ELTE | FACULTY OF EDUCATION AND PSYCHOLOGY

The Abstract Booklet of the Dissertation:

Problematic Smartphone Use and Cyberchondria – Measures and Correlates

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Dissertation Summary

The dissertation titled "Problematic Smartphone Use and Cyberchondria – Measures and Correlates" is comprised of four studies dealing with problematic smartphone use (PSU), smartphone addiction (SA), and cyberchondria. The PSU and SA are used as synonyms (Busch & McCarthy, 2021; Panova & Carbonell, 2018) throughout the thesis, but regardless of name, what connects this construct with cyberchondria – the repetitive, compulsive, and harmful online search of health symptoms, is the problematic technology use, more specifically, problematic internet use (PIU), also often used as a synonym for internet addiction (IA). Modern smartphones' functionalities are primarily based on a (constant) internet connection; without it, they are useless (Montag & Reuter, 2017). At the same time, cyberchondria is a behavior strictly related to searching for bodily symptoms online, including using the internet definition (Vismara et al., 2020).

Another connecting point, besides that the mentioned behaviors are technology-related, is that the PSU, PIU, and cyberchondria could potentially be conceptualized as behavioral addictions. Currently, in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; DSM–5; American Psychiatric Association [APA], 2013), the only non-substance-related disorder is a gambling disorder – known as pathological gambling in the 4th edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-4-TR; 4th ed., text rev. American Psychiatric Association [APA], 2000) and is considered an impulse control-related condition. Therefore, a significant part of the dissertation's Introduction section is dedicated to behavioral addiction to get a reader familiar with the current status of behavioral addictions, the lack of consensus, and the reasons why the mentioned problematic technology-related behaviors, such as PSU or cyberchondria, could be considered non-substance addictions. The future versions

of DSM will most likely include the internet gaming disorder (IGD) as the official diagnosis. Still, we are dealing with constructs that are not officially recognized yet.

What makes the situation even more complicated is the debate around – not whether these behaviors should be conceptualized as addictions but whether they should even be considered pathologies (Billieux et al., 2015). Another part of the dissertation, the Introduction, discusses this problem in detail. There are concerns among the experts in the field that we tend to pathologize typical, modern, everyday behaviors, such as smartphone or internet use, and that there is no justification for classifying them as disorders nor for applying the criteria for substance use and gambling disorders to "diagnose" these conditions. On the other hand, many studies and textbooks describe the similarities between technology-related disorders with the gambling disroder and substance use-related disorders in symptomatology, neurobiological mechanisms, and cognition (e.g., Montag & Reuter, 2017; Petry et al., 2018; Pontes, 2022; Rosenberg & Feder, 2014), et cetera. Therefore, the readers are briefly introduced to the current status of PSU, cyberchondria, and the main frameworks from which they are researched.

The Topic Relevance

The need for these studies was not just a result of the existing research gap, but also a response to the escalating (problematic) technology use behaviors and cyberchondria, particularly during the COVID-19 pandemic. The increased boredom during curfews and heightened anxiety about the coronavirus were directly linked to the surge in internet usage, smartphone use, and online health-related searches. More crucial than the time spent on the internet or a smartphone was the motivation for the use. The motivations such as boredom avoidance, reassurance seeking, coping with negative moods, and escaping unpleasant real-life situations were arguably more significant in explaining the problematic smartphone/internet use, and of course, the cyberchondria, than mere frequency and duration of use.

Besides the COVID-19 context, PSU has been highly relevant for the past decade and more ever since smartphones became widespread and affordable, with promptly increasing functionalities. The same is true for cyberchondria, which became a concern years before the COVID-19 pandemic. The pandemic only served as a facilitator for these problematic technology-related behaviors, which is why it was essential to look at this dissertation's findings through the lenses of the pandemic.

More studies are needed in the context of the Serbian population and properly adapted and validated instruments for measuring PSU and cyberchondria in the Serbian population. Several correlates and mechanisms of the primary constructs of interest, which I found interesting and important, were also investigated – such as the connection between cyberchondria, pseudoscientific practices (PSP), and complementary-alternative medicine (CAM) utilization, as well as conspiracy mentality, also highly elevated during the pandemic.

Finally, as a wrap-up of the dissertation, we explored the relationship between intolerance of uncertainty (IU), cyberchondria, and PSU. The IU relates to a transdiagnostic construct that lies in the core of anxiety-related disorders, which might even be the cause of anxiety-related and other mood disorders (Mahoney & McEvoy, 2012; McEvoy & Mahoney, 2012). It implies the decreased ability of a person to tolerate (endure) the negative response, which is a consequence of perceived uncertainty (Carleton, 2016). I found IU interesting in this dissertation topic because several studies showed the connection between IU, PIU, and PSU (Carleton et al., 2019; Rozgonjuk et al., 2019). In addition, the IU is correlated with the increased coping motivation for alcohol consumption (Oglesby et al., 2015). This disposition is related to problematic technology use and compulsive and addiction-like behaviors and might be important in explaining the PSU as well.

The Main Objectives of the Dissertation

The main objectives were to (1) illuminate the relationship between PSU and the motivation/use purpose of smartphones measured simply by a single item, (2) adapt and validate instruments for assessment of PSU and cyberchondria, namely Smartphone Application-Based Addiction Questionnaire (SABAS; Csibi et al., 2018), Cyberchondria Severity Scale (CSS-12; McElroy et al., 2019), and Short Cyberchondria Scale (SCS; Jokić-Begić et al., 2019), (3) to investigate one of the possible mechanisms through which cyberchondria affects the use of COVD-related PSP, and general use of CAM, (4) to inspect whether there is a unique relationship between IU and PSU, and cyberchondria and IU, holding anxiety and depression symptoms, use purpose and frequency, as well as age and gender constant. The three studies were conducted on the Serbian population, using tools adapted to Serbian, and the first study comprised mostly Serbian-speaking participants. We hope the overall findings will facilitate and encourage further research on PSU and cyberchondria on the Serbian population.

Main Results

The main findings of the thesis can be summarized as follows. First, we replicated the previous findings that entertainment use was positively related to PSU, where perceived stress explained a part of this relationship. Perceived stress also served as a mediator between satisfaction with life and PSU. The results were obtained from a mostly Serbian-speaking sample with a good command of English filling out the survey in English. Secondly, the SABAS was back-translated and adapted to the Serbian language and validated with the existing SAS-SV (Nikolic et al., 2021), other psychological problem measures, such as worry, depression, and anxiety results, and smartphone use-related variables. The results also suggested good test-retest reliability of the Serbian SABAS. Thirdly, we translated and validated the two measures of

cyberchondria (CSS-12 and SCS). While the CSS-12 required an adaptation from the original English, the four-item SCS was adapted from the original Croatian language and thus needed only minor changes due to the remarkable resemblance of the Serbian and Croatian languages. The CSS-12 was validated using health anxiety (HAQ; Lucock & Morley, 1996), internet addiction (IAT; Dukanac et al., 2016; Widyanto & McMurran, 2004), and the obsessions component from the Obsessional-Compulsive Inventory-Revised (OCI-R; Foa et al., 2002; Purić et al., 2018). We concluded that the CSS-12 is best used if there is a need to assess the individual components of cyberchondria (reassurance, distress, compulsiveness, and excessiveness).

In contrast, SCS should be used to determine the general cyberchondria in the Serbian population until further validation of the two instruments is carried out. Within the same study, the results showed the mediating role of conspiracy mentality (CMQ; Bruder et al., 2013; Lukić et al., 2019) between cyberchondria and PSPs, as well as CAM, but the mediating effects were minimal, leaving room for additional essential variables to be included in the model. Cyberchondria was positively related to both PSP and CAM. Finally, cyberchondria was a unique predictor of PSU in the hierarchical regression analysis. In other words, cyberchondria had a unique contribution to explaining PSU variance, over and above intolerance of uncertainty, depression, and anxiety symptoms, smartphone use purpose and frequency, and demographic variables. These findings contribute to our understanding of PSU and cyberchondria and inspire and motivate further research in this area.

General Discussion

Overall, the findings of this dissertation present a valuable addition to the existing problematic technology behaviors, namely smartphone addiction and cyberchondria. The dissertation contributes to the research of this topic on a Serbian population by offering validated instruments suitable for studies on Serbian samples. Hopefully, these studies will promote

further validation of these instruments and the scarce research on the Serbian population. The results offered initial insights into the relationship between cyberchondria and PSP/CAM and the association between intolerance of uncertainty, cyberchondria, and the PSU. The limitations and the future directions are presented individually for each study.

The following are the abstracts of the four studies comprising this dissertation.

Abstracts

Hedonic use, stress, and life satisfaction as predictors of smartphone addiction

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Abstract

This study examined the relationship between hedonic smartphone use (entertainment, social media, games), perceived life stress, and satisfaction with life with smartphone addiction (SA). We tested the connections using structural equation modeling (SEM) on questionnaire data obtained from 410 participants (73.2% women). Results indicated a good overall fit of the model ($\chi^2(36) = 58.06$, $p = .011$; CFI = 0.970, TLI = 0.954, RMSEA [90% CI] = 0.039 [0.019, 0.056], SRMR = 0.037). Perceived stress and hedonic use were positive predictors of SA ($\beta = 0.264$, $p = .001$ and $\beta = 0.176$, $p = .002$, respectively). Satisfaction with life did not directly predict SA, but an indirect effect, via perceived stress, was statistically significant ($\beta = -0.146$, $p = .001$). Women showed greater SA than men, but the effect of age was not significant. Perceived stress was negatively predicted by satisfaction with life, and positively by hedonic use. Based on the compensatory internet use theory, hedonic or non-utilitarian smartphone use might be associated with SA. The study concludes that being female, hedonic smartphone use, and perceived life stress predict SA.

Keywords: Dependence, entertainment, Internet, leissure, mobile phone

Cyberchondria and Questionable Health Practices: The Mediation Role of Conspiracy Mentality

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Abstract

Cyberchondria is a pattern of repetitive search for health information online, which has adverse psychological consequences in spite of its intention to relieve anxiety. This phenomenon is particularly relevant in the current pandemic accompanied by increased levels of uncertainty and fear, which can lead to increased volume of health information search on the internet, as well as cyberchondria. The first objective of this study was to test the factor structure, reliability, and convergent validity of Serbian adaptations of the Cyberchondria Severity Scale (CSS-12) and the Short Cyberchondria Scale (SCS). The second aim was to test the direct effects of cyberchondria on pseudoscientific practices (PSP) and the use of complementary/alternative medicine (CAM) as well as its indirect effects through conspiracy mentality (CMQ). The sample included 511 participants (73.6% women) from Serbia, from the general population. The results support the adequate alpha reliabilities and four-factor structure of CSS-12 and the single-factor structure of SCS, as well as their positive correlations with health anxiety (HAQ), internet addiction (IAT), and obsessive-compulsive symptoms (OCI-R Obsessions) and a negative correlation with self-esteem (a single-item scale). Additionally, the composite cyberchondria score had both direct and indirect effects

on both questionable health practices. Our results revealed conspiracy mentality as one of the possible mechanisms through which cyberchondria is related to the use of PSP/CAM. It stems from distress related to cyberchondria and leads to an increased likelihood of adopting PSPs or CAM as a tool for maintaining a sense of control in an uncertain situation.

Keywords: cyberchondria, complenetary/alternative medicine, pseudoscientific practices, conspiracy mentality

Psychometric Properties of the Serbian Smartphone Application-Based Addiction Scale (SABAS) and Validation of the English Version Among Non-native English Speakers

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Abstract

The present study evaluated the psychometric properties of the Serbian Smartphone Application-Based Addiction Scale (SABAS) and the original English version of the same scale administered to a Serbian-speaking sample. In Study 1, 599 participants completed Serbian SABAS, with 189 having both test and retest data. Results suggested good internal consistency ($\alpha = .81$) and test–retest reliability ($ICC = .795$, $p < .001$, 95% CI [.731, .844], $r_{test\text{-}retest} = .803$) of the scale. Convergent validity of the SABAS was evaluated through correlations with the Smartphone Addiction Scale–Short Version (SAS-SV), as well as with anxiety, depression, worry, duration, and purpose of smartphone use. Divergent validity of the SABAS was evaluated through comparing the correlations with entertainment and productive smartphone use. The modified CFA model showed an acceptable fit ($\chi^2(8) = 25.53$, $p = .001$,

CFI = .961, TLI = .926, RMSEA = .096, SRMR = .042), confirming the unidimensionality of the SABAS. In the second study, the English SABAS, completed by 335 non-native speakers from Serbia, also showed a good fit of the single-factor model ($\chi^2(9) = 12.56$, $p = .184$, CFI = .990, TLI = .984, RMSEA = .036, SRMR = 0.026), and good psychometric features. Based on the study's findings, the Serbian version of SABAS is a reliable and valid measure for screening the risk of smartphone addiction. Moreover, the English version can be used among non-native Serbian English speakers.

Keywords: behavioural addiction, mobile phone, psychometric, smartphone addiction, validation, SABAS

Are Cyberchondria and Intolerance of Uncertainty Related to Smartphone Addiction?

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Abstract

Smartphones are a medium for performing online activities, and one such activity could be the compulsive online health information search — cyberchondria. This study aimed to test whether cyberchondria and intolerance of uncertainty (IU) positively predict smartphone addiction (SA), adjusted for age, gender, daily use duration, the reason for using smartphones, and symptoms of anxiety and depression. The sample consisted of 471 adults (55.2% women) from the general population without chronic diseases (M_{age} = 38.67). Regression analysis showed that IU was a positive predictor of SA (β = .17, $p < .001$), as well as cyberchondria (β = .14, $p < .001$), which had a unique contribution to the explanation of SA, relative to IU. Other significant predictors were average daily smartphone use and entertainment use, the latter being the strongest predictor in the model. These results revealed cyberchondria as a unique predictor of SA.

Keywords: Behavioral addiction, cyberchondria, intolerance of uncertainty, problematic smartphone use, smartphone addiction

Publications Comprising this Dissertation

Vujić, A., Dinić, B. M., & Jokić-begić, N. (2022). Cyberchondria and Questionable Health Practices: The Mediation Role of Conspiracy Mentality. *Studia Psychologica, 64*(1), 104–117. https://doi.org/10.31577/sp.2022.01.842

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