

Experiential Avoidance as a Mediator of the Relationship between Dispositional Mindfulness and Problematic Smartphone Use

Abstract

Background: Experiential avoidance (EA) and mindfulness are the two important transdiagnostic process and outcome variables in psychological formulation and treatment. While smartphones have a large utility value, they also have the potential for adverse impacts on functioning. Studies have separately shown associations among EA, dispositional mindfulness (DM), and problematic smartphone use (PSU). However, there is a lack of study exploring the associations and mediation relationship among these variables together in an Indian context. The current study aims to explore the associations of PSU, DM, EA, and sociodemographic factors; including the mediating effect of EA between DM and PSU in the Indian adult context. **Methods:** Four hundred and thirty-four participants (M age = 25.4, standard deviation = 2.6, 58.8% females) were recruited for an online survey using a cross-sectional design. Data were collected using sociodemographic questionnaire, Smartphone Addiction Scale-Short Version, brief EA scale, and Mindfulness Attention Awareness Scale. Statistical analyses comprised multiple regression, mediation analysis, and significance in sociodemographic variables. **Results:** Both EA and DM significantly predicted PSU with a 37% variance; however, DM had an inverse relationship. EA as a mediator could account for a quarter of the effect, $P_M = 24.4\%$, $ab = -0.14$, 95% $CI^s (-0.19, -0.09)$. **Conclusion:** The current study implicates the monitoring and treatment planning for PSU from a transdiagnostic perspective in the Indian context.

Keywords: *Dispositional mindfulness, experiential avoidance, problematic smartphone use*

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Introduction

Addictions, either substance or behavioral, have been found to have associations with several psychological factors such as anxiety, avoidance, sensation seeking, and trauma.^[1] Loss of control has shown to be a salient feature in excessive smartphone use and it is interesting to investigate its relationship with mindfulness, which involves control strategies toward attention and awareness.^[2] These interventions integrate the essence of traditional mindfulness practices with contemporary psychological practice, to improve psychological functioning and well-being. The two most extensively used interventions are mindfulness-based stress reduction^[3] and mindfulness-based cognitive therapy,^[4] both of which teach mindfulness skills through a range of formal and informal mindfulness practices, including mindfulness of breath, thoughts, bodily sensations, sounds, and everyday activities.

Also implicated in mindfulness and addiction, is the concept of experiential avoidance (EA). It has been defined as an unwillingness to remain in contact with distressing emotions, thoughts, memories, and physical sensations, even when doing so creates harm in the long run.^[5] It is a functional process that has been linked to a wide range of psychopathology, including depression, anxiety, and externalizing disorders.^[6] Many seemingly unrelated manifestations of psychopathology (e.g., emotional distancing, isolation, compulsive rituals, bingeing and purging, substance abuse, self-harm, and suicide) can be seen to share a common function of attempting to avoid distress in the short run. EA has been shown to have a positive relationship with addictive behaviors such that an individual turns to excessive use of a substance or object to avoid ongoing distressing thoughts and feelings. A researcher found

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that mindful attention and awareness had a negative correlation with smartphone vigilance and problematic smartphone use (PSU), and mindful describing had a negative correlation with smartphone vigilance and PSU.^[7]

Concerning mindfulness, EA is associated inversely with mindfulness. EA has also been positively associated with anxiety, therefore, given that EA is thought to be involved in the development and maintenance of several psychological disorders, interventions involving mindfulness training may have promising broad mental health benefits.^[8] It has been seen that individuals experiencing emotional distress and/or anxious arousal may over engage in the use of technology to relieve emotional distress as a safety behavior. They examined PSU as a moderator of the relationship between EA and anxiety in 294 adult participants and indicated that the relationship between EA and anxiety became significantly stronger as PSU increased.^[9] Another researcher examined the mediating effects of EA on the relationships between life stress, depression, and smartphone addiction in 283 nursing college students from South Korea. They found significant positive correlations between life stress, depression, smartphone addiction, and EA. EA partially mediated the relationship between life stress and smartphone addiction.^[10] In another study, procrastination and distress aversion factors of EA mediated the relationship between stress and internet/smartphone addiction in 448 middle school students.^[11] In terms of mindfulness-based interventions for excessive smartphone use, it was proposed that adolescents improved on resilience and had lower smartphone addiction scores after joining a group mindfulness-based 12-week/90-min program.^[12] Similarly, another study investigated the effectiveness of an 8-week group mindfulness-based cognitive-behavioral intervention on smartphone addiction in 41 Chinese university students. They found that smartphone use time and addiction scores significantly decreased in the intervention group compared with the control group.^[13] In a review, it was observed that smartphone addiction has adverse structural and functional effects on the brain, and meditation and mindfulness were shown to enhance the structure and function of the same areas of the brain.^[14] Hence, meditation could be an effective tool to reverse smartphone addiction.

EA has been implicated in several psychological disorders including addictive behaviors. The role of dispositional mindfulness (DM), with its focus on bringing control and acceptance toward various experiences, is used to reduce addictive behaviors. Therefore, the current study aims to explore the association of PSU with DM and EA.

Methods

Study participants

A total of 434 participants expressed a willingness to participate in the web-based survey. In this online

survey, the participant's age range was 18–30 years, with 25.4 ± 2.6 (mean age \pm standard deviation [SD]) years. The web-based questionnaire to assess PSU, EA, and DM was distributed on Facebook, WhatsApp, and other platforms to obtain the most heterogeneous sample possible. The survey period lasted for 10 weeks. Participants gave their informed consent by checking the acceptance (yes) of the question for participating in the study and allowing the researcher to use the data for research purposes. Exclusion criteria were those who were out of the age range for the study or had psychiatric diagnoses in the past year. The study was not CTSI registered. This study was approved by the Institute Ethics Committee (NIMH/DO/BEH. Sc. Div./2021–22// dated November 9, 2021).

Tools

Demographic questionnaire

Self-reported demographic variables included age, gender, city, education, marital status, family setup, work status, religion, nationality, city, state, and if any psychiatric diagnosis.

Smartphone addiction scale-short version

Smartphone addiction scale-short version (SAS-SV)^[15] consisted of 10 items rated on a 6-point Likert scale ranging from “strongly disagree” to “strongly agree.” Example items include, “Using my smartphone longer than I had intended,” and “Having my smartphone in my mind even when I am not using it.” The full version of the scale had the following factors: daily-life disturbance, positive anticipation, withdrawal, cyberspace-oriented relationship, overuse, and tolerance. However, the short version is a unidimensional scale. The scores range from 10 to 60, with higher scores indicating higher smartphone addiction. The internal consistency was found to be 0.91 and the concurrent validity was established adequately.

Brief experiential avoidance questionnaire

The Brief EA Questionnaire (BEAQ)^[16] is a unidimensional scale that assesses EA. It consisted of 15 items rated on a 6-point Likert scale ranging from “strongly disagree” to “strongly agree.” Sample items include, “I’m quick to leave any situation that makes me feel uneasy,” and “I go out of my way to avoid uncomfortable situations.” The scores range from 15 to 90. After correcting for reverse-scored items, higher scores indicate greater EA. This scale was preferred rather than the Acceptance and Action Questionnaire (AAQ) owing to its good criterion validity and lack of conflicting constructs such as neuroticism which are present in the AAQ. The BEAQ was created using items from each of the Multidimensional EA Questionnaire’s (MEAQ) six dimensions. The items were selected based on their performance in three samples: undergraduates ($n = 363$), psychiatric outpatients ($n = 265$), and community adults ($n = 215$). These items were then

evaluated using two additional samples (314 undergraduates and 201 psychiatric outpatients) and cross-validated in two new independent samples (283 undergraduates and 295 community adults). The resulting measure exhibited strong convergence for each of the MEAQ’s six dimensions. The BEAQ demonstrated expected associations with measures of avoidance, psychopathology, and quality of life and was distinguishable from negative affectivity and neuroticism.^[16]

Mindfulness Attention Awareness Scale

The mindfulness attention awareness scale (MAAS)^[17] is a unidimensional scale used to assess DM. It consisted of 15 items rated on a 6-point Likert scale ranging from “Almost always” to “Always never.” Example items include: “*It seems I am running on automatic without much awareness of what I’m doing,*” and “*I tend not to notice feelings of physical tension or discomfort until they really grab my attention.*” The scores range from 15 to 90. After correcting for reverse-scored items, lower scores indicate greater DM.

Procedure

Data were collected through a Google Forms survey. Invitations by WhatsApp and Facebook messengers were sent out to all the participants. Consent was taken from the participants at the time of filling out the form. The item for consent was: “*I understand that my participation is completely voluntary. I will need to provide my contact information so that I can be sent the future survey to answer, however, my contact information will not be passed to any third parties and will be removed from my answers before any analysis takes place. The data gathered in the study will be stored securely and it will not be possible to identify me.*” Confidentiality and anonymity about the survey responses were assured for all the participants.

Statistical analysis

Descriptive statistical analyses were conducted for all the nominal and ordinal data. Cronbach’s alpha was used to calculate the internal consistencies. Multiple regression analysis was used to find the significant predictors of PSU. PSU was taken as a dependent variable with EA and DM as predictors or independent variables. Mediation analysis was used to calculate the mediating effect of EA between DM and PSU. Pearson’s correlations, one-way analysis of variance, Tukey’s honestly significant difference, and Kruskal–Wallis H test were used to explore sociodemographic associations among the variables.

Results

Sociodemographic findings are presented in Table 1. The current study consisted of data collected from 434 participants (58.8% females) with a mean age of 25.4 years (SD = 2.6). About 87.1% of the participants were unmarried. Most of the participants had completed their postgraduation and above (64.7%), followed by those with an undergraduate degree (28.8%), and 12th standard (6.5%).

Table 1: The sociodemographic and scale scores of the sample

Sociodemographic profile and scale scores	
	n (%) / mean ± SD
Gender	
Male	179 (41.20)
Female	255 (58.80)
Age (range)	25.4 ± 2.6 (18–30)
Male’s	25.7 ± 2.8
Female’s	25.3 ± 2.5
Marital status	
Single	378 (87.10)
Married	56 (12.90)
Education	434 (100)
12 th standard	28 (6.50)
Undergraduate	125 (28.80)
Postgraduate	281 (64.70)
Employment	
Students	183 (42.20)
Working	251 (57.80)
Family status	
Joint family	69 (15.90)
Nuclear family	213 (49.10)
Living with friends	86 (19.80)
Single occupancy	66 (15.20)
Religious affiliation	
Hinduism	291 (67.10)
Christianity	78 (18)
Islam	25 (5.80)
Other	40 (9.1)
State (past year)	
Karnataka	150 (34.60)
Maharashtra	63 (14.50)
Madhya Pradesh	45 (10.40)
Other	176 (40.5)
SAS-SV (Likert: 1–6)	29.4 ± 10
Minimum	10
Maximum	60
Male	29.5 ± 9.9
Female	29.2 ± 10.2
BEAQ (Likert: 1–6)	48.5 ± 10
Minimum	15
Maximum	90
Male	50.9 ± 12
Female	46.9 ± 12.9
MAAS (Likert: 1–6)	60.3 ± 14.6
Minimum	15
Maximum	90
Male	58.8 ± 13.9
Female	61.4 ± 15

SAS-SV: Smartphone Addiction Scale-Short Version, BEAQ: Brief Experiential Avoidance Questionnaire, MAAS: Mindful Attention Awareness Scale

A majority were employed (57.8%) and the remaining were students. Around 49% lived in a nuclear family setup, followed by those living with friends (19.8%), joint family (15.9%),

and single occupancy (15.2%). Most of the participants were affiliated with the Hindu religion (67.1%). About 34.6% were living, for the most time in the past 1 year, in the state of Karnataka (34.6%), followed by Maharashtra (14.5%), Madhya Pradesh (10.4%), and the remaining in other states. There was neither a significant effect of gender $t(432) = 0.35, P = 0.73$ on PSU nor DM $t(432) = -1.9, P = 0.06$. However, the male participants ($M = 50.9, SD = 12$) had higher EA than female participants ($M = 46.9, SD = 12.9$), $t(432) = 3.2, P = 0.001, d = 0.32$. Age was found to have a negative correlation with SAS-SV ($r = -0.14, P < 0.01$) and BEAQ ($r = -0.15, P < 0.01$) and a positive correlation with MAAS ($r = 0.11, P < 0.05$). There were no significant effects on work status (students, working) and marital status (single, married) on PSU, EA, and DM. For PSU, the effect of education was significant, $F = 11.1, P < 0.001$, such that, those educated up to the 12th standard ($M = 32.7, SD = 10.1$) and under graduation ($M = 32.3, SD = 10.4$) had significantly higher scores than those with postgraduation and above ($M = 27.7, SD = 9.6$) with a small effect size, $\eta^2 = 0.05$. Similarly, for EA, the effect of education was significant, $F = 24, P < 0.001$, such that, those educated up to the 12th standard ($M = 55, SD = 11.3$) and under graduation ($M = 54, SD = 11.9$) had significantly higher scores than those with postgraduation and above ($M = 45.6, SD = 12.2$) with a medium effect size, $\eta^2 = 0.1$. Inversely, for DM, the effect of education was significant, $F = 11.8, P < 0.001$, such that, those educated up to the 12th standard ($M = 57.3, SD = 14.8$) and under graduation ($M = 55.5, SD = 15$) had significantly lower scores than those with postgraduation and above ($M = 62.7, SD = 13.8$) with a small effect size, $\eta^2 = 0.05$.

PSU in those living in a nuclear family ($M = 30.5, SD = 10.4$) was significantly higher than those living with friends ($M = 26.6, SD = 9.7$), having a small effect size, $\eta^2 = 0.02, P = 0.01$. EA in those living in a nuclear family ($M = 50.3, SD = 13.2$) and joint family ($M = 50.6, SD = 11.3$) was significantly higher than in those living with friends ($M = 44.8, SD = 12$), $P = 0.02$. Furthermore, EA in those living in a nuclear family ($M = 50.3, SD = 13.2$) was significantly higher than those living alone ($M = 45.7, SD = 11.7$), $P = 0.04$. There was no significant difference in DM between the different family setup groups, $\chi^2(3) = 0.54, P = 1$, with a mean rank MAAS score of 218.9 for joint, 216.2 for nuclear, 217.7 for with friends, and 219.8 for alone. For the current study, the internal consistency (Cronbach's alpha) was 0.85 for the SAS-SV, 0.85 for the BEAQ, and 0.90 for the MAAS. Pearson's correlations are shown in Table 2.

Table 2 shows that PSU had a moderate positive correlation with EA and a high negative correlation with DM. EA had a moderate inverse correlation with DM ($r = -0.48, P < 0.001$).

Multiple regression analysis was used to predict PSU from EA and DM. [Table 3] presents the unstandardized

Table 2: Correlation of age, Smartphone Addiction Scale, Brief Experiential Avoidance Questionnaire, and Mindful Attention Awareness Scale, total and gender-wise

	Age	SAS-SV	BEAQ	MAAS
Age	1			
Male	1			
Female	1			
SAS-SV	-0.14**	1		
Male	-0.13	1		
Female	-0.15*	1		
BEAQ	-0.15**	0.48***	1	
Male	-0.16*	0.48***	1	
Female	-0.17**	0.49***	1	
MAAS	0.11*	-0.55***	-0.48***	1
Male	0.08	-0.51***	-0.51***	1
Female	0.14*	-0.58***	-0.44***	1

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$. SAS-SV: Smartphone Addiction Scale-Short Version; BEAQ: Brief Experiential Avoidance Questionnaire, MAAS: Mindful Attention Awareness Scale

Table 3: Association of problematic smartphone use, experiential avoidance, and dispositional mindfulness

	B	95% CI for B		β
		LL	UL	
Constant	35.8	29.9	41.8	
Male	32	21.6	42.4	
Female	37.5	30.3	44.8	
EA	0.23	0.16	0.29	0.28***
Male	0.25	0.13	0.36	0.30***
Female	0.23	0.14	0.31	0.29***
DM	-0.29	-0.35	-0.23	-0.42***
Male	-0.26	-0.36	-0.15	-0.36***
Female	-0.31	-0.38	-0.24	-0.45***
R ²		0.37***		
Male		0.33***		
Female		0.40***		

*** $P < 0.001$. $n = 434$. CI: Confidence interval, LL: Lower limit, UL: Upper limit, EA: Experiential avoidance, DM: Dispositional mindfulness, PSU: Problematic smartphone use

estimates (B), 95% CI of B, and standardized estimates (β). Table 3 suggests that EA has a significant positive effect on PSU. However, DM has a significant negative effect both variables could account for 37% of the variance in PSU ($P < 0.001$).

There was a significant indirect effect of DM on PSU through EA, $ab = -0.14, 95\% \text{ CI}^{\text{es}} (-0.19, -0.09)$. EA as a mediator could account for roughly a quarter of the effect, $P_M = 24.4\%$. The path diagram of the mediation model is shown in Figure 1.

Discussion

The current study aimed to explore the various associations of PSU, EA, and DM in the Indian context. The internal

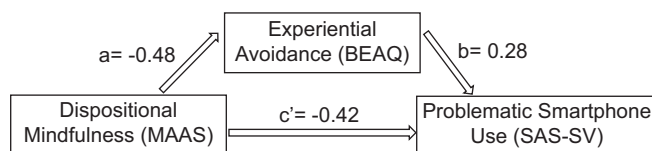


Figure 1: Path diagram of the mediating effect of experiential avoidance between dispositional mindfulness and problematic smartphone use

consistency of all the scales was found to be satisfactory. There was a moderate positive correlation of PSU with EA in the complete sample as well as based on gender. In addition, EA was also a significant predictor of PSU in the complete sample and based on gender, with a positive effect relationship. These findings are consistent with the study conducted on a sample of 1176 participants (828 women) with ages ranging from 16 to 82 ($M = 30.97$; $SD = 12.05$) using the SAS-SV and AAQ-II scales where the authors found that EA and social networks usage were found to be directly related to smartphone addiction.^[18] Another study inferred that smartphone use was positively related to EA as it was used as a strategy to avoid discomfort.^[19] DM was a significant predictor of PSU in the complete sample as well as based on gender. The relationship was found to be inverse, that is, higher DM predicted lesser PSU. These findings are in line with a previous study, which looked at the relationship between DM and attitudes, effects, and behaviors related to PSU.^[7] They found that mindful attention and awareness had a negative correlation with smartphone vigilance and PSU, and mindful describing had a negative correlation with smartphone vigilance and PSU. Similarly, another study also reported that the level of mindfulness among college students had a substantial direct predictive effect on their cell phone dependence and that mindfulness and social adaptation were significantly and adversely connected with cell phone dependence.^[20]

Studies have examined the mediating effects of smartphone use and mindfulness on various psychological variables. For example, a study examined the mediating role of smartphone addiction in the association between mindfulness/impulsivity and psychological distress among university students from five Turkish universities.^[21] Consistent with the current study, they found that mindfulness negatively predicted smartphone addiction. In addition, they also reported a positive mediating effect of smartphone addiction between psychological distress and mindfulness/impulsivity. A study also looked at how mindfulness affected the relationship between 660 Turkish participants' smartphone addiction and early maladaptive schemas. The results suggested that mindfulness dramatically reduced the amount of early maladaptive schemas associated with smartphone addiction.^[22]

The findings of the current study are also supported by the results of a study that explored the moderated relationship of mindfulness in a relationship between mobile phone addiction and depression and anxiety among 1258 Chinese

adolescents. They discovered that mindfulness mitigated the links between smartphone addiction and both anxiety and despair. The above findings lend strong support to the consistent negative associations between PSU and mindfulness across cultures and demographics.^[23]

There was a significant moderate inverse association between EA and DM among all the participants as well as based on gender. This finding was consistent with previous studies where they found a significant inverse relationship between EA and DM.^[8,24] In addition, there was a significant indirect effect of DM on PSU through EA. EA as a mediator could account for roughly a quarter of the effect (24.4%). While previous studies have explored EA as a mediator between various psychological factors and PSU, this study was unique in the exploration of the EA's mediating effect between DM and PSU. EA has been found to partially mediate the relationship between life stress and smartphone addiction.^[10] It has also been found to be a partial mediator between anxious attachment and smartphone addiction with implications for mental health professionals to assess the client's attachment style and help them in the reduction of smartphone addiction by helping them experience a secure relationship and explore the dysfunctional aspect of EA.^[25]

Technology is being used excessively to manage emotional distress among people who are nervous or experiencing emotional distress. In 294 adult participants, they looked at PSU as a mediator of the connection between EA and anxiety. Their research showed that when the PSU increased, the association between EA and anxiety became noticeably greater, indicating that it may enhance the impact of EA on anxiety.^[9] In terms of the implications, Yu and Son examined the results of eight sessions of acceptance and commitment therapy (ACT) on anxiety, self-control, and smartphone addiction among college students. The findings revealed that the ACT group's anxiety and smartphone addiction levels had decreased and remained stable through the follow-up.^[26]

EA was found to be lower in those with a higher age. On the contrary, DM was found to be higher in those with higher ages. This finding is consistent with the available research findings which explored the age-related differences in EA, and mindfulness among young adult students (M age = 20.1 years) and community-dwelling older adults (M age = 71.8 years).^[24] The younger adults reported higher EA and the older adults reported higher trait mindfulness. There were no significant DM score differences based on gender. This finding is in line with the previous studies done on comparative samples.^[27,28]

A higher EA was found in those having only basic education (according to the Indian education norms). No studies have previously explored the factor of education level in EA. The current authors propose that the competitiveness and challenges while achieving

higher education may provide the participant with more tools to regulate distress and continue with goals despite adversities. EA was significantly higher in those who lived with their families (joint or nuclear) than those who lived with friends or alone. Higher scores could be explained based on the cultural restrictions of the acceptance and experience of distress, limiting the participants to be free to experience and share their distress with near ones as compared with those staying away from family, who had more liberty to share and experience unpleasant events, thoughts, memories, and work through them.

Our findings shed light on both theoretical studies about the underlying process, i.e., mindfulness and EA in PSU and the ramifications for PSU intervention. By modifying transdiagnostic factors, the findings will help to lower the rate of PSU and contribute to planning successful psychological interventions. The several limitations noted below should be taken into consideration when interpreting the results of this study. The distribution was biased in favor of a few states and English-speaking Indian residents. EA and DM could only account for about 37% of the PSU ratings' diversity, leaving 63% unaccounted for. Future longitudinal research or experimental methods can be used to validate or make changes to our mediation model of PSU. The self-reported questionnaires used to collect all of the data for this study were subjective, subject to the social desirability effect and may have influenced the reliability or accuracy of participant's answers. Future studies can explore the relationships between the child and adolescent population. These findings may aid the development of successful smartphone addiction prevention programs.

Conclusion

The present study explored the relationship between EA, DM, PSU, and sociodemographic factors pertaining to the Indian adult context. It revealed the significance of EA as a mediating variable in the relationship between DM and PSU. In addition, various important sociodemographic variables pertaining to the Indian setup emerged as significantly associated with the study variables. The study holds importance in the monitoring and treatment planning for PSU using the studied relationships of transdiagnostic variables of EA and DM for the adult Indian.

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Conflicts of interest

There are no conflicts of interest.

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