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Problematic Social Media Use in Working Adults: Examining the Influence of Online and Offline Need Satisfaction and Fear of Missing Out

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ABSTRACT

The effect of social media (SM) use on mental health and well-being is a controversial subject among public and scientific discourses, especially since the emergence of problematic usage patterns characterised by addiction-like behaviours. Drawing on self-determination theory (SDT), this cross-sectional study explores the associations between need satisfaction in SM and offline domains and the fear of missing out (FoMo) and PSMU. The study recruited a convenience sample of 186 adults aged 18-58 (M= 38.61, SD= 10.18). A hierarchical multiple regression analysis examined the predictive ability of need satisfaction in SM and offline, as well as FoMo on PSMU, after controlling for age and the number of SM accounts. The complete predictive model accounted for 33.8% of the variance in PSMU, with predictors within the SDT framework contributing significantly to the incremental variance beyond the control variables, uniquely explaining 22.5% of the variance. FoMo emerged as the strongest predictor of PSMU ($\beta = .41$, $p < .001$), followed by need satisfaction in the SM domain ($\beta = -.21$, $p < .05$), while need satisfaction in the offline domain showed no significant association. These findings support the role of FoMo and need deficits in the SM domain as significant vulnerability factors for PSMU, suggesting a domain-specific compensatory mechanism. This research extends the current understanding of PSMU predictors beyond the commonly studied adolescent and young adult populations, highlighting the relevance of digital wellbeing interventions for working adults across different generations.

Keywords: Problematic Social Media Use, Self-Determination Theory, Fear of Missing Out, Need Satisfaction, Digital Wellbeing

INTRODUCTION

The proliferation of social media (SM) platforms has transformed human communication and interaction, connecting millions through profiles, facilitating social networking, and becoming an important avenue for self-expression and identity formation (Obar & Wildman, 2015). The constantly evolving SM landscape, shaped by technological advancements, user

preferences, and business models (Vuorre et al., 2021) is gaining popularity. Over 5 billion people use SM, accounting for 62.3% of the global population. Northern Europe holds the highest penetration at 81.7%, while in Greece, the percentage is 71.7% (Kemp, 2024). The widespread integration of SM into everyday life has sparked a debate in both public and scientific discourses regarding the mental health implications of an increasingly technology-driven lifestyle, particularly among young adults (Johannes et al., 2022; Walsh et al., 2024), for whom being "always on" has evolved into a cultural norm (Griffiths & Kuss, 2017) and a fundamental need (Zhou et al., 2021).

There is significant uncertainty regarding the nature of the relationship between SM use and well-being (Orben et al., 2022). Narratives of harmful effects are accompanied by data showing a decline in psychological well-being and an increase in anxiety and depressive symptoms during pre-adulthood (Haidt, 2024). However, empirical evidence has not consistently supported the association between general SM use and well-being (Odgers & Jensen, 2020; Orben, 2020), and the few experiments with high external validity demonstrate no causal effects (Johannes et al., 2022). Furthermore, experimental research exploring the impacts of SM abstinence has produced inconsistent results (Radtke et al., 2022). It is advocated that indiscriminate measures at a general level of screentime cannot induce uniform effects on well-being (Büchi, 2021), highlighting the need for a more nuanced level of investigation (Orben, 2020). Nevertheless, for a significant minority of individuals, excessive SM use may lead to the development of problematic patterns of engagement, characterised by addiction-like behaviours (Griffiths, 2022). This problematic social media use (PSMU) is associated with alterations in overall functioning (Andreassen et al., 2017) and moderate yet significant adverse mental health outcomes (e.g., Huang, 2022; Shannon et al., 2022), making it an important area of scientific inquiry.

Problematic Social Media Use

It is suggested that excessive SM use gradually becomes problematic when SM are preferred over in-person interactions (Casale, 2020). From a behavioural addiction perspective, PSMU is manifested through increased preoccupation with SM (salience), aimed at alleviating negative affect (mood modification), which may lead to heightened usage to achieve the same level of pleasure (tolerance), suffering when not using (withdrawal), impairment of essential life domains (conflict), and the desire or unsuccessful attempts to control use (relapse) (Andreassen et al., 2017). Critical challenges remain in operationalising PSMU, including whether it is platform-specific or a broader behavioural phenomenon. The lack of high-quality epidemiological, neurobiological, and clinical data also hinders its recognition as a psychiatric disorder (Griffiths, 2022).

Research on prevalence rates has produced varying results, primarily due to the use of different scales and cutoff scores (Casale et al., 2023). A recent meta-analysis across thirty-two countries revealed a pooled global prevalence of 24%, with higher rates observed in collectivistic nations, Eastern and Southern Europe (Cheng et al., 2021). Although some individual studies reported gender differences, meta-analyses have generally indicated no significant gender disparities in PSMU (Cheng et al., 2021; Meng et al., 2022). In terms of age, Cheng et al. (2021) reported a significantly higher prevalence among adolescents than young adults, while no studies have examined prevalence in older adults. Finally, in Greece, a prevalence rate of 13% is reported for adolescents, where girls exhibited a higher rate (Leimonis & Koutra, 2022). Variations in prevalence rates might suggest cultural or individual differences in the development and maintenance of PSMU (Casale et al., 2023). PSMU, although not a recognised disorder, signifies a maladaptive

relationship with social media, affecting a significant minority of the global population. Understanding the disposition factors that influence PSMU is a crucial area of research (Sun & Zhang, 2021; Valkenburg, 2022).

Self-Determination Theory and PSMU

SM has evolved into a unique and important social context to meet relational and developmental needs, presenting opportunities and risks to well-being (Nesi et al., 2022). Self-determination theory (SDT)- an organismic-dialectical theory on human motivation- posits that individual functioning rests upon the interplay between organismic predisposition and social environment, and that self-regulation and well-being depend on the satisfaction of three universal and innate psychological needs: autonomy, which encompasses a sense of self-agency; competence, which pertains to the ability to act effectively in one's environment; and relatedness, which reflects the need for connection and belonging (Ryan et al., 2021). From an SDT perspective, SM are viewed as a compensatory medium that fulfils unmet psychological needs other than in-person interactions (Deci & Ryan, 2000). Empirical evidence indicates that SM platforms can offer beneficial need-experiences, but at the same time can also be need-depriving environments (West et al., 2024). Such environments that can support and thwart basic psychological needs may adversely affect well-being (Ryan et al., 2021); therefore, engaging with SM to compensate for need deficits may gradually become problematic (Chen et al., 2021).

According to the internet compensatory theory, relying on digital environments, like SM, to compensate for deficits in psychological needs in offline contexts increases dependency risks due to the intensity of use and the permanence that such compensation requires (Kardefelt-Winther, 2017). Research within the SDT framework supports this association of deficits in need satisfaction and PSMU in adolescents (Gugliandolo et al., 2020) and young adults (Masur et al., 2014), indicating that deficits in need satisfaction through offline interactions intrinsically motivate individuals to use SM to cope with the resulting distress, supporting the compensatory role of SM interactions (Gupta & Sharma, 2021). From this theoretical perspective, PSMU is operationalised as a dysfunctional coping mechanism arising from chronic or situational need frustration (Kuss & Griffiths, 2017; Vansteenkiste & Ryan, 2013). However, the increasing integration of SM into everyday life possibly indicates that SM no longer serve as a compensatory context for need satisfaction, calling for exploring the distinct effects of SM and offline interactions on mental health (Nesi et al., 2022).

Van de Casteele et al. (2024) investigated the separate and joint effects of need satisfaction in SM and offline contexts on the mental health of Belgian adolescents and young adults, providing a novel understanding of the interplay between the two domains. Findings indicated that need satisfaction is associated with mental health benefits, whereas need frustration correlated with adverse mental health outcomes, regardless of whether the needs were met online or offline, supporting SDT theory. Notably, separating offline from online need satisfaction revealed that offline environments emerged as the most decisive predictor of mental health, particularly for young adults. Findings suggest that those whose needs are frustrated in offline environments and rely predominantly or exclusively on online means to satisfy their needs are more vulnerable to adverse mental health outcomes. Although the outcome variables of Van de Casteele et al.'s (2024) study were mental health markers, like depression, research findings may indicate possible distinct associations between need satisfaction in SM and offline domains and PSMU. Such investigation represents a novel and intriguing exploration, advancing the current understanding of risk and

protective factors of PSMU by acknowledging the different needs-experiences in the two relational contexts.

Fear of Missing out and PSMU

Within the SDT framework, a significant driver for excessive SM engagement (Brown & Kuss, 2020) and a well-established vulnerability factor of PSMU is Fear of Missing Out (FoMo) (Oberst et al., 2017; Przybylski et al., 2013). FoMo is a complex phenomenon characterised by a perception of missing out on rewarding experiences and a persistent urge to remain connected with one's social network, indicating a problematic attachment to SM (Elhai et al., 2021). The seminal study of Przybylski et al. (2013) applied SDT to explore the psychological processes behind FoMo, conceptualising it as a self-regulatory limbo stemming from need deficits that drive individuals to engage excessively and compulsively with SM, as they are intrinsically motivated to stay continuously connected to what others are doing to alleviate their anxiety. In turn, SM use intensifies feelings of FoMo, as users are constantly exposed to extensive information about others' experiences, resulting in ongoing uncertainty about whether they are doing enough themselves (Oberst et al., 2017). Accumulated evidence supports FoMo as the most robust risk factor for PSMU in diverse populations (Tandon et al., 2021), on top of personality traits, attachment styles (Blackwell et al., 2017) and demographic groups (Saladino et al., 2024).

While SDT offers valuable insights into FoMo's motivational correlates, FoMo is a complex construct that a single theoretical framework may not fully capture its aetiology and effects on PSMU (Gupta & Sharma, 2021). For example, Groenestein et al.'s (2024) three-wave longitudinal study provided limited evidence for the SDT inference that deficits in psychological needs drive changes in FoMo over time, offering partial support for the self-regulatory limbo hypothesis (Przybylski et al., 2013). Additionally, the findings of Saladino et al.'s (2024) study in Italian young adults supported the positive association between need deficits and FoMO with PSMU; however, their partial mediation model suggested that the relationship of FoMo and PSMU is also intertwined with factors such as emotional regulation and social comparison. Similar findings are also reported in the Greek young adult population by the study of Dadiotis and Roussos (2024), indicating that FoMo, both directly and indirectly, predicts PSMU through the extent and intensity of SM usage while also correlating with negative affect, framing FoMo within an affective-regulatory context, emerging from an anxiety predisposition and sensitivity to social exclusion. These findings indicate that various psychological processes, beyond need deficits, underpin the development of FoMo, suggesting that integrating complementary theoretical perspectives might offer a more comprehensive understanding of FoMo's multifaceted nature (Elhai et al., 2021).

Generational Differences in PSMU

Notable generational differences exist in SM engagement regarding the amount of time spent on these platforms and the underlying motivations for their use (Kemp, 2024). Generation Z, born into the digital era, integrates SM seamlessly into their lives to meet their developmental needs, often engaging in constant connectivity (Nesi et al., 2022), whereas Generation X uses SM pragmatically, focusing on news and information, and Millennials prioritise personal and professional growth (Anand, 2023). These generational differences are reflected in age differences in PSMU rates, where adolescents are more vulnerable, followed by young adults and older age groups (Koçak et al., 2021). Orben et al. (2022) suggests that adolescence presents a developmental window of SM sensitivity, explaining why younger individuals are more vulnerable to PSMU.

Current study

Despite growing research on PSMU (Casale, 2020) empirical studies often lack a theoretical foundation, limiting their explanatory power (Sun & Zhang, 2021). Within the SDT framework, previous research explored the role of need satisfaction and FoMo in predicting PSMU (e.g. Saladino et al., 2024). However, as the SM environment is increasingly recognised as a unique context to cover psychological needs (Nesi et al., 2022), it is essential to investigate the differential relationship between need satisfaction in SM and offline domains with PSMU (Van de Casteele et al., 2024). Furthermore, most research has focused on Western cultures and the adolescent-to-university students demographic (Tandon et al., 2021), resulting in a lack of representation of older working adults (Tang et al., 2024) and collectivistic societies where vulnerability to PSMU may be heightened (Cheng et al., 2021). Finally, research on PSMU among Greek adults is quite limited (Dadiotis & Roussos, 2024). It is essential to focus on this population due to the unique cultural, societal, and economic factors that may influence SM use and PSMU in Greece (Gioltzidou et al., 2024).

The present study aims to address these gaps by examining individual differences in PSMU within the Greek adult population through the SDT framework (Ryan et al., 2021). More specifically, the study will investigate a predictive model of PSMU, exploring the unique associations of need satisfaction in both SM and offline domains, as well as the relationship between FoMo and PSMU. It is expected that (i) the levels of need satisfaction in the SM domain predict PSMU (two-tailed), (ii) the levels of need satisfaction in the offline domain predict PSMU (two-tailed), and (iii) higher levels of FoMo predict higher levels of PSMU (one-tailed).

This exploration aims to enhance the theoretical understanding of PSMU, contributing to the existing literature by providing insights into individual differences in PSMU among Greek working adults. The separate exploration of domain-specific associations of need satisfaction and FoMo with PSMU are expected to offer a nuanced understanding that can inform policymaking and intervention strategies. The goal is to promote healthier SM habits and mitigate the negative consequences associated with PSMU.

MATERIALS & METHODS

Design

This study employed a cross-sectional correlational design with a between-subjects component to examine the relationship between three predictor variables: need satisfaction during SM and offline experiences, both measured by the Basic Psychological Need Satisfaction in General Scale (Gagné, 2003), FoMo as measured by the Fear of Missing out Scale (Przybylski et al., 2013). The outcome variable, PSMU, was measured by the Bergen Social Media Addiction Scale (Andreassen et al., 2016). Potential confounding variables were examined through preliminary analyses and subsequently controlled for in the hierarchical regression. The materials section provides a detailed description of the questionnaires.

Participants

The study included 186 Greek adults aged 18–58 (M = 38.61, SD = 10.18) recruited through opportunistic and snowball sampling, targeting individuals with a potentially extensive network of future participants. Invitations to participate were emailed and posted on SM platforms (e.g., Facebook, LinkedIn) and university forums. No rewards were offered for participation. To qualify for inclusion in the study, participants needed to be over 18 years old, use at least one social media platform daily and possess a medium level of English literacy. Those currently experiencing severe mental health issues were strongly advised against participation. The sample's sociodemographic characteristics are presented in Tables 1.

Table 1. ***Mean (M) and standard deviations (SD) per sociodemographic group***

	N	%	M	SD
Gender				
Male	40	21.51	15.03	5.34
Female	146	78.49	13.83	5.29
Generational Cohort				
Generation Z	39	20.97	16.56	5.77
Millennials	86	46.24	13.86	5.03
Generation X	61	32.80	12.82	4.94
Ethnicity				
Greek	179	93.55	13.91	5.06
European	6	3.23	16.83	8.8.4
Other	1	.54		
Residence				
Urban	174	93.55	14.11	5.30
Rural	12	6.45	13.67	5.65
Educational level				
High School	10	5.38	14.60	6.69
University/College	81	43.55	14.53	5.00
Postgraduate studies	95	51.08	13.65	5.44
Employment status				
Student	21	11.29	16.76	5.82
Employed	143	76.88	13.90	5.21
Unemployed	10	5.38	12.10	6.24
Self-employed	12	6.45	13.33	3.50
Marital status				
Married	67	36.02	13.31	4.49
Single	72	38.71	14.04	5.41
In relationship	47	25.27	15.26	6.07

Materials

The study was administered through Google Forms, an online survey platform chosen for its accessibility, security and compatibility with smartphones and tablets. It has been validated in previous psychological research (e.g. Dadiotis & Roussos, 2024) and demonstrates comparable reliability to traditional paper-and-pencil measures (Daikeler et al., 2020). The questionnaire consisted of sociodemographic data, SM usage questions, the Basic Psychological Need Satisfaction in General Scale (Gagné, 2003), the Fear of Missing out Scale (Przybylski et al., 2013), and the Bergen Social Media Addiction Scale (Andreassen et al., 2016).

Sociodemographic characteristics. Sociodemographic variables included participants' age, gender, ethnicity (Greek, European, or Other), marital status (e.g., single or married), place of residence (urban vs. rural), educational level (e.g., high school or university), and employment status (e.g., student or employed).

Social media use. A brief self-report questionnaire was provided to gather information regarding participants' engagement with SM, based on previous studies (e.g. Dadiotis & Roussos, 2024). Participants were asked to indicate which SM platforms they use daily, their weekly average screen time, and the age at which they opened their first SM account.

The Bergen Social Media Addiction Scale. PSMU was measured by the total of the Bergen Social Media Addiction Scale (BSMAS), consisting of 6 items assessing the addiction symptoms of salience, mood modification, withdrawal, tolerance, conflict, and relapse. For example, "you spend a lot of time thinking about social media or planning to use it". Items are answered on a 5-point Likert scale (from very little (1) to very much (5)); thus, total

scores range from 6 to 30, with no reverse questions. Internal consistency has been reported with a Cronbach's alpha at .88 (Andreassen et al., 2016). Finally, BSMAS has been validated in the Greek adult population, with a reported internal consistency of .75 (Dadiotis et al., 2021). In the present sample, the internal consistency was at .82.

The Basic Psychological Needs Satisfaction Scale in General. Need satisfaction in the offline and SM domains was measured by the mean of two adjusted versions of the Basic Psychological Needs Satisfaction Scale in General (BPNS-G) (Gagné, 2003). The scale's original set of items was used; however, the wording of the introductory statement was domain-specific, based on Van de Casteele et al.'s (2024) study. The questionnaire consists of 21 items, nine of which are reverse questions, reflecting the degree to which an individual experiences satisfaction of psychological needs. For example, "I feel like I am free to decide for myself how to live my life". Items are answered on a 7-point Likert scale (from not true at all (1) to definitely true (7)). Scales internal consistency is reported at .89 (Gagné, 2003). The scale has not been validated in the Greek population. In the present sample, internal consistency was reported at .86 for the offline domain and .83 for the SM domain.

The Fear of Missing out Scale. The FoMo levels were measured by the mean of the Fear of Missing out scale (FoMoS). The questionnaire consists of 10 items that measure the construct across various life experiences, with no reverse-coded questions. For example, "I get anxious when I don't know what my friends are up to". Items are answered on a 5-point Likert scale (from Not at all True of Me (1) to Extremely True of Me (5)); thus, total scores range from 10 to 50. Internal consistency has been reported with a Cronbach's alpha of .88 to .90 (Przybylski et al., 2013). The scale was first utilised in a Greek adult sample by Dadiotis and Roussos (2024), where assessing internal consistency yielded a Cronbach's alpha of .83. In the present sample, internal consistency was found to be .80.

PROCEDURE

Data was collected online from December 2024 to January 2025 through email invitations, social media posts, and university forums. Before providing electronic informed consent, participants received an information sheet detailing the study's purpose, confidentiality, and voluntariness, which included a unique identifier for maintaining anonymity. The survey took about 10 minutes to complete. Upon completion, participants were presented with a debriefing document that reiterated their right to withdraw and contact information. Responses were submitted automatically online.

Ethical considerations

This study adhered to the British Psychological Society's Ethics Guidelines for Internet-mediated Research (2017) and received ethical approval from the University of Derby Research Ethics Committee at Mediterranean College in Athens, Greece. Participants were advised against participation if they had mental health concerns or felt that their involvement might negatively impact their well-being. They were directed to an online support platform in case they experienced any discomfort.

Analytical strategy

Since the survey was administered using Google Forms, participants were required to respond to all questions prior to submission; therefore, no handling of missing values was necessary. Participants were excluded from the analysis if they had typographical errors in their entries or reported screen time of less than one hour per week. A reliability analysis (Cronbach's Alpha) was performed to evaluate the internal consistency of all scales. The prevalence rate was calculated

using a liberal cutoff score of 19 or higher (Bányai et al., 2017). Before performing any analysis, the data were screened for parametric assumptions (Coolican, 2019). In the first phase, the main descriptive statistics were carried out. In addition, preliminary analyses were undertaken to investigate potential differences in PSMU across sociodemographic groups and SM usage, identifying potential confounding variables to control in the hierarchical regression. Subsequently, Spearman's rho correlations were calculated for all continuous variables to identify significant associations with PSMU and potential multicollinearity issues. Finally, hierarchical multiple regression was conducted to test the primary hypotheses while controlling for the variables identified in the preliminary analysis.

RESULT

Reliability Analysis

After conducting a reliability analysis, all scales demonstrated acceptable levels of internal consistency, as measured by Cronbach's alpha (BSMAS: $\alpha = .817$, $r > .2$, FoMoS: $\alpha = .804$, $r > .2$, BPNS-G offline: $\alpha = .858$, $r > .2$) except BPNS-G SM, where items 7R and 11R exhibited low item-total correlations and were sequentially removed to improve scale reliability (Field, 2018), resulting in an alpha of .847. These results confirm that the instruments used in the current study were psychometrically sound.

Prevalence rates

For the purposes of this study, a liberal cutoff score of ≥19 was adopted to measure sample PSMU prevalence (Bányai et al., 2017), which was reported at 22.04% The prevalence rates per sociodemographic group are presented in Tables 2.

Table 2: Prevalence rates of PSMU per sociodemographic group

	%
Total	**22.04**
Gender	
Male	25.00
Female	21.23
Generational Cohort	
Generation Z	38.46
Millennials	19.77
Generation X	14.75
Education	
Highschool	20.00
University	24.69
Postgraduate	20.00
Marital Status	
Married	17.91
Single	20.83
In relationship	29.79
Occupation	
Student	42.86
Employed	21.68
Unemployed	10.00
Self-employed	0

Although many scholars consider the endorsement of the midpoint cutoff to be too liberal (e.g., Gul et al., 2018), a more moderate classification helps identify at-risk populations who may benefit from early interventions, while stricter schemes may be more suitable for clinical diagnosis (Cheng et al., 2021).

Preliminary Analysis

Comparisons of sociodemographic variables

The independent samples t-test was used to examine gender differences in PSMU. Results indicated that female participants reported a mean PSMU of 13.83 (SD = 5.29), while males reported a higher mean PSMU of 15.03 (SD = 5.34). The difference was not statistically significant t (185) = 1.264, p=.208.

Likewise, one-way independent measures ANOVA were performed to assess differences in PSMU according to educational level, employment status, and marital status. These analyses indicated that there was no statistically significant main effect of educational level (F (2, 183) = .645, p=.526, two-tailed), employment status (F (2, 183) = 2.441, p=.066, two-tailed), and marital status, (F (2, 183) = 1.868, p=.156, two-tailed).

Correlational Analysis

The non-parametric Spearman's rho was used to examine the bivariate relationships between all the continuous variables to identify potential predictors and multicollinearity issues. The mean, standard deviation and correlations with coefficient intervals are presented in Tables 3.

Table 3: Means, standard deviations and correlations with coefficient intervals

Variable	M	SD	1	2	3	4	5	6	7	8
1. Age	38.61	10.18	1.00							
2. SM Accounts	2.80	1.07	-.06	1.00						
3. Screentime	2.86	1.62	-.26**	.06	1.00					
4. Age SM onset	23.95	8.98	.90**	-.11	-.20**	1.00				
5. PSMU	14.08	5.31	-.27**	.16*	.26**	-.28**	1.00			
6. FoMo	2.39	.71	-.28**	.10	.15*	-.33**	.49**	1.00		
7. BPNS_SM	4.75	.91	.00	-.03	.03	-.04	-.27**	-.23**	1.00	
8. BPNS_OFF	5.15	.86	.00	-.04	.13	-.03	-.21**	-.26**	.66**	1.00

Note: M and SD represent mean and standard deviation, respectively. * Indicates the correlation is significant at the .01 level (2-tailed). ** indicates a significant correlation at the .05 level (2-tailed).

All correlations with PSMU are significant; however, they are weak, except for FoMo, which demonstrates a moderate positive correlation with PSMU (r = .49, p < .001) (Coolican, 2019). Age demonstrated a strong positive correlation with age of SM onset (r=.90, p<.001), indicating potential multicollinearity issues if both variables were included in the multiple regression (Field, 2018).

As a result of the preliminary analysis, age and the number of SM accounts were included in Step 1 of the hierarchical multiple regression to control for the variance in PSMU attributable to these variables prior to testing the main predictors. Age was selected over the age of SM onset due to concerns regarding potential self-report errors with the latter. Although screentime was correlated with PSMU, it was excluded from further analyses due to severe violations of normality. As a self-report measure, it may contain significant reporting errors. Moreover, screentime is not theoretically central to the current study.

Hierarchical multiple regression

Results

A hierarchical multiple regression analysis was conducted in two steps to test the predictions. Step one involved controlling for age and the number of SM accounts. In step two, FoMo and need satisfaction in both SM and offline domains were included as predictor variables, with PSMU as the dependent variable. Table 4 presents the results of the hierarchical multiple regression.

Table 4 ***Hierarchical Multiple Regression Results for Problematic Social Media Use (PSMU)***							
Variables	**B**	**95% CI *B***		***SE* B**	**β**	***R²***	**ΔR^2**
		LL	***UL***				
Step 1						**.11**	**.11*** **
Constant	17.64	14.14	21.13	1.77			
Age	-0.15	-0.22	-0.08	0.04	-.29***		
Number of SM accounts	0.77	0.09	1.46	0.35	.16*		
Step 2						**.34**	**.23*** **
Constant	12.84	6.28	19.41	3.33			
Age	-0.09	-0.15	-0.02	0.03	-.17**		
Number of SM accounts	0.61	0.01	1.20	0.30	.12*		
FoMo	3.07	2.09	4.06	0.50	.41***		
Need Satisfaction SM	-1.23	-2.15	-0.32	0.46	-.21**		
Need Satisfaction offline	0.27	-0.72	1.25	0.50	.04		

Note. CI = confidence interval; LL = lower limit; UL = upper limit.
***p < .05. **p < .01. ***p < .001.**

The results showed that the first model (control variables) significantly predicted PSMU $F(2, 183) = 11.603$, $p < .001$. Age was significantly negatively associated (β=-.29, t = -2.637, df = 185, p = .009), and SM accounts were significantly positively associated (β=.16, t = 2.003, df = 185, p=.047) with PSMU. In the second model, the addition of the main predictors led to a statistically significant increase in effect size (ΔR^2 = .225), indicating that, together, FoMo, need satisfaction SM, and need satisfaction offline significantly predicted the levels of PSMU, $F(3, 180) = 20.379$, $p < .001$. FoMo was significantly positively associated (β=.41, t = 6.176, df = 185, p < .001), and SM were significantly negatively associated (β=-.21, t= -2.656, df = 185, p = .009) with PSMU. Finally, there was no significant relationship between need satisfaction offline and PSMU.

Overall, when age and SM accounts were included in the model, the variables explained 11.3% of the variance, a small effect (Cohen, 1988). The final model, including FoMo and need satisfaction in SM and offline contexts, accounted for 33.8% of the variance, a large effect size (Cohen, 1988). In the final model, results indicated that being younger, having more SM accounts, having higher FoMo levels, and having lower need satisfaction in the SM domain are associated with higher levels of PSMU.

Supplementary analysis

To enhance the interpretation of the results, a paired samples t-test was performed to compare need satisfaction in the SM and offline domains, despite normality violations, as Field (2018) emphasised the robustness of the t-test in large samples.

The results indicated that there was a significant difference in need satisfaction between the SM domain (M=4.75, SD=.92) and the offline domain (M=5.15, SD=.86), t (185) =-7.271, p<.001, two-tailed, d=-.44). A medium effect size (Cohen, 1988).

DISCUSSION

The purpose of this study was to gain a nuanced understanding of predictors of PSMU within the SDT framework, offering a dispositional and social environmental perspective of PSMU (Ryan et al., 2021). In addition to FoMo, the study examined the distinct associations between need satisfaction in SM and offline domains and the development of PSMU, providing one of the few examinations of PSMU within the Greek population and in older working adults.

The complete predictive model accounted for 33.8% of the variance in PSMU, indicating a large effect size (Cohen, 1988), which suggests that the model offers a substantial framework for understanding the predictors of PSMU. When generalised to the population, the adjusted R^2 (0.319) indicates a slight decrease in its predictive

power, explaining approximately 31.9% of the variance. Notably, the addition of FoMo and need satisfaction (SM and offline) yielded a statistically significant increase ($\Delta R^2 = .225$), indicating a substantial impact beyond the contribution of the control variables, which explained 22.5% of the variance- a small-to-moderate effect (Cohen, 1988). Age and the number of SM accounts accounted for a modest yet significant portion of the change in PSMU, explaining 11.3% of the variance and representing a small-to-moderate effect size (Cohen, 1988); however, gender and other sociodemographic and usage factors were not statistically significant. The findings suggest that dispositional factors, such as FoMo and social environmental factors, deficits in need satisfaction within the SM domain, explain unique variability in PSMU beyond age vulnerability and usage patterns. The results support the hypothesis that higher levels of FoMo (H3) and lower need satisfaction in the SM domain (H1) significantly predicted higher levels of PSMU. Contrary to expectations, lower need satisfaction in the offline domain did not significantly predict PSMU, not supporting H2. Furthermore, the supplementary analysis indicated that the levels of need satisfaction in the offline domain were significantly higher than in SM.

This pattern of results is broadly consistent with the study of Saladino et al. (2024), indicating that the levels of need satisfaction and FoMo predict the levels of PSMU, regardless of age and usage differences, supporting SDT perspective that self-regulation and well-being emerge from the interplay of dispositional factors and the social environment (Ryan et al., 2021). Specifically, the findings suggest that significant predictors of PSMU are both FoMo, an established dispositional trait (Przybylski et al., 2013), and need satisfaction in the SM domain, influenced by whether the experiences within the SM context support or thwart psychological needs (West et al., 2024). The present results also provided supporting evidence that FoMo is the most robust predictor of PSMU ($\beta = .41$, $p < .001$), consistent with previous studies within the SDT framework (Fioravanti et al., 2021; Saladino et al., 2024), and in the young adult Greek population (Dadiotis & Roussos, 2024); however, the relatively higher predictive strength of FoMo ($\beta = .41$, $p < .001$) compared to need satisfaction in SM ($\beta = –.21$, $p < .05$) indicates that FoMo might be additionally influenced by psychological processes beyond need satisfaction (Groenestein et al., 2024; Dadiotis & Roussos, 2024), suggesting a more complex picture of FoMo beyond need deficits (Przybylski et al., 2013).

Interestingly, by exploring need satisfaction in the SM and offline domains separately, the findings offer the first direct demonstration of a domain-specific link between need satisfaction and PSMU. Whereas Van de Casteele et al. (2024) found that need deficits in the offline environment have a greater impact on mental health indicators, the present study has shown that only need satisfaction in the SM domain significantly predicted PSMU. In contrast, the relationship between offline need satisfaction and PSMU was nonsignificant. This unexpected result is also inconsistent with SDT's core assumption and earlier studies (Gugliandolo et al., 2020; Masur et al., 2014), which suggest that unmet needs in real-life settings drive compensatory behaviours in SM to cope with associated distress and increase the risk of PSMU (Kardefelt-Winther, 2017).

The findings seem to offer a nuanced perspective of the compensatory mechanism (Vansteenkiste & Ryan, 2013), suggesting that what drives compensatory behaviours in the SM environment is not unmet psychological needs in real-life settings but low levels of need satisfaction within the same environment where the compensation occurs. Such associations seem to imply a vicious circle within the SM environment, where the need-depriving relational

experiences from SM engagement, such as feeling disconnected or inadequate, may lead to compulsive monitoring and a maladaptive relationship (Gupta & Sharma, 2021), increasing the risk of PSMU (Kardefelt-Winther, 2017). Therefore, PSMU is still conceptualised as a dysfunctional coping mechanism of negative affect (Kuss & Griffiths, 2017), which is an outcome of need-frustrating experiences within SM, though. The current findings seem not to support the role of SM as a complementary context for need satisfaction (Deci & Ryan, 2000) but rather as a separate environment offering unique and differentiated affordances for relational experiences, posing benefits and harms to well-being, such as the development of PSMU (Nessi et al., 2022).

Multiple factors require consideration to address this inconsistency. First, the supplementary analysis indicated that the levels of offline need satisfaction are significantly higher than in SM, in contrast to Van de Casteele et al.'s (2024) study, where both domains conveyed similar levels of need satisfaction. This might suggest that, regardless of how well basic psychological needs are met offline, individuals are vulnerable to developing PSMU if they do not adequately meet their needs in SM. Such findings might result from the study conducted in the Greek collectivistic culture, where in-person interactions and interdependence for social support are still prevalent (Gioltzidou et al., 2024). Furthermore, this significant difference in need satisfaction between domains might suggest a threshold effect (*Threshold Effects | Encyclopedia.com*, 2024), meaning that PSMU is not influenced until a certain level, or threshold, is reached in the level of need satisfaction. Therefore, this study's results may imply that the levels of need satisfaction in the offline domain (M=5.15) are not low enough to cause frustration from need deficits, whereas the levels in SM (M=4.76) are low enough to stimulate SM compensatory behaviours leading to vulnerability to PSMU. Exploring threshold effects in these variables represents a possible area of empirical investigation.

Second, the current study's outcome variable may play a role in the inconsistent findings compared to Van de Casteele et al. (2024), where the outcome was general mental health markers like depression and anxiety. Deficits in offline need satisfaction may be more impactful in broader mental health issues, while factors within the SM environment influence the development of PSMU. Such findings might support domain-specific risk factors, where individuals are more vulnerable to need deficits within the environments where they develop maladaptive usage patterns.

Another interpretation of the findings might be related to sample representation. In contrast with previous research focusing on the adolescent-to-university-student demographic (Tandon et al., 2021), this study represents working older adults with higher educational status. It may be inferred that the psychological predisposition to PSMU for this sociodemographic group differs from that of younger student populations. FoMo is found to be a significant predictor for this diverse group, supporting its conceptualisation as an intergenerational vulnerability factor (Tandon et al., 2021; Tang et al., 2024). On the other hand, results might indicate that for this population, alternative psychological mechanisms to need deficits underpin the phenomenon of FoMo (Gupta & Sharma, 2021).

Finally, the inconsistencies with previous studies within the SDT framework might reflect the changing nature of the SM environment. SM environment is constantly evolving, influenced by user preference, but also by algorithm content delivery and business models, implying that what motivates individuals to use and misuse SM is inevitably evolving, too, influencing psychological processes like FoMo and PSMU (Nesi et al., 2022). This highlights the challenge for scientific inquiry to keep pace with technological advancements to

understand their impact on mental health fully (Odgers & Jensen, 2020).

Some additional study results merit comment. Age was negatively correlated with PSMU, indicating that younger adults are more vulnerable, which is consistent with previous research (Koçak et al., 2021), supporting the developmental sensitivity hypothesis to PSMU (Orben et al., 2022) as well as differences in motives associated with SM use (Anand, 2023). Unlike previous research suggesting females might be more susceptible (Dadiotis & Roussos, 2024), the current study found no significant gender differences in PSMU, possibly reflecting changes in trends or cultural specifics (Cheng et al., 2021). The number of SM accounts was positively correlated with PSMU, consistent with the study of Dadiotis and Roussos (2024). Finally, the prevalence rate was 22.04% for the overall population sample, indicating that working adults are also at risk of PSMU; however, the positive skewness in PSMU suggests that these findings should be interpreted cautiously.

Study results should be interpreted in consideration of their limitations. The cross-sectional design limits causal inferences and the directionality of relationships, and reliance on self-report measures may introduce methodological biases, affecting ecological validity (Coolican, 2019). Additionally, while established scales were used, they lacked validation in the Greek population, except for the BSMAS (Dadiotis et al., 2021), and administering scales in English might have impacted comprehension for native Greek participants. Finally, the same scale (BPNS-G) was administered to measure domain-specific need satisfaction. However, developing district scales that capture differentiated need experiences in both domains is vital for more accurate results, which could be addressed in further research (Nesi et al., 2022).

Regarding sample limitations, the online recruitment method likely attracted participants who were comfortable with digital technology, leading to self-selection bias and underrepresentation of less experienced people with digital media. Furthermore, the opportunity and snowball sampling methods may have drawn individuals with higher levels of PSMU, as indicated by the variable's positive skewness, a common limitation in research on problematic behaviours (Bethlehem, 2010). Additionally, while sample included various generational cohorts, it did not adequately represent the socio-economic and educational diversity of the Greek population, limiting generalizability. Finally, the sample size provided a power of 99% (Cohen, 1988), it remains relatively small, suggesting the need for cross-validation with a larger sample and more robust sampling method.

Furthermore, normality violations, primarily due to the positive skewness of the PSMU measure, could affect the robustness of the findings despite adjustments, necessitating cautious interpretation. While excluding screentime was statistically justified, future studies should consider using objective measures to assess SM usage accurately. Additionally, the study's focus on the Greek adult population may limit the generalizability of the findings to other cultures or age groups.

Despite these limitations, the present findings suggest several theoretical and practical implications. First, the present study represents the first attempt to examine the domain-specific associations between satisfaction of basic psychological needs and PSMU. Findings indicated a within-domain compensatory mechanism for need deficits driving compulsive SM use and increasing vulnerability to PSMU (Vansteenkiste & Ryan, 2013), suggesting a nuanced perspective on the development of PSMU. Second, the relatively stronger predictive value of FoMo, as supported by the results of the current study, might indicate alternative psychological processes besides need deficits that drive the phenomenon (Gupta & Sharma, 2021). Further research examining an integrative

theoretical perspective may shed light on the complex nature of PSMU.

Finally, to the best of the author's knowledge, the present study is the first to simultaneously investigate FoMo and domain-specific need satisfaction, generally, and particularly in the Greek adult population, uniquely contributing to the existing literature by suggesting that PSMU is not affecting only the youth but also manifests across generations (Tang et al., 2024), with common and potentially alternative predictors. These sample characteristics provide ecological validity, as they examine predictors of PSMU in a real-world context of working, educated adults across generations within a specific cultural setting.

Findings have some potential intervention implications. The predictive model demonstrated that dispositional (e.g., FoMo) and environmental (e.g., domain-specific need-experiences) factors are significant predictors of PSMU, underscoring the importance of nuanced interventions that address individual vulnerability. Although the study did not address the relationship between screentime and PSMU the findings suggest that focusing interventions and preventive strategies on vulnerable individuals, rather than indiscriminately limiting screentime, would potentially be more beneficial (Odgers & Jensen, 2020). Furthermore, educational strategies to increase SM literacy to help individuals meet their psychological needs within the SM environment may offer a balanced approach to promoting healthy digital media engagement, emphasising the importance of internet literacy (Livingstone, 2014). Finally, findings show that working, educated adults are not immune to the adverse effects of SM engagement (Tang et al., 2024) have significant implications for potential interventions targeting individuals at risk and developing healthy digital engagement in the workplace.

Although these findings support a nuanced and theoretically grounded understanding of PSMU throughout the lifespan, their most significant contribution may be that they raise various intriguing questions. An essential area of further research might be exploring predictive models for each generational cohort and the distinct effects of the three basic psychological needs—relatedness, autonomy, and competence—on the development of PSMU. Scientific efforts have not yet answered the question about the nature of the relationship between SM use and adverse mental health outcomes, such as PSMU, which is also challenged by the changing nature of SM environment (Johannes et al., 2022) Therefore, participatory qualitative research may help capture the current experiences of SM users, including their unique voices and concerns, which may inform quantitative research efforts. Finally, longitudinal designs may shed light on the fluid nature of risk and protective factors associated with PSMU, accounting for within-person fluctuations (Nesi et al., 2022).

CONCLUSION

Despite its limitations, the present study advances the theoretical understanding of individual differences in PSMU within the Self-Determination Theory framework, emphasising the roles of dispositional factors such as FoMo and domain-specific need satisfaction. The findings offer a novel and nuanced understanding of the risk and protective factors associated with PSMU across generations, making a unique contribution to a growing body of evidence that indicates PSMU is a phenomenon that transcends age, gender, sociodemographic, and cultural boundaries. This reinforces the importance of ongoing research into diverse populations, the importance of tailored interventions and the need for future research to examine these dynamics across different cultures and demographic groups in various contexts.

Declaration by Authors

Ethical Approval: The research project received ethical approval from the Ethics Committee of the University of Derby at

Mediterranean College in Athens, Greece. The Committee adheres to the ethical guidelines established by the British Psychological Society (BPS) for research involving human participants.

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