our consideration that there may be a relationship between ASAD and nomophobia. We know that ASAD is also explained through attachment styles. Attachment, acquired in early childhood and maintained throughout life, affects one's interpersonal relationships and behavior. While it is well-documented that people with ASAD may have anxious or insecure attachment characteristics (5), the previous research reported that people with anxious attachment can easily develop smartphone or Internet addiction (10,11).

We did not examine the patients' attachment styles. Yet, in nomophobia, one clinically experiences excessive anxiety when separated from their smartphone, just as when an ASAD patient leaves their attachment figure. Similarly, as in ASAD where

**Table 5.** Correlations of the participants daily smartphone usage time and their scale scores

	Daily smartphone usage time	ASA-27	BDI	BAI	NMP-Q not being able to access information	NMP-Q giving up convenience	NMP-Q not being able to communicate	NMP-Q losing connectedness
ASA-27	r	.216						
	p	.132						
BDI	r	.540	.302					
	p	.000	.033					
BAI	r	.463	.298	.848				
	p	.001	.035	.000				
NMP-Q not being able to access information	r	.419	.438	.402	.424			
	p	.002	.001	.004	.002			
NMP-Q giving up convenience	r	.361	.338	.397	.404	.320		
	p	.010	.016	.004	.004	.023		
NMP-Q not being able to communicate	r	.616	.572	.519	.468	.622	.549	
	p	.000	.000	.000	.001	.000	.000	
NMP-Q losing connectedness	r	.199	.185	.173	.081	-.081	.228	.300
	p	.166	.198	.231	.576	.574	.111	.035
NMP-Q Total	r	.610	.589	.563	.508	.636	.673	.946
	p	.000	.000	.000	.000	.000	.000	.000

ASA-27: Adult Separation Anxiety Questionnaire, NMP-Q: Nomophobia Questionnaire, BDI: Beck Depression Inventory, BAI: Beck Anxiety Inventory

**Table 6.** The results of multiple regression analysis for factors associated with nomophobia

	Beta	SE	Standard Beta	t	p
<b>NMP-Q Total (R<sup>2</sup>=0.507)</b>					
ASA-27	0.648	0.162	0.461	4.007	<0.001
BDI	0.672	0.422	0.260	1.595	0.118
BAI	0.249	0.287	0.140	0.867	0.390
<b>NMP-Q not being able to access information (R<sup>2</sup>=0.315)</b>					
ASA-27	0.070	0.032	0.297	2.188	0.034
BDI	-0.014	0.084	-0.031	-1.63	0.871
BAI	0.120	0.057	0.398	2.095	0.042
<b>NMP-Q giving up convenience (R<sup>2</sup>=0.265)</b>					
ASA-27	0.071	0.035	0.287	2.043	0.047
BDI	0.084	0.090	0.185	0.932	0.356
BAI	0.049	0.061	0.156	0.793	0.432
<b>NMP-Q not being able to communicate (R<sup>2</sup>=0.468)</b>					
ASA-27	0.451	0.116	0.464	3.878	<0.000
BDI	0.385	0.303	0.215	1.271	0.210
BAI	0.180	0.206	0.146	0.870	0.389
<b>NMP-Q losing connectedness (R<sup>2</sup>=0.105)</b>					
ASA-27	0.056	0.051	0.172	1.112	0.272
BDI	0.217	0.132	0.361	1.648	0.106
BAI	-0.099	0.090	-0.239	-1.100	0.277

ASA-27: Adult Separation Anxiety Questionnaire, NMP-Q: Nomophobia Questionnaire, BDI: Beck Depression Inventory, BAI: Beck Anxiety Inventory, SE: standard error

one needs to control and reach their attachment figure and tries to keep it close all the time, a nomophobic person shows a phone proximity-seeking tendency toward their smartphone (12). In addition, one's emotional dependence on their attachment figures may predict their tendency to show more fear and anxiety when away from their smartphone (8). People may tend to use smartphones to fulfill their need for attachment, so they may consider their smartphones attachment objects. From this point of view, it may not be surprising that those with ASAD may show nomophobia more than ordinary people. In this study, more than half of the patients were found to be moderately nomophobic, which might be because, on the other hand, ASAD patients have a strong desire to access their attachment figures when feeling depressed or anxious and/or they see their smartphones as attachment figures. Since patients cannot communicate with their attachment figures and lose their online connection, they may demonstrate nomophobic behavior. An ASAD patient may tend to use their smartphones more when away from their attachment figures. Also, these individuals may experience anxiety when not noticing the notifications and calls on their phones. Being away from their smartphones may probably trigger some stereotypical thoughts of ASAD patients, like losing family, relatives and/or friends or being left alone in a bad situation. Although our findings support the above-mentioned views, we cannot understand the underlying mechanisms of such findings due to the case-control design of the present study.

We also recognize that our data are not comprehensive enough to evaluate nomophobia, which is still considered a phobia, on the basis of separation anxiety.

Another remarkable finding of our study was that separation anxiety significantly predicted nomophobia. Therefore, we may confidently postulate that ASAD patients' anxiety and stress are predictive of nomophobia development in smartphone deprivation. Similarly, Han et al. (20) reported that staying away from smartphones may trigger separation anxiety among today's people (20).

In our study, we found that 42% of the patients had comorbid psychiatric disorders (generalized anxiety disorder, panic disorder, agoraphobia, specific phobia, social phobia, and depressive disorder). Indeed, it was an expected finding considering the high rates of psychiatric comorbidities, especially anxiety and depressive disorders, in ASAD (3). In addition, while the patients exhibited mild depressive and anxiety symptoms, they had moderate separation anxiety symptoms with a mean score of 42 (cut-off point = 25). A study in 2017 reported a link between smartphone addiction and ASAD, moderated by depression (13). This finding seems to overlap previous research suggesting that smartphone addiction and depression coexist (21). Similarly, it was found that insecurely attached students choose their smartphones as self-objects to alleviate their depressive feelings (22). The author stated that the

smartphone is an alternative to one's insecure attachment. While evaluating our findings, it would be better to consider comorbidities among the patients.

In this study, we could not find a significant association between the duration of smartphone ownership (more/less than five years) and nomophobia. In a study, the participants using a smartphone for more than two years had a significantly higher mean nomophobia score than those having a smartphone for less than two years (17). Another study showed such a difference between those using a smartphone for more than five years and people owning a smartphone for less than a year (23). Considering the relationship between nomophobia and time spent with a smartphone in a day, it was previously found that the students using their smartphones for more than five hours a day showed more nomophobic behavior than their peers spending less than three hours with their devices (24). Another study revealed that an increased duration of smartphone use may elevate one's nomophobia (16). In line with previous findings, we concluded that the severity of nomophobia increased among our patients as they spent more time with their smartphones. In addition, the patient group had significantly more daily smartphone usage time than the control group.

The major strength of our study is that we explored nomophobia among ASAD patients, a group that can often be overlooked. It is also the first study to report nomophobia levels in patients diagnosed with ASAD.

Regarding limitations, we did not examine the attachment styles of the sample, which should be kept in mind when evaluating our results. In addition, our patients had comorbid psychiatric diseases with a rate of 42%. Finally, it may not be appropriate to generalize the finding since we designed the present research as a case-control study.

To the best of our knowledge, our study is the first to report nomophobia levels among patients diagnosed with ASAD. While more than half of the patients (54%) exhibited moderate nomophobia,

46% showed mild nomophobia. The increased severity of separation anxiety symptoms contributed to the severity of nomophobia among the patients, which, in turn, significantly boosted the severity of their depression and anxiety. Moreover, the patients' separation anxiety predicted their nomophobia, except for losing connectedness. Overall, our findings may shed light on interventions for patients with both ASAD and nomophobia. Besides, the results emphasize that smartphone use needs to be further investigated among ASAD patients. Perhaps, further experimental and longitudinal research may include nomophobia therapy in a psychoeducational program for ASAD patients. Although nomophobia is a subject that has attracted research attention in recent years, the literature still hosts limited research on it. We think that our findings may open room for further and comprehensive research on this subject.

**Ethical Considerations:** The Ethics Committee of Firat University for Non-Interventional Research granted the relevant approval to our study (Date: 11/04/2021, No: 2021/11-15). We carried out all procedures in the study in accordance with the Declaration of Helsinki. All patients provided written informed consent after adequate information on the purpose of the study was given.

**Acknowledgments:** None.

**Conflict of interest:** None to declare.

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## REFERENCES

1. American Psychiatric Association. Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA, American Psychiatric Publishing, 2013.
2. Silove D, Alonso J, Bromet E, Gruber M, Sampson N, Scott K, Andrade L, Benjet C, de Almeida JMC, de Girolamo G, de Jonge P, Demyttenaere K, Fiestas F, Florescu S, Gureje O, He Y, Karam E, Lepine JP, Murphy S, Villa-Posada J, Zarkov Z, Kessler RC. Pediatric-onset and adult-onset separation anxiety disorder across countries in the world mental health survey. *Am J Psychiatry* 2015; 172:647–656.
3. Shear K, Jin R, Ruscio AM, Walters EE, Kessler RC. Prevalence and correlates of estimated DSM-IV child and adult separation anxiety disorder in the National Comorbidity Survey Replication. *Am J Psychiatry* 2006; 163:1074-1083.
4. Bögels SM, Knappe S, Clark LA. Adult separation anxiety disorder in DSM-5. *Clin Psychol Rev* 2013; 33:663-674.
5. Manicavasagar V. Adult attachment styles in panic disorder with and without comorbid adult separation anxiety disorder. *Aust NZJ Psychiatry* 2009; 43:167-172.
6. Sivadas E, Machleit KA. A scale to determine the extent of object incorporation in the extended self. *Marketing Theory and Applications* 1994; 5:143–149.
7. Elhai JD, Dvorak RD, Levine JC, Hall BJ. Problematic smartphone use: A conceptual overview and systematic review of relations with anxiety and depression psychopathology. *J Affect Disord* 2017; 207:251-259.
8. Arpacı I, Baloğlu M, Özteke Kozan Hİ, Kesici Ş. Individual differences in the relationship between attachment and nomophobia among college students: the mediating role of mindfulness. *J Med Internet Res* 2017; 19:e404.
9. Kim E, Koh E. Avoidant attachment and smartphone addiction in college students: The mediating effects of anxiety and self-esteem. *Comput Human Behav* 2018; 84:264–271.
10. Oldmeadow JA, Quinn S, Kowert R. Attachment style, social skills, and Facebook use amongst adults. *Comput Human Behav* 2013; 29:1142-1149.
11. Hart J, Nailling E, Bizer GY, Collins CK. Attachment theory as a framework for explaining engagement with Facebook. *Pers Individ Dif* 2015; 77:33-40.
12. Konok V, Gigler D, Bereczky BM, Miklósi Á. Humans' attachment to their mobile phones and its relationship with interpersonal attachment style. *Comput Human Behav* 2016; 61:537–547.
13. Kim E, Cho I, Kim EJ. Structural equation model of smartphone addiction based on adult attachment theory: Mediating effects of loneliness and depression. *Asian Nurs Res* 2017; 11:92-97.
14. Manicavasagar V, Silove D, Wagner R, Drobny J. A self-report questionnaire for measuring separation anxiety in adulthood. *Compr Psychiatry* 2003; 44:146-153.
15. Dirioz M, Alkın T, Yemez B, Onur E, Eminağaoğlu N. Ayrılma anksiyetesi belirti envanteri ile yetişkin ayrılma anksiyetesi anketinin Türkçe versiyonunun geçerlilik ve güvenilirliği. *Türk Psikiyatri Dergisi* 2011; 22: 108-106.
16. Yıldırım C, Correia AP. Exploring the dimensions of nomophobia: Development and validation of a self-reported questionnaire. *Comput Human Behav* 2015; 49:130-137.
17. Yıldırım C, Sumuer E, Adnan M, Yıldırım S. A growing fear: Prevalence of nomophobia among Turkish college students. *Information Development* 2016; 32:1322-1331.
18. Ulusoy M, Sahin NH, Erkmen H. Turkish version of the Beck anxiety inventory: psychometric Properties. *J Cogn Psychother Int Q* 1998; 12:163-172.
19. Hisli N. Beck depresyon envanterinin üniversite öğrencileri için geçerliği, güvenilirliği. *Psikoloji Dergisi* 1989 ;7:3-13.
20. Han S, Kim KJ, Kim JH. Understanding nomophobia: structural equation modeling and semantic network analysis of smartphone separation anxiety. *Cyberpsychol Behav Soc Netw* 2017; 20:419-427.
21. Yen JY, Yen CF, Chen CS, Wang PW, Chang YH, Ko CH. Social anxiety in online and real-life interaction and their associated factors. *Cyberpsychol Behav Soc Netw* 2012; 15:7-12.
22. Flores PJ. Addiction as an attachment disorder. Lanham, Jason Aronson, 2004.
23. Gezgin DM, Şahin YL, Yıldırım S. Sosyal ağ kullanıcıları arasında nomofobi yaygınlığının çeşitli faktörler açısından incelenmesi. *ETKU* 2017; 7:1-15.
24. Kalaskar PB. A study of awareness of development of NoMoPhobia condition in smartphone user management students in Pune city. *ASM's International E-Journal on Ongoing Research in Management and IT* 2015;10: 320-326.