

WHAT MAKES US MORE EMOTIONALLY VULNERABLE? EMOTIONAL, BEHAVIORAL, AND PHYSICAL PREDICTORS OF ADULTS' PSYCHOLOGICAL DISTRESS

ANDREEA-BIANCA POPA* & ALEXANDRA MAFTEI

Faculty of Psychology and Educational Sciences, *Alexandru Ioan Cuza* University, Iași

Abstract

A multilevel approach to studying psychological distress is essential to better understand the interaction between psychological and contextual factors and to identify the early signs of psychological distress. The present cross-sectional study used a multi-dimensional perspective to examine adults' psychological distress. We were interested in exploring the roles of emotional (i.e., rejection sensitivity), behavioral (i.e., smartphone addiction), and physical (i.e., sleep quality) predictors of psychological distress among adults. Our sample comprised 236 Romanian adults aged 18 to 58 ($M = 24.58$, $SD = 7.10$, 82.2% females). Inclusion criteria were related to age (> 18) and the use of a smartphone. Participants completed a web-based survey at the beginning of 2023. Correlation analyses suggested that high smartphone addiction, low sleep quality, and high rejection sensitivity were significantly associated with high psychological distress. Age was not significantly associated with psychological distress, and no significant gender-based differences were found in this regard. Multiple hierarchical regression analysis results suggested that psychological distress was best predicted by sleep quality and rejection sensitivity. Smartphone addiction was not a significant predictor in the proposed models. We discuss the present findings concerning their practical implications regarding the potential interventions to reduce adults' psychological distress.

Cuvinte-cheie: sensibilitatea la respingere, dependența de smartphone, calitatea somnului, distresul psihologic.

Keywords: rejection sensitivity, smartphone addiction, sleep quality, psychological distress.

*Alexandru Ioan Cuza University, Faculty of Psychology and Educational Sciences, Department of Psychology, Toma Cozma, no. 3, Iași, Romania, E-mail: popabianca2001@gmail.com

1. INTRODUCTION

Psychological distress encompasses a wide range of characteristics, from specific symptoms of depression and anxiety to personality traits and behavioral disorders (Drapeau *et al.*, 2011).

Anxiety and depression are the most representative forms of psychological distress, often associated with somatic symptoms such as insomnia, decreased ability to concentrate, and loss of energy (Drapeau *et al.*, 2011; Preville *et al.*, 1995). The World Health Organization (2017) stated that depression is the leading cause of impaired health and emotional functioning (with 4.4% of the world's population suffering from depression; Alhassan *et al.*, 2018), and contributes to the onset and maintenance of several illnesses (Stanković *et al.*, 2021).

Furthermore, depression also contributes to loss of pleasure, feelings of guilt, decreased self-worth, and disturbance of appetite and sleep (Alhassan *et al.*, 2018). In addition to depression and anxiety, stress is also an important facet of psychological distress (Lovibond & Lovibond, 1995). Stress comprises individuals' inability to relax, the presence of alertness, nervousness (Brown *et al.*, 1997), and excessive worry (Szabo', 2010).

The study of psychological distress is important because it has significant health implications, predicting the development of cognitive and physical disorders, as well as reduced quality of life (Zhang *et al.*, 2022). Poor sleep quality reduces individuals' cognitive resources when they face stress and leads them to resort to inappropriate strategies, such as avoidance and rumination (Zhang *et al.*, 2020). Individuals with heightened rejection sensitivity tend to use avoidance strategies when they sense the possibility of social exclusion (Lesnick & Mendle, 2021). The experience of social exclusion can exacerbate rejection sensitivity, leading to the activation of dysfunctional cognitions that predispose individuals to social stress and emotional distress (Niu *et al.*, 2022). Additionally, they may employ various methods to distract attention from negative emotions; previous studies indicate that smartphone usage is one way individuals attempt to reduce negative emotions and distress (Stanković *et al.*, 2021).

Therefore, we consider it relevant to study sleep quality, rejection sensitivity, and smartphone addiction in the context of adults' psychological distress. However, a multilevel approach to studying psychological distress is important to better understand the interaction between psychological and contextual factors and to identify the early signs of psychological distress (Horn *et al.*, 2021). The ecological perspective supports the need for an inter-sectoral approach to analyze the emotional, behavioral, and physical factors that act together when discussing psychological distress (Horn *et al.*, 2021). Furthermore, examining these factors can contribute to establishing effective intervention methods to prevent and manage psychological distress. Thus, in the present study, we used a multi-dimensional perspective to examine adults' psychological distress.

1.1. REJECTION SENSITIVITY AS A RISK FACTOR FOR PSYCHOLOGICAL DISTRESS

Rejection sensitivity is a cognitive-affective bias characterized by the tendency to expect rejection and involves an exaggerated emotional or behavioral response (Gao *et al.*, 2017). This concept was initially defined as a personality disposition that would explain why certain individuals perceive rejection more easily and experience distress when confronted with it (Yu *et al.*, 2021). Researchers generally believe that rejection sensitivity arises as a result of early experiences characterized by neglect and rejection (Gao *et al.*, 2017; Yu *et al.*, 2021). Previous studies have shown that rejection sensitivity is influenced by social exclusion, and the experience of exclusion within the family or peer group contributes to the tendency to expect rejection in the future and is associated with the risk of developing depression (Niu *et al.*, 2022).

According to the cognitive-affective processing systems (CAPS; Ayduk & Gyra, 2008) model, individuals with a high level of rejection sensitivity may misinterpret the actions of others, which is why they are more prone to feelings of loneliness, depression, and anger (Gao *et al.*, 2017). Furthermore, people with high rejection sensitivity may engage in behaviors designed to protect them from it but often end up being excluded (Lesnick & Mendle, 2021), which further contributes to negative beliefs about their abilities to initiate and maintain social contacts (Niu *et al.*, 2022). Once these expectations are activated, they trigger emotional responses such as anger, anxiety, and depression that lead to behaviors of withdrawal, reassurance-seeking, or acceptance-seeking, perceived by others as disturbing (Lesnick & Mendle, 2021). Because these reactions from others reinforce the initial belief about exclusion, individuals with a high level of rejection sensitivity perceive a higher degree of stress in interpersonal relationships and act in ways aimed to reduce the negative emotions associated with rejection (Lesnick & Mendle, 2021). Furthermore, according to Beck's cognitive model of depression (2002), the association between potentially negative events and personal cognitions contributes to the development of depression (Niu *et al.*, 2022). In other words, the experience of social exclusion increases rejection sensitivity and decreases perceived self-efficacy, which ultimately leads to the development of depressive symptoms.

At the same time, some studies suggested that rejection sensitivity can also be preceded by depressive symptoms (Beeson *et al.*, 2020). Also, the anxious anticipation of rejection increases depression risk through interpretation biases, and challenging negative interpretations may reduce depression risk in those who anticipate rejection (Normansell *et al.*, 2017). Given the mixed findings related to the relationship between rejection sensitivity and psychological distress, there is still a need for research investigating this relationship. Thus, the present study aims to add to the literature examining this link by exploring the predictive role of rejection sensitivity for adults' psychological distress.

1.2. SMARTPHONE ADDICTION AND ADULTS' PSYCHOLOGICAL DISTRESS

Due to the rapid development of technology, the potential risks of excessive use of technological means in the emergence of health disorders have been considered in a growing number of studies (Chen *et al.*, 2020). The American Psychiatric Association (2013) highlighted the potential harm of excessive technology use on various aspects of one's health (Chen *et al.*, 2020). Muscle pain, reduced sleep quality, and depressive symptoms are common consequences of problematic technology use (Chen *et al.*, 2020; Lei *et al.*, 2020).

Furthermore, the current literature suggests that addiction is not limited to substance abuse but can also involve behavioral addictions (Matar Boumosleh & Jaalouk, 2017). Behavioral addictions are persistent over time and contribute to negative emotional outcomes (Squires *et al.*, 2021). Smartphone addiction (SA) falls under the category of behavioral addiction (Demirci *et al.*, 2015), though this category can be difficult to conceptualize because it is associated with a multitude of physical, social, and psychological factors (Demirci *et al.*, 2015). SA has been defined as excessive smartphone use, despite awareness of negative consequences, associated with discomfort when access is limited and disruption of daily tasks due to inability to self-control (Squires *et al.*, 2021). Although information regarding SA is not sufficient to classify it as a disorder in the Diagnostic and statistical manual of mental disorders (American Psychiatric Association, 2013), researchers noted the existence of similar mechanisms found in substance addictions (Matar Boumosleh & Jaalouk, 2017). More specifically, these behaviors involve preoccupation, high tolerance, inability to control desire, impairment of daily life, indifference to harmful effects, and withdrawal (Matar Boumosleh & Jaalouk, 2017).

When comparing the effect of Internet addiction on emotional states with that of SA, previous studies have noted a stronger impact of SA (Kim *et al.*, 2018). People seem to be more inclined to use computers when they are required to perform complex tasks, while the use of smartphones has more of a purpose of maintaining social relationships, which can trigger the fear of missing out (Kim *et al.*, 2018). In addition, portability, direct communication, and quick access to the Internet are features that could explain why SA is more common (Demirci *et al.*, 2015; Kim *et al.*, 2018). Thus, an increasing number of studies suggested a significant association between SA and psychological distress (Pourafshari *et al.*, 2022; Squires *et al.*, 2021; Wan Ismail *et al.*, 2020). The need to be easily accessible all the time, the fear of missing out, and the disruption of daily activities are possible explanations of how excessive smartphone use leads to negative emotional outcomes (Oraison *et al.*, 2020).

SA has been examined in previous studies from multiple perspectives (Geng *et al.*, 2021). On the one hand, SA was often considered a predictor of psychological distress (Ismali *et al.*, 2020; Kim *et al.*, 2018; Matar Boumosleh & Jaalouk, 2017),

and on the other hand, as a consequence of it (Demirici *et al.*, 2015; Stanković *et al.*, 2021). For the second perspective, research suggests that individuals seem to use smartphones as a way of distracting attention from negative emotions and reducing psychological distress (Squires *et al.*, 2021; Stanković *et al.*, 2021). A previous study found that self-control mediates the relationship between digital dependence, depression, and anxiety (Geng *et al.*, 2021). Thus, the more individuals exercise control over the time spent using the smartphone, the less likely they are to experience depression and anxiety (Geng *et al.*, 2021). Conversely, individuals who do not exhibit self-control over their smartphone usage time are at high risk of developing depression and anxiety symptoms (Geng *et al.*, 2021). Another study noted that excessive smartphone use is related to stress generated by information overload (Samaha & Hawi, 2016). A high level of stress predisposes individuals to the risk of problematic smartphone use, but at the same time, problematic smartphone use contributes to the onset of stress (Samaha & Hawi, 2016). It has also been observed that SA predicts a reduced quality of life by increasing stress levels (Samaha & Hawi, 2016).

1.3. SLEEP QUALITY – WHY IS IT IMPORTANT FOR ONE’S EMOTIONAL STATE?

Previous research has analyzed sleep quality both from a qualitative perspective, referring to the extent to which individuals feel rested after waking up, and quantitatively, involving the actual duration of sleep (Lemma *et al.*, 2012). The literature suggests that the decrease in sleep quality is associated with the emergence of technology and lifestyle changes (Alrashed *et al.*, 2022; Lemma *et al.*, 2012). Sleep disorders have been considered a result of repeated sleep deprivation due to insufficient sleep hours or fragmentation throughout the night (Lee *et al.*, 2013). Some authors described sleep-related difficulties as the inability to initiate or maintain sleep and the feeling of being unrested upon waking up (Banglioni *et al.*, 2011). Moreover, poor sleep has been associated with experiencing daytime sleepiness (Alhared *et al.*, 2022), difficulties with concentration, risk-taking behaviors, unsatisfactory social relationships (Postans & Pidgeon, 2016), and physical, psychological, and emotional consequences (Seun-Fadipe & Mosaku, 2017). Poor sleep can also be conceptualized as insomnia (Alrashed *et al.*, 2022; Banglioni *et al.*, 2011; Rezaei *et al.*, 2018), which is often considered both a symptom and a predictor of depression (Banglioni *et al.*, 2011), and is significantly associated with anxiety and stress (Alrashed *et al.*, 2022; Rezaei *et al.*, 2018).

High stress is often associated with poor sleep quality (Lemma *et al.*, 2012). For instance, some researchers argued that low sleep quality reduces one’s cognitive resources when facing stressors; individuals with poor sleep respond to stress by using avoidance strategies, rumination, and acceptance of negative emotions, instead of problem-focused strategies (Zhang *et al.*, 2020). A prolonged

period of insufficient rest increases the likelihood of experiencing stress, which is considered a risk factor for developing depression and anxiety (da Estrela *et al.*, 2021; Zhang *et al.*, 2020). Studies have also shown that individuals with poor sleep quality reported high levels of stress, daytime sleepiness, depression, and physical symptoms (Lee *et al.*, 2013).

Other authors investigated bedtime procrastination as a feature of poor sleep quality (Ma *et al.*, 2022; Guo *et al.*, 2020), which increases the risk of developing depression and anxiety symptoms (Demirici *et al.*, 2015; Geng *et al.*, 2021), as well as health-related problems (Guo *et al.*, 2020). It has also been observed that depression predicts a reduced number of hours of sleep, waking up during the night, and a feeling of tiredness during the day (Geng *et al.*, 2021). However, it is not certain whether depression is a predictor or a result of bedtime procrastination (Alvaro *et al.*, 2013; Geng *et al.*, 2021).

Moreover, previous research also suggested that bedtime procrastination could be an explanation for the effect of SA on depression and anxiety (Geng *et al.*, 2021). Exposure to blue light generated by the phone screen during the night contributes to the decrease in cerebral blood flow, and brain electrical activity, delays the onset of melatonin secretion, and reduces the quality of REM sleep (Demirci *et al.*, 2015). Moreover, since smartphones offer various applications that positively stimulate the psychological state of users, likely, they are no longer aware of the passage of time (Geng *et al.*, 2021). Since individuals addicted to social networks have poor sleep and are less involved in physical activities, they are at increased risk of experiencing psychological distress (Wong *et al.*, 2020). The study conducted by Wong *et al.* (2020) showed that time spent on social networks was associated with sleep difficulties, insomnia, and feeling tired during the day. For some people, social media platforms often represent a way of reducing negative emotions or coping with difficult situations (Maftei *et al.*, 2023). However, in an exaggerated attempt to eliminate negative emotions, individuals are more predisposed to unsatisfactory sleep, which contributes to the experience of depression and stress (Wong *et al.*, 2020).

However, it is difficult to identify whether psychological distress is a cause or a predictor of sleep quality (Lemma *et al.*, 2012; Rezaei *et al.*, 2018), due to the various and mixed findings in this area. In the present research, we focused on the predictive role of low sleep quality regarding adults' psychological distress.

2. THE PRESENT STUDY

The current literature highlights the need to further examine the links between rejection sensitivity, smartphone addiction, and sleep quality on adults' psychological distress. The selected variables we chose to examine psychological distress in the present study, i.e., rejection sensitivity, smartphone addiction, and sleep quality, reflect a comprehensive approach rooted in contemporary

psychological theories and empirical research. Rejection sensitivity proposes that individuals high in rejection sensitivity are prone to interpreting ambiguous social cues as signs of rejection, which can lead to heightened emotional distress (Lesnick & Mendle, 2021). Thus, it may serve as a valuable predictor of psychological distress in interpersonal contexts.

Next, the Cognitive-Behavioral Model of Problematic Internet Use suggests that excessive smartphone use can disrupt daily routines, impair social functioning, and exacerbate negative mood states, contributing to psychological distress (Davis, 2001).

Finally, when discussing sleep quality, the Biopsychosocial Model of Insomnia proposes that sleep disturbances can disrupt emotional regulation processes, increase stress reactivity, and compromise cognitive functioning, all of which contribute to psychological distress (Becker *et al.*, 2015).

Previous studies demonstrated that poor sleep quality predisposes individuals to adopt inadequate strategies in coping with stressors, which contributes to the development of depression and anxiety (Zhang *et al.*, 2020). Additionally, the adoption of dysfunctional strategies in the context of emotional regulation is a specific aspect for individuals with heightened sensitivity to rejection (Niu *et al.*, 2022). We can presume that poor sleep quality and the predisposition to rejection sensitivity might accentuate the tendency to use inadequate emotional regulation strategies, such as avoidance, rumination, and acceptance-seeking, which in turn could worsen psychological distress. Additionally, understanding how rejection sensitivity and sleep quality interact could be useful in studying psychological distress and developing useful interventions to address it.

On the one hand, the mixed findings in this area call for further examinations regarding the potential predictive role of these variables. On the other hand, examining the risk factors of psychological distress from multiple perspectives (i.e., examining emotional, behavioral, and physical factors) is highly important given the rise of depression, anxiety, and stress among the general population and its devastating consequences in various aspects of one's life. Thus, the current study aimed to answer the following research question: Which of these factors (i.e., emotional, behavioral, or physical) contributes the most to adults' psychological distress? To answer this question, we conducted the present cross-sectional study, assuming the following:

H1. Rejection sensitivity, smartphone addiction, and low sleep quality would be significantly related to adults' psychological distress.

H2. Rejection sensitivity, smartphone addiction, and low sleep quality would significantly predict adults' psychological distress.

3. METHOD

3.1. PARTICIPANTS AND PROCEDURE

The convenience sample in the present study comprised 236 Romanian adults aged 18 to 58 ($M = 24.58$, $SD = 7.10$, 82.2% females). Inclusion criteria were related to age (> 18) and the use of a smartphone. Participants – who voluntarily took part in the study - were assured of the anonymity and confidentiality of their answers, and the fact that they could withdraw from the research at any time without any consequences. We used a web-based survey, advertised through various social media platforms and e-mail invitations, to collect participants' answers. The time needed to answer all the survey items was around 12 minutes. The research followed the 2013 Helsinki Declaration guidelines and was approved by the Ethical Committee from the faculty where the authors are affiliated.

3.2. MEASURES

Psychological distress. We used the 21-item Depression, Anxiety, and Stress Scale (DASS 21), which is a short version of the 42-item Depression, Anxiety, and Stress Scale (DASS 42) developed by Lovibond and Lovibond in 1995. The scale consists of three subscales measuring depression, anxiety, and stress symptoms in non-clinical populations (example items: "I couldn't seem to experience any positive feeling at all" - depression; "I was aware of dryness of my mouth" - anxiety; "I found it hard to wind down" - stress). Answers were provided on a 4-point Likert scale ranging from 0 (did not apply at all) to 3 (very applicable). Each statement refers to how respondents felt during the last week. Higher scores indicated higher depression, anxiety, and stress symptoms (Foti *et al.*, 2023). In the present study, we used the overall score, with a Cronbach's α of 0.94.

Rejection sensitivity. We used the Tendency to Expect Rejection Scale (TERS) developed by Jobe in 2003. The instrument examines the tendency to feel anxious in situations involving negative evaluations from others. The questionnaire consists of 18 items such as "It is important for me to be accepted by those around me", "I get angry quickly". Participants responded using a 5-point Likert scale, where 1 indicated strong disagreement and 5 indicated strong agreement. The total score ranged between 18 and 90, with a high score indicating increased rejection sensitivity. Cronbach's α in the present study was 0.89.

Smartphone Addiction. We used the SAS-SV questionnaire (Lei *et al.*, 2020), which is the short 10-item version of the Smartphone Addiction Scale (SAS) developed by Kwon *et al.* (2013). The scale consists of items such as "I miss planned work due to smartphone use", "I am not able to stand not having a

smartphone". The instrument was developed to measure smartphone addiction among adolescents, but previous studies also demonstrated its effectiveness among adults (Luk *et al.*, 2018; Hamamura *et al.*, 2023). Participants answered on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree), with higher scores indicating problematic smartphone use. In the present study, Cronbach's α was 0.86.

Sleep Quality. We used the Sleep Quality Scale (SQS) developed by Yi *et al.* in 2006, which comprises 28 items such as "I have difficulty falling asleep", "I wake up during sleep" and measures sleep quality from the last month. The instrument can be applied to a sample aged between 18 and 59 years (Yi *et al.*, 2006). The scale comprises several dimensions, such as reduced functioning during the day, recovery from sleep, difficulty falling asleep, difficulty getting out of bed, rest satisfaction, and ability to maintain sleep. Responses were given on a 4-point Likert scale, ranging from 0 (indicating the occurrence of the aspects described as being 1-3 times a month or very rarely) to 3 (indicating their occurrence 6-7 times a week or very often). The total score ranges from 0 to 84, with higher values suggesting poor sleep quality. Cronbach's α in the present study was 0.89.

A demographic scale assessed participants' age and self-reported gender. The consistency of the quality of the translated research instruments (which were presented in Romanian) was checked using the back-translation technique (Tyupa, 2011), and we did not find any discrepancies.

4. RESULTS

4.1. PRELIMINARY ANALYSIS

Descriptive statistics for the primary variables are presented in Table 1. All variables were normally distributed, with Skewness and Kurtosis values ranging from -1 to +1. We conducted preliminary analyses to investigate whether demographic variables (gender and age) were related to adults' psychological distress. Independent T-test results suggested no significant differences, $t(234) = -1.73$, $p = .08$. Participants' age was not significantly related to psychological distress ($r = -.12$, $p = .06$).

Table no.1.
Descriptive statistics of the main variables (N = 236)

Variable	M	SD	Min	Max	Skewness	Kurtosis
Psychological distress	26.30	14.64	0	61	.14	-.69
Rejection sensitivity	55.18	13.47	19	90	.47	-.62
Smartphone addiction	27.28	10.36	10	54	.47	-.62
Sleep quality	40.64	14.70	3	81	.19	-.10

4.2. ASSOCIATIONS OF MAIN STUDY VARIABLES

The results of the correlational analysis are presented in Table 2. Psychological distress was positively related to rejection sensitivity ($r = .49, p < .001$), SA ($r = .39, p < .001$), and low sleep quality ($r = .64, p < .001$). All the considered predictors were significantly associated with each other (all p -s $< .001$).

Table no.2.
Correlation analyses (N = 236)

Variable	1	2	3
1. Psychological distress	-		
2. Rejection sensitivity	.49**	-	
3. Smartphone addiction	.39**	.34**	-
4. (Low) Sleep quality	.64**	.37**	.40**

** $p < .001$

4.3. REGRESSION ANALYSIS SUMMARIZING HOW REJECTION SENSITIVITY, SMARTPHONE ADDICTION, AND SLEEP QUALITY PREDICT PSYCHOLOGICAL DISTRESS

To examine how much variance in participants' psychological distress was explained by rejection sensitivity, smartphone addiction, and sleep quality, we conducted a multiple regression analysis. The results showed that psychological distress was positively predicted by rejection sensitivity and low sleep quality. Smartphone addiction did not significantly predict psychological distress. The

model was significant, $F(3, 232) = 77.37, p < .001$, and explained 49.4% of the variance in psychological distress. The strongest predictor was low sleep quality, $\beta = .50, p < .001$ (see Table 3).

Table no. 3.

Linear regression analyses for psychological distress (N = 236)

Variable	B (SE)	β
Rejection sensitivity	.29 (.05)	.27**
Smartphone addiction	.12 (.07)	.08
(Low) Sleep quality	.50 (.05)	.50**
R^2		.50**
ΔR^2		.49**

** $p < .001$

5. DISCUSSIONS

The current study examined the predictive role of rejection sensitivity, smartphone addiction, and sleep quality on adults' psychological distress. In line with previous studies (Geng *et al.*, 2021; Wan Ismail *et al.*, 2020), our results suggested a positive association between smartphone addiction and psychological distress. Furthermore, the current findings highlighted the significant and positive association between sleep quality and psychological distress. These results are in line with previous studies that support the idea that a decrease in sleep quality involves insufficient sleep duration and daytime fatigue, which is associated with an increase in psychological distress (Geng *et al.*, 2021; Postans & Pidgeon, 2016; Zhang *et al.*, 2022). Also, the present results also suggested a positive correlation between rejection sensitivity and psychological distress. Previous studies suggested that individuals with a high level of rejection sensitivity presented a low level of perceived self-efficacy, which predisposes them to experience depression (Niu *et al.*, 2022). Our findings are congruent with previous studies, demonstrating that a high level of rejection sensitivity is associated with a high level of psychological distress (Yu *et al.*, 2022).

However, our results suggested that only sleep quality and rejection sensitivity (and not smartphone addiction) significantly predicted psychological distress. One explanation might be related to the positive effects of smartphone use, which might overwrite the harm caused by excessive use. For instance, a study conducted by Stanković *et al.* (2021) suggested that increased smartphone use was associated

with lower levels of stress, which contributed to a decrease in depression levels. According to this perspective, smartphone use might have a compensatory function by generating pleasure, contributing to the reduction of stress factors (Stanković *et al.*, 2021). The authors also suggested that the main function of the smartphone is to maintain communication with others and, for this reason, observing the purpose of smartphone use is important before establishing the degree of problematic use. However, Stanković *et al.* (2021) also underlined that this beneficial effect might be temporary and may not prevent long-term depression. Additionally, previous studies using multiple hierarchical regression suggested that, in association with other variables, such as Internet addiction, smartphone dependence may not have a significant impact on psychological distress (Wan Ismail *et al.*, 2020). However, adding it to the prediction model contributed to the increase in the variance of the psychological distress variable, as in previous studies (Wan Ismail *et al.*, 2020).

In line with previous studies (Lesnick & Mendle, 2021; Mellin, 2008), the present results suggested that rejection sensitivity significantly and positively predicted psychological distress. Lesnick and Mendle (2021, p. 3) proposed the term "self-fulfilling prophecy" to argue the process by which individuals with a high level of rejection sensitivity tend to behave in accordance with their own beliefs, behaviors that end up attracting aversive attitudes from others and contributing to the confirmation of initial beliefs, and ultimately to the experience of psychological distress. Additionally, low levels of self-efficacy and high levels of insecurity can influence individuals' beliefs about their abilities to make social connections (Niu *et al.*, 2022; Yu *et al.*, 2021). The prolonged activation of such beliefs associated with the expectation of rejection contributes to the experience of psychological distress (Yu *et al.*, 2021).

However, the most important finding in the present study relates to the fact that, among the three investigated factors (emotional, behavioral, and physical), sleep quality, i.e., the physical factor contributed the most to adults' psychological distress. On the one hand, the positive links (highlighted both in the previous literature and the current study) between low sleep quality and smartphone addiction highlight the need for extended programs aimed to reduce maladaptive smartphone use, which includes the use of a smartphone before bedtime (Geng *et al.*, 2021; Krishnan *et al.*, 2020) and, generally, prolonged use during the day (Wacks & Weinstein, 2021). On the other hand, this specific result highlights the importance of sleep for preventing and managing psychological distress (Glozier *et al.*, 2010). Nevertheless, the answer to the primary question of our study – *what makes us more emotionally vulnerable?* – seems to lie within the physical area of the potential predictors, at least among the research sample that we examined. However, the positive link between rejection sensitivity, smartphone addiction, and low sleep quality also highlights the various mechanisms that contribute to these findings, and the need to examine psychological distress using a multi-level, extended perspective.

Various limitations need to be accounted for in the present research. The first limitation is related to the small number of participants and the unequal gender distribution. Additionally, the use of self-reported scales is a second limitation of the study. By completing self-report scales, participants could be tempted to provide desirable responses. However, we can consider that, by maintaining the anonymity of the participants and using scientifically validated instruments, we have managed to reduce possible errors in the results. Furthermore, future studies might benefit from using experimental measures to increase the generalizability of the present findings. Longitudinal studies might better reflect the nature of the examined relationships.

6. CONCLUSION

Despite its limitations, the present study contributes to a better understanding of the risk factors for adults' psychological distress. The most important result of this research is related to the significant role of low sleep quality in predicting psychological distress, which seems to contribute to a higher level of adults' depression, anxiety, and stress symptoms, compared to emotional (rejection sensitivity) and behavioral (smartphone addiction) factors. Nevertheless, future experimental and longitudinal studies are needed to better understand these relationships.

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REFERENCES

1. ALHASSAN, A. A., ALQADHIB, E. M., TAHA, N. W., ALAHMARI, R. A., SALAM, M., & ALMUTAIRI, A. F., *The relationship between addiction to smartphone usage and depression among adults: A cross sectional study*. BMC Psychiatry, **18**, 148, 2018, p. 1 – 8. <https://doi.org/10.1186/s12888-018-1745-4>.
2. ALRASHED, F. A., ALSUBIHEEN, A. M., ALSHAMMARI, H., MAZI, S. I., AL-SAUD, S. A., ALAYOUBI, S., KACHANATHU, S. J., ALBARRATI, A., ALDAIHAN, M. M., AHMAD, T., SATTAR, K., KHAN, S., & DHIMAN, G., *Stress, anxiety, and depression in pre-clinical medical students: Prevalence and association with sleep disorders*. Sustainability, **14**, 18, 2022, p. 263–267, <https://doi.org/10.3390/su141811320>
3. ALVARO, P. K., ROBERTS, R. M., & HARRIS, J. K. *A systematic review assessing bidirectionality between sleep disturbances, anxiety, and depression*. Sleep, **36**, 7, 2013, p. 1059–1068. <https://doi.org/10.5665/sleep.2810>.
4. AMERICAN PSYCHIATRIC ASSOCIATION. *Diagnostic and statistical manual of mental disorders* (5th ed.), 2013, <https://doi.org/10.1176/appi.books.9780890425596>

5. AYDUK, O., & GYURAK, A., *Applying the Cognitive-Affective Processing Systems Approach to Conceptualizing Rejection Sensitivity*. Social and Personality Psychology Compass, **2**, 5, 2008, p. 2016–2033, <https://doi.org/10.1111/j.1751-9004.2008.00143.x>
6. BECKER, S. P., LANGBERG, J. M. & BYARS, K. C. *Advancing a Biopsychosocial and Contextual Model of Sleep in Adolescence: A Review and Introduction to the Special Issue*. Journal of Youth and Adolescence, **44**, 2015, p. 239–270, <https://doi.org/10.1007/s10964-014-0248-y>
7. BEESON, C. M., BRITTAIN, H., & VAILLANCOURT, T., *The temporal precedence of peer rejection, rejection sensitivity, depression, and aggression across adolescence*. Child Psychiatry & Human Development, **51**, 5, 2020, p. 781 – 791, <https://doi.org/10.1007/s10578-020-01008-2>
8. BROWN, T. A., CHORPITA, B. F., KOROTITSCH, W., & BARLOW, D. H., *Psychometric properties of the Depression Anxiety Stress Scales (DASS) in clinical samples*, Behaviour Research and Therapy, **35**, 1, 1997, p. 79–89. [https://doi.org/10.1016/s0005-7967\(96\)00068-x](https://doi.org/10.1016/s0005-7967(96)00068-x)
9. CHEN, I.-H., PAKPOUR, A. H., LEUNG, H., POTENZA, M. N., SU, J.-A., LIN, C.-Y., & GRIFFITHS, M. D., *Comparing generalized and specific problematic smartphone/internet use: Longitudinal relationships between smartphone application-based addiction and social media addiction and psychological distress*, Journal of Behavioral Addictions, **9**, 2, 2020, p. 410–419. <https://doi.org/10.1556/2006.2020.00023>
10. DA ESTRELA, C., MCGRATH, J., BOOIJ, L., & GOUIN, J. P., *Heart rate variability, sleep quality, and depression in the context of chronic stress*. Annals of Behavioral Medicine, **55**, 2, 2021, p. 155–164, <https://doi.org/10.1093/abm/kaaa039>
11. DAVIS, R. A., *A cognitive - behavioral model of pathological Internet use (PIU)*. Computers in Human Behavior, **17**, 2001, p. 187–195, [10.1016/S0747-5632\(00\)00041-8](https://doi.org/10.1016/S0747-5632(00)00041-8).
12. DEMIRCI, K., AKGONUL, M., & AKPINAR, A., *Relationship of smartphone use severity with sleep quality, depression, and anxiety in university students*. Journal of Behavioral Addictions, **4**, 2, 2015, p. 85–92, <https://doi.org/10.1556/2006.4.2015.010>
13. DRAPEAU, A., MARCHAND, A. & BEAULIEU-PRÉVOS, D., *Epidemiology of Psychological Distress*, in L'ABATE, L. (Ed.). *Mental Illnesses – Understanding, Prediction and Control* (p. 105–135), Rijeka, InTech, 2011.
14. FOTI, F. L., KARNER-HUȚULEAC, A., & MAFTEI, A., *The value of motherhood and psychological distress among infertile women: The mediating role of coping strategies*, Frontiers in Public Health, **11**, 1024438, 2023. <https://doi.org/10.3389/fpubh.2023.1024438>
15. GAO, S., ASSINK, M., CIPRIANI, A., & LIN, K., *Associations between rejection sensitivity and mental health outcomes: A meta-analytic review*, Clinical Psychology Review, **57**, 2017, p. 59–74, <https://doi.org/10.1016/j.cpr.2017.08.007>
16. GENG, Y., GU, J., WANG, J., & ZHANG, R., *Smartphone addiction and depression, anxiety: The role of bedtime procrastination and self-control*, Journal of Affective Disorders, **293**, 2021, p. 415–421,

- <https://doi.org/10.1016/j.jad.2021.06.062>
17. GLOZIER, N., MARTINIUK, A., PATTON, G., IVERS, R., LI, Q., HICKIE, I., ... & STEVENSON, M., *Short sleep duration in prevalent and persistent psychological distress in young adults: the DRIVE study*, *Sleep*, **33**, 9, 2010, p. 1139–1145, <https://doi.org/10.1093/sleep/33.9.1139>.
 18. GUO, J., MENG, D., MA, X., ZHU, L., YANG, L., & MU, L., *The impact of bedtime procrastination on depression symptoms in Chinese medical students*, *Sleep and Breathing*, **24**, 3, 2020, p. 1247–1255, <https://doi.org/10.1007/s11325-020-02079-0>
 19. HAMAMURA, T., KOBAYASHI, N., OKA, T., KAWASHIMA, I., SAKAI, Y., TANAKA, S. C., & HONJO, M., *Validity, reliability, and correlates of the smartphone addiction scale–short version among Japanese adults*, *BMC Psychology*, **11**, 1, 2023, <https://doi.org/10.1186/s40359-023-01095-5>
 20. HORN, R., ARAKELYAN, S., WURIE, H., & AGER, A., *Factors contributing to emotional distress in Sierra Leone: A socio-ecological analysis*, *International Journal of Mental Health Systems*, **15**, 1, 2021, <https://doi.org/10.1186/s13033-021-00474-y>
 21. JOBE, R. L., *Emotional and physiological reactions to social rejection: the development and validation of the tendency to expect rejection scale and the relationship between rejection expectancy and responses to exclusion*, PhD diss., TRACE: Tennessee Research and Creative Exchange, 2003.
 22. KIM, Y.-J., JANG, H., LEE, Y., LEE, D., & KIM, D.-J., *Effects of internet and smartphone addictions on depression and anxiety based on propensity score matching analysis*, *International Journal of Environmental Research and Public Health*, **15**, 5, 2018, p. 2 – 10. <https://doi.org/10.3390/ijerph15050859>
 23. KRISHNAN, B., SANJEEV, R. K., & LATTI, R. G., *Quality of sleep among bedtime smartphone users*, *International Journal Of Preventive Medicine*, **11**, 2020, https://doi.org/10.4103/ijpvm.IJPVM_266_19
 24. LEI, L. Y.-C., ISMAIL, M. A.-A., MOHAMMAD, J. A.-M., & YUSOFF, M. S. B., *The relationship of smartphone addiction with psychological distress and neuroticism among university medical students*, *BMC Psychology*, **8**, 1, 2020, <https://doi.org/10.1186/s40359-020-00466-6>
 25. LEMMA, S., GELAYE, B., BERHANE, Y., WORKU, A., & WILLIAMS, M. A., *Sleep quality and its psychological correlates among university students in Ethiopia: A cross-sectional study*, *BMC Psychiatry*, **12**, 1, 2012, <https://doi.org/10.1186/1471-244x-12-237>
 26. LESNICK, J., & MENDLE, J., *Rejection sensitivity and negative urgency: A proposed framework of intersecting risk for peer stress*. *Developmental Review*, **62**, 100998, 2021, <https://doi.org/10.1016/j.dr.2021.100998>.
 27. LOVIBOND, P. F., & LOVIBOND, S. H., *The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories*. *Behaviour Research and Therapy*, **33**, 3, 1995, p. 335–343, [https://doi.org/10.1016/0005-7967\(94\)00075-U](https://doi.org/10.1016/0005-7967(94)00075-U)
 28. LUK, T. T., WANG, M. P., SHEN, C., WAN, A., CHAU, P. H., OLIFFE, J., VISWANATH, K., CHAN, S. S.- C., & LAM, T. H., *Short version of the*

- Smartphone Addiction Scale in Chinese adults: Psychometric properties, sociodemographic, and health behavioral correlates*. Journal of Behavioral Addictions, **7**, 4, 2018, p. 1157–1165, <https://doi.org/10.1556/2006.7.2018.105>
29. MA, X., MENG, D., ZHU, L., XU, H., GUO, J., YANG, L., ... & MU, L., *Bedtime procrastination predicts the prevalence and severity of poor sleep quality of Chinese undergraduate students*, Journal of American College Health, **70**, 4, 2022, p. 1104 – 1111.
 30. MAFTEI, A., MERLICI, I. A., & DĂNILĂ, O., *Social media use as a coping mechanism during the COVID-19 pandemic: A multidimensional perspective on adolescents' well-being*, Frontiers in Public Health, **10**, 1062688, 2023, <https://doi.org/10.3389/fpubh.2022.1062688>.
 31. MATAR BOUMOSLEH, J., & JAALOUK, D., *Depression, anxiety, and smartphone addiction in university students – A cross sectional study*. Plos One, **12**, 8, 2017, <https://doi.org/10.1371/journal.pone.0182239>.
 32. MELLIN, E. A., *Rejection sensitivity and college student depression: Findings and implications for counseling*, Journal of College Counseling, **11**, 1, 2008, p. 32 – 41.
 33. NIU, G.-F., SHI, X.-H., YAO, L.-S., YANG, W.-C., JIN, S.-Y., & XU, L., *Social Exclusion and Depression among undergraduate students: The mediating roles of rejection sensitivity and social self-efficacy*, Current Psychology, 2022, <https://doi.org/10.1007/s12144-022-03318-1>.
 34. NORMANSELL, K. M., & WISCO, B. E., *Negative interpretation bias as a mechanism of the relationship between rejection sensitivity and depressive symptoms*, Cognition and Emotion, **31**, 5, 2017, p. 950 – 962, <https://doi.org/10.1080/02699931.2016.1185395>.
 35. ORAISON, H., NASH-DOLBY, O., WILSON, B., & MALHOTRA, R., *Smartphone distraction-addiction: Examining the relationship between psychosocial variables and patterns of use*, Australian Journal of Psychology, **72**, 2, 2020, p. 188–198. <https://doi.org/10.1111/ajpy.12281>
 36. POSTANS, A., & PIDGEON, A., *Sleep quality and mindfulness as predictors of depression, anxiety and stress*, International Journal of Psychology and Behavioral Sciences, **6**, 2, 2016, p. 71–75, <https://doi.org/10.5923/j.ijpbs.20160602.06>.
 37. POURAFSHARI, R., REZAPOUR, T., RAFEI, P., & HATAMI, J., *The role of depression, anxiety, and stress in problematic smartphone use among a large sample of Iranian population*, Journal of Affective Disorders Reports, **10**, 100436, 2022. <https://doi.org/10.1016/j.jadr.2022.100436>.
 38. REZAEI, M., KHORMALI, M., AKBARPOUR, S., SADEGHNIAT-HAGIGHI, K., & SHAMSIPOUR, M., *Sleep quality and its association with psychological distress and sleep hygiene: A cross-sectional study among pre-clinical medical students*, Sleep Science, **11**, 4, 2018, p. 274 – 280, <https://doi.org/10.5935/1984-0063.20180043>
 39. SAMAHA, M., & HAWI, N. S., *Relationships among smartphone addiction, stress, academic performance, and satisfaction with life*, Computers in Human Behavior, **57**, 2016, p. 321–325, <https://doi.org/10.1016/j.chb.2015.12.045>

40. SEUN-FADIPE, C. T., & MOSAKU, K. S., *Sleep quality and psychological distress among undergraduate students of a Nigerian university*, *Sleep Health*, **3**, 3, 2017, p. 190–194, <https://doi.org/10.1016/j.sleh.2017.02.004>
41. SQUIRES, L. R., HOLLETT, K. B., HESSON, J., & HARRIS, N., *Psychological distress, emotion dysregulation, and coping behaviour: A theoretical perspective of problematic smartphone use*. *International Journal of Mental Health and Addiction*, **19**, 2021, p. 1284–1299, <https://doi.org/10.1007/s11469-020-00224-0>
42. STANKOVIĆ, M., NEŠIĆ, M., ČIČEVIĆ, S., & SHI, Z., *Association of smartphone use with depression, anxiety, stress, sleep quality, and internet addiction. Empirical evidence from a smartphone application*, *Personality and Individual Differences*, **168**, 110342, 2021, <https://doi.org/10.1016/j.paid.2020.110342>.
43. TYUPA, S., *A theoretical framework for back-translation as a quality assessment tool*. *New Voices in Translation Studies*, **7**, 1, 2011, p. 35– 46.
44. WACKS, Y., & WEINSTEIN, A. M., *Excessive smartphone use is associated with health problems in adolescents and young adults*, *Frontiers in Psychiatry*, **12**, 762, 2021, <https://doi.org/10.3389/fpsy.2021.669042>
45. WAN ISMAIL, W. S., SIM, S. T., TAN, K., BAHAR, N., IBRAHIM, N., MAHADEVAN, R., NIK JAAFAR, N. R., BAHARUDIN, A., & ABDUL AZIZ, M., *The relations of internet and smartphone addictions to depression, anxiety, stress, and suicidality among public university students in Klang Valley, Malaysia*, *Perspectives in Psychiatric Care*, **56**, 4, 2020, p. 949 – 955, <https://doi.org/10.1111/ppc.12517>
46. WONG, H. Y., MO, H. Y., POTENZA, M. N., CHAN, M. N. M., LAU, W. M., CHUI, T. K., PAKPOUR, A. H., & LIN, C.-Y., *Relationships between severity of internet gaming disorder, severity of problematic social media use, sleep quality and psychological distress*, *International Journal of Environmental Research and Public Health*, **17**, 6, 2020, <https://doi.org/10.3390/ijerph17061879>
47. YI, H., SHIN, K., & SHIN, C., *Development of the sleep quality scale*, *Journal of Sleep Research*, **15**, 3, 2006, p. 309–316, <https://doi.org/10.1111/j.1365-2869.2006.00544.x>
48. YU, S., SHI, J., HUANG, J., FAN, S., & XU, W., *Longitudinal relationship between emotional insecurity and adolescent mental health: The mediation of rejection sensitivity and moderation of dispositional mindfulness*, *Mindfulness*, **12**, 2021, p. 2662–2671, <https://doi.org/10.1007/s12671-021-01727-0>
49. ZHANG, W.-J., YAN, C., SHUM, D., & DENG, C.-P., *Responses to academic stress mediate the association between sleep difficulties and depressive/anxiety symptoms in Chinese adolescents*. *Journal of Affective Disorders*, **263**, 2020, p. 89–98, <https://doi.org/10.1016/j.jad.2019.11.157>
50. ZHANG, C., XIAO, S., LIN, H., SHI, L., ZHENG, X., XUE, Y., DONG, F., ZHANG, J., & XUE, B., *The association between sleep quality and psychological distress among older Chinese adults: A moderated mediation model*, *BMC Geriatrics*, **22**, 35, 2022, <https://doi.org/10.1186/s12877-021-02711-y>

REZUMAT

O abordare multinivelară în studiul distresului psihologic este esențială pentru a înțelege mai bine interacțiunea dintre factorii psihologici și contextuali și pentru a identifica semnele timpurii ale distresului psihologic. Studiul transversal prezent a utilizat o perspectivă multidimensională pentru a examina distresul psihologic al adulților. Ne-am interesat să explorăm rolurile predictorilor emoționali (adică sensibilitatea la respingere), comportamentali (adică dependența de smartphone) și fizici (adică calitatea somnului) ai distresului psihologic în rândul adulților. Eșantionul nostru a inclus 236 de adulți români cu vârste cuprinse între 18 și 58 de ani ($M = 24,58$, $SD = 7,10$, 82,2% femei). Criteriile de includere au fost legate de vârstă (> 18 ani) și de utilizarea unui smartphone. Participanții au completat un sondaj online la începutul anului 2023. Analizele de corelație au sugerat că dependența crescută de smartphone, calitatea scăzută a somnului și sensibilitatea crescută la respingere au fost asociate semnificativ cu un stres psihologic ridicat. Vârsta nu a fost asociată semnificativ cu stresul psihologic și nu s-au găsit diferențe semnificative bazate pe gen în acest sens. Rezultatele analizei multiple de regresie ierarhică au sugerat că stresul psihologic a fost cel mai bine prezis de calitatea somnului și sensibilitatea la respingere. Dependența de smartphone nu a fost un predictor semnificativ în modelele propuse. Discutăm descoperirile prezente cu privire la implicațiile lor practice referitoare la potențialele intervenții pentru reducerea stresului psihologic în rândul adulților.