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Association between psychosocial well-being and problematic social media use among Finnish young adults: A cross-sectional study

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ABSTRACT

The aim of the study was to identify associations between problematic social media use (PSMU), type of internet activity, various background factors, psychosocial factors (mood, fear of missing out, need to belong, social relationships) and the COVID-19-pandemic's impacts on social media use among young adults in Finland. Data were collected from 381 young adults aged 18–35 (M = 26.01; SD = 4.55) in Finland through a web-based survey conducted during the autumn of 2020. PSMU was identified using the Bergen Social Media Addiction Scale. Nine types of social media platform used were considered. Information about health-related factors was assessed using Beck Depression Inventory scale and a further single question. Social factors were measured using the Fear of Missing Out scale, the Single Item Need to Belong scale, and social engagement scale. 9.8 % of participants were found to exhibit PSMU. Younger people and women were more prone to PSMU. Social networking sites were the most used platform and were more strongly related to PSMU. Social media engagement, depression, fear of missing out and the effects of the pandemic on social media use were all positively and significantly associated with PSMU. These results may facilitate the development of guidelines for healthy social media use, and early detection of PSMU.

1. Introduction

Social media use, especially problematic social media use (PSMU), has become novel public health concern in recent years (Moretta et al., 2023). Social media and social networking sites (SNS) such as Instagram and Facebook have become an almost unavoidable part

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of young adults' daily lives (Lau, 2017) and devices such as smartphones have made them increasingly popular and accessible (Wright et al., 2021). Social media and SNS have become a way of being, shaping not only what we do but who we are and how we relate to each other (Kuss & Griffiths, 2017). Different types of social media platform provide many types of activities (e.g., chatting and socializing) (Obar & Wildman, 2015) and especially young adults use different social media channels to communicate with others (Kuss & Griffiths, 2017). Young adults have grown up in an era when digitalization has taken more role in our society and social media have developed at the same pace with them (Liu et al., 2021). In Finland the average young adult spends about 35–42 h online and 20 h on social media per week (Ebrand Group Oy, 2022).

There are over 4 billion social media users worldwide (Statista, 2022) and therefore it is not surprising that greater attention has been paid to the positive and potential negative impacts of social media use (Moretta et al. 2022). It has been estimated that the prevalence of PSMU is between 2.8% and 47%, percentages vary widely due to lack of consensus of a definition as well as variability of assessment tools used (Bányai et al., 2017).

There are ongoing debates in the literature about social media use and the extent to which it may be beneficial or harmful to well-being (Piteo & Ward, 2020). Some studies suggest that problematic use affects to young adults' psychosocial well-being negatively (e.g., Marttila et al., 2021; Andreassen et al., 2017) but there has been also debates that there is not enough evidence about the phenomenato generalize earlier research results and prove those associations correct (Obgers and Jensen, 2020; Orben & Przybylski, 2019). Previous studies have shown that use of social media can have both positive consequences for young adults' psychosocial well-being, for instance increasing social support (Lee et al., 2018) and social relationships (Décieux et al., 2019), but on the other hand some studies have indicated negative ones such as depression and loneliness (Faelens et al., 2021; Marttila et al., 2021; Reer et al., 2021).

At the beginning of the year 2020 The COVID-19-pandemic became a threating challenge globally and many countries, including Finland, adopt strong policies (e.g., lockdowns) to control infection. The COVID-19 had various impacts especially on young adults' lives and the pandemic has caused increase in social media use but also PSMU. (Alimoradi et al., 2022; Masaeli & Farhadi, 2021; Moretta et al., 2022). Earlier studies have indicated that epidemic-related stressors may have an impact on potential problematic behaviors and such behaviors could be seen as some sort of coping strategy for individuals to transfer their thoughts from anxiety and fear to other activities (e.g., social media) (Masaeli & Farhadi, 2021; Moretta et al., 2022). Also some survey studies have pointed out some possible links between social media use and young adults' mental health, such as depression and fear of missing out, during the pandemic (Liu et al., 2021; Ngien and Shaohai, 2021) and that the effect may be greater among female (Yoo & Jang, 2023). At the Finnish point of view the pandemic has affected to mental health problems negatively which is appearing for example increasing demand of the mental health services (Parikka et al. 2022).

In order to minimize the potential negative consequences of PSMU it is vitally important to understand the phenomenon in depth. There is little up-to-date information about PSMU in the Finnish population and no study to our knowledge has yet investigated PSMU and its associations to psychosocial well-being in Finland and how COVID-19-pandemic affected to young adults' social media use. This study was conducted to gain more empirical understanding and information about the phenomena among the Finnish young adults.

1.1. Aim of the study

Nevertheless, there is currently limited knowledge regarding potential associations between PSMU, psychosocial well-being (e.g., depression, FoMO, loneliness, social relationships) and COVID-19-pandemic implications to it among Finnish young adults. Therefore, the aim of the study was to identify associations between PSMU, type of internet activity, various background factors, psychosocial factors (mood, fear of missing out, need to belong, social relationships) and the COVID-19-pandemic's impacts on social media use among young adults in Finland. The objective is to produce new knowledge to use in health promotion and prevention of PSMU and be a step towards developing guidelines for healthy social media use.

2. Research background

2.1. Concepts of social media use and problematic social media use

Social media and SNS have been equated to each other although they are not the same thing (Kuss & Griffiths, 2017). SNS are a subcategory of social media (Kuss & Griffiths, 2017) that enable users to create public or private online profiles through which they can interact with others (Holland & Tiggemann, 2016; Kuss & Griffiths, 2017). Currently the SNS platforms most used by young adults are Facebook and Instagram (Faelens et al., 2021).

For some people, especially young adults, social media or SNS use can be so incessant that it becomes problematic (Griffiths et al., 2014; Hussain & Starcevic, 2020). Despite the growing numbers of studies investigating PSMU, definitions of problematic social media use are not yet systematic (Boursier et al., 2020; Moretta et al. 2022). Some studies of the condition have described it as a behavioral addiction and that some users potentially experience addiction-like symptoms (mood modification, salience, tolerance, withdrawal symptoms, conflict, and relapse) from their social media use (Bányai et al., 2017; Hussain & Starcevic, 2020). The use of social media is continued despite the negative consequences (Moretta et al. 2022). There has also been debate about implicating the previously used criterion for addiction when considering different kind of internet-based problematic behaviors (Charlton & Danforth, 2007) and there are no agreed criteria for defining PSMU (Moretta et al., 2022). For example, Charlton & Danforth (2007) suggested that it is inappropriate to use all the previously used criteria for addiction (e.g., tolerance and withdrawal) because they might indicate rather high

engagement than the frequency of internet-based problematic behaviors. In this study we use the term PSMU to describe such excessive use of social media, defining it as a state in which individuals' social media use is so uncontrollable that it causes negative effects to their well-being for instance disrupting their studies or social relationships (Andreassen, 2015; Błachnio et al., 2016).

2.2. Socio-demographics linked to social media use

People's life situation and phase of life are also influential to that how social media and SNS use affects to individual (Arampatzi et al., 2018; Marttila et al., 2021). Earlier research has pointed out some socio-demographic differences in PSMU (Kuss & Griffiths, 2017). Young adults (aged 18–35) generally use SNSs more than other age groups and are consequently more exposed to the specific effects of SNS use (Auxier & Anderson, 2021; Baumgartner et al., 2017; Faelens et al., 2021). Other risk factors identified for PSMU are found being female, having higher educational aspirations, and living in a nuclear family (Castrén et al., 2022). Taking into account the findings from earlier studies in the current study we studied various background factors (e.g., gender, age, education), time spend in social media, favorite internet activities (e.g., SNS use, gaming) and PSMU to examine possible associations between these variables.

2.3. Psychosocial issues arising from PSMU

The effects of the use of social media extend widely from individual to societal level and reasonable use is generally harmless. A theoretical framework which is currently commonly used in research on internet-based problematic behaviors (e.g., PSMU) is the Interactions of Person-Affect-Cognition-Execution (I-PACE) model (Brand et al., 2019). As proposed in the model individuals engage in PSMU because they use it to feel better (i.e., pleasure seeking). Individuals may end up in a cycle where they engage in social media to feel less negatively (i.e., cope with depressed mood) but on the other hand spending so much time in social media and SNS causes problems to their well-being. (Alimoradi et al., 2022; Moretta et al., 2023.) Despite the debate concerning PSMU, earlier studies have found associations between depression, social media engagement, the need to belong, fear of missing out (FoMO) and PSMU and problematic social networking site (PSNS) use (Alutaybi et al., 2020; Buglass et al., 2017; Kuss & Griffiths, 2017). FoMO is described as a desire to be continually connected with others and has been defined as a feeling that others might be having rewarding experiences from which one is absent (Przybylski et al., 2013). According to Ebrand Group Oy (2022) study some Finnish young adults felt that social media brings unwanted pressures (e.g., social pressure, FoMO) and even though social media brings happiness it may also cause negative feelings in life.

Psychosocial well-being includes a positive sense of identity and self-worth and sound family and peer relationships (World Health Organization (WHO), 2017). Seabrook et al., (2016) found that positive interaction, social support, and social connectedness on social media were associated with lower levels of depression, anxiety, and social comparison, while negative interaction on social media was associated with increased levels of depression and anxiety. For example, social interactions through social media could be more appealing first but in the long term less satisfying and unable to meet personal needs which leads to reduced well-being (Wright et al., 2021). For most of the young adults' social media and SNS provides social channels and brings an easy way for communication, but according to one Finnish survey almost 72% have also experienced unwanted behavior (e.g., isolation) in social media. (Ebrand Group Oy, 2022; Kuss and Griffiths, 2017.)

Depression has increased in recent years (Aalto-Setälä et al., 2021; Marttila et al., 2021) and loneliness is noted as a growing public health problem in industrial countries (Cacioppo & Cacioppo, 2018). The recent COVID-19-pandemic has affected young adults' health and well-being and increased their use of social media (Masaeli & Farhadi, 2021; Gao et al., 2020; Piteo & Ward, 2020). In addition, loneliness, mental health problems and challenges maintaining social relationships were some of the unintended consequences of physical distancing (e.g., lockdowns) (Li et al., 2023). Social media and SNS were the main channel to maintain social relationships during lockdown and to cope with stressors related to COVID-19-pandemic young adults sought peer interactions through social media (Masaeli & Farhadi, 2021; Ngien and Shaohai, 2021). This may have in turn led to an increase in internet-based problematic behaviors (Masaeli & Farhadi, 2021).

Mirroring to previous study results in the current study we studied PSMU, and different psychosocial factors related to it in Finnish perspective. We chose these particular factors because of their appearance in the earlier studies and because they comprise different psychosocial well-being indicators including psychological (e.g., depression) and social factors (e.g., loneliness, belongingness).

3. Materials and methods

3.1. Study design and data collection

This study used an explorative cross-sectional study design. Data were collected through a web-based survey of young adults in Finland, which was open during September-November 2020. Participants (n = 381) were recruited through an open announcement in national online journals and targeted communication via social media. The criteria for inclusion were: age (18–35); use of the Internet and social media; ability to respond to the survey in Finnish. Survey instructions were available on the research group's website and given at the start of the questionnaire.

3.2. Participants

381 people participated in the study. Their mean age was 26.01 years, and 80.6% were female. A detailed breakdown of

participants by background characteristics (gender, age, marital status, living arrangements, education, current education/employment status, favorite internet activity) is presented in Table 2.

The survey was accessed via hyperlink and participants were required to give their informed consent to participate on the landing page of the survey. Participation was voluntary and participants were able to withdraw from the study at any point.

3.3. Social media use

Validated measures are presented in the Table 1. PSMU was measured using the Bergen Social Media Addiction Scale (BSMAS) (Andreassen et al., 2016). BSMAS consists of six statements which reflect the core characteristics of addiction: salience, mood modification, tolerance, withdrawal, conflict, and relapse (Griffiths, 2005).

Social media engagement was measured using the Social Media Engagement Questionnaire (SMEQ) (Przybylski et al., 2013). BSMAS and SMEQ variables were transformed into a sum variable with higher scores indicating the likelihood of problematic social media and higher social media engagement.

Our questionnaire also included a question inviting participants to report their own use of social media as problematic: 'Do you think your use of social media has been problematic in the past 12 months?', with a yes/no response. Further questions asked about participants' favorite internet activities and the time spent on social media (hours per day).

3.4. Psychosocial wellbeing/factors

3.4.1. Depression symptoms

Depression was measured using the 6-item Beck Depression Inventory (BDI-6) scale which is a shorter version of the original BDI-21 questionnaire (Aalto et al., 2012; Beck et al., 1961). BDI-6 includes six multiple-choice items pertaining to depressed mood, pessimism, dissatisfaction, guilt, self-dislike and indecisiveness. The BDI-6 scores were transformed following the procedure established by Aalto et al., (2012) and higher scores indicate higher symptomatology.

3.4.2. Social wellbeing

Loneliness was measured with a single question: "Have you felt lonely during the past 12 months?" with responses measured on a 5-point Likert scale from 1 = Never to 5 = Constantly.

The question about satisfaction with social relationships was "How happy have you been about your social relationships during the past 12 months?". This was measured on a 5-point Likert scale from 1 = Very dissatisfied to 5 = Very satisfied.

Belongingness was measured by the Single-Item Need to Belong Scale (SIN-B) (Nichols & Webster, 2013) and The Fear of Missing Out Scale (FoMOs) (Przybylski et al., 2013) was used to measure participants fear of missing out.

3.5. Impacts of COVID – 19 – Pandemic

The questionnaire also included the question "How has the 2020 COVID-19-pandemic affected your use of social media?" which was measured on a 5-point Likert scale: 1 = "Significantly reduced usage", 2 = "Reduced usage a little", 3 = "No effect, use remained unchanged", 4 = "Increased usage a bit" and 5 = "Significantly increased usage".

Table 1
Validated measures which were used in the questionnaire.

Name	Measures	Items	Example of the questions	Scale	Cronbach's alpha	Cut-off score
Bergen Social Media Addiction Scale (BSMAS) (Andreassen et al., 2016)	Problematic social media use	6	"Used social media to forget about personal problems"	a 5-point Likert scale from 1 (very rarely) to 5 (very often)	0.83	19 out of 30 (Bányai et al., 2017)
The Social Media Engagement Questionnaire (SMEQ) (Przybylski et al., 2013)	Social media engagement	5	"How often did you use social media when eating breakfast?"	an 8-point Likert scale from 0 (Not one day) to 7 (Every day)	0.80	
the 6-item Beck Depression Inventory (BDI-6) (Aalto et al., 2012; Beck et al., 1961)	Depression	6	"I do feel sad"	5 statements (except for indecisiveness, which includes only 4), ranging from 0 to 3	0.84	
The Single-Item Need to Belong Scale (SIN-B) (Nichols & Webster, 2013)	Belongingness	1	"I have a strong need to belong."	a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree)	–	
The Fear of Missing Out Scale (FoMOs) (Przybylski et al., 2013)	Fear of missing out	10	"I fear others have more rewarding experiences than me"	a 5-point Likert scale from 1 (Not at all true of me) to 5 (Extremely true of me)	0.85	

Table 2
Background information on study participants.

Variable (dummy codes of the variables)	n	%	Mean (SD)
Gender	381		
Woman (1)	307	80.6	
Man (2)	59	15.5	
Other or I don't want to tell (3)	15	3.9	
Age (years)	381		26.01 (4.55)
Born in the 80 s (1)	66	17.3	
Born in the 90 s (2)	274	71.9	
Born in the 2000 s (3)	41	10.8	
Marital status	378		
Single (1)	160	42.0	
In a relationship (2)	79	20.7	
Married or cohabiting (3)	139	36.5	
Living arrangements	379		
Alone (1)	173	45.4	
Together with a partner (2)	125	32.8	
Together with a partner and a child/children (3)	28	7.3	
Together with a child/children (4)	3	0.8	
Together with one or many roommates (5)	31	8.1	
With parents or a parent (6)	19	5.0	
Highest educational attainment	381		
Primary school (1)	9	2.4	
High school (2)	123	32.3	
Vocational school (3)	53	13.9	
Bachelor's degree (4)	136	35.7	
Master's degree (5)	53	13.9	
Other (6)	7	1.8	
Current educational or employment status	381		
Working (1)	119	31.2	
Studying or studying and working (2)	225	59.1	
Out of working life or other (3)	37	9.7	
Favorite internet activity	370		
Social networking sites (e.g., Facebook, Instagram)	170	45.9	
Digital gaming (e.g., solo games)	28	7.6	
Gambling	1	0.3	
Adult entertainment (e.g., Pornhub)	0	0	
Online shopping	3	0.8	
Watching movies, documents or series	93	25.1	
Other video content (e.g., YouTube, vlogs)	46	12.4	
Dating services (e.g., Tinder)	1	0.3	
News and monitoring current events (e.g., e-magazines)	28	7.6	
Time spent on social media during a day (hours)			2.81 (2.58)

Note. SD = standard deviation. Sample sizes varied from 375 to 381 due to cases with missing values.

3.6. Data analysis

The data was analyzed using IBM SPSS Statistics version 27. Data from participants who did not wish to participate in the study were excluded from the analysis (n = 2). The data were checked for missing at random (MAR), missing completely at random (MCAR) and missing not at random (MNAR) values, with the cut-off for listwise deletion set at $\geq$ 5% missing values. Variables were dummy coded (Table 2). PSMS use, psychosocial well-being (depression, loneliness, social relationships, fear of missing out, need to belong), and participants' background data were analyzed using descriptive metrics (frequencies, percentages, averages and standard deviation (SD)). Factor analyses of the background variables are presented in Table 2.

Background variables, loneliness, social relationships, social media use during COVID-19-pandemic and self-reported problems with social media use were cross tabulated with responses to the BSMAS (Table 3). Correlations were evaluated using Spearman's correlation coefficient because the variables were not all normally distributed (Table 4). Correlation coefficients were calculated to assess the relationships between each pair of the study's variables.

Linear regression analyses were then performed with PSMU as the dependent variable and social media engagement, depression, fear of missing out, belonginess and time spent on social media as independent variables, to evaluate the relationships between them (Table 5). Other variables were left out because they were not dichotomous or continuous variables or were not suitable for this analysis. Preliminary analyses indicated that there was no violation of the assumptions of normality, linearity, multicollinearity (tolerance for all predictors was over 0.10 and VIF was under 5), and homoscedasticity. The level of significance was set at $p < 0.05$.

3.7. Ethics

Approval for the study was obtained from the Regional Ethical Commission of the North Ostrobothnia Hospital District.

Table 3
Cross-tabulation of the background variables and problematic social media use (BSMAS).

Variable	Not a problem with social media use		Problematic social media use		Total	p
	n	%	n	%	n	
Gender						0.66
Women	272	89.8	31	10.2	303	
Men	54	93.1	4	6.9	58	
Other or I don't want to tell	13	86.7	2	13.3	15	
Total	339	90.2	37	9.8	376	
Age						0.83
Born in the 80 s	60	90.9	6	9.1	66	
Born in the 90 s	244	90.4	26	9.6	270	
Born in the 2000 s	35	87.5	5	12.5	40	
Marital status						0.78
Single	141	89.8	16	10.2	157	
In a relationship	73	92.4	6	7.6	79	
Married or cohabiting	123	89.8	14	10.2	137	
Living arrangements						0.88
Alone	154	90.1	17	9.9	171	
Together with a partner	112	91.1	11	8.9	123	
Together with a partner and a child/children	24	85.7	4	14.3	28	
Together with a child/children	3	100	0	0	3	
Together with one or many roommates	27	87.1	4	12.9	31	
With a parent or parents	17	94.4	1	5.6	18	
Highest educational attainment						0.48
Primary school	8	100	0	0	8	
High school	110	89.4	13	10.6	123	
Vocational school	44	84.6	8	15.4	52	
Bachelor's degree	124	92.5	10	7.5	134	
Master's degree	46	88.5	6	11.5	52	
Other	7	100	0	0	7	
Current educational or employment status						0.76
Working	104	88.1	14	11.9	118	
Studying or studying and working	200	90.1	22	9.9	222	
Out of working life or other	35	97.2	1	2.8	36	
Loneliness						0.17
Never	25	86.2	4	13.8	29	
Very rarely	79	95.2	4	4.8	83	
Sometimes	135	91.8	12	8.2	147	
Quite often	75	86.2	12	13.8	87	
Constantly	25	83.3	5	16.7	30	
Social relationships						0.19
Very dissatisfied	9	90	1	10	10	
Quite dissatisfied	63	84	12	16	75	
Not satisfied or dissatisfied	45	88.2	6	11.8	51	
Quite satisfied	168	91.3	16	8.7	184	
Very satisfied	54	96.4	2	3.5	56	
COVID-19						0.003
Reduced use significantly	5	83.3	1	16.7	6	
Reduced use a little	13	72.2	5	27.8	18	
No effect, use remained unchanged	118	95.2	6	4.8	124	
Increased use a little	148	91.9	13	8.1	161	
Increased use significantly	55	82.1	12	17.9	67	
Self-reported problem with social media use						<0.001
Yes	63	67.7	30	32.3	92	
No	276	97.5	7	2.5	283	
Favorite internet activity						0.46
Social networking sites	147	87.5	21	12.5	168	
Digital gaming	25	89.3	3	10.7	28	
Watching movies, series and documents	85	92.4	7	7.6	92	
Other video contents	43	95.6	2	4.4	45	
News and magazines	26	92.9	2	7.1	28	

Note. Loneliness = Have you felt lonely during the past 12 months?; Social relationships = How happy have you been about your social relationships during the past 12 months?; COVID-19 = How COVID-19-pandemic has affected into your social media use; Self-reported problem = "Do you think your use of social media has been problematic in the last 12 months?"; p = statistical difference between variables.

Table 4
Descriptive data and correlation coefficients between study variables.

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1.Gender	–	–	–	–	–	–	–	–	–	–	–	–
2.Age	-0.011	–	–	–	–	–	–	–	–	–	–	–
3.BSMAS	-0.127*	-0.112*	–	–	–	–	–	–	–	–	–	–
4.SMEQ	-0.039	-0.172**	0.373**	–	–	–	–	–	–	–	–	–
5.BDI-6	0.078	-0.101	0.296**	0.149**	–	–	–	–	–	–	–	–
6.FoMO	-0.064	0.172**	0.488**	0.267**	0.249**	–	–	–	–	–	–	–
7.SIN-B	-0.163**	-0.033	0.187**	0.078	0.051	-0.0436**	–	–	–	–	–	–
8.Loneliness	0.081	-0.091	0.210**	-0.126*	0.557**	0.289**	0.082	–	–	–	–	–
9.Social relationships	-0.061	-0.044	-0.121*	-0.070	-0.515**	-0.047	0.007	-0.550**	–	–	–	–
10.Social media use	-0.048	-0.198**	0.311**	0.394**	0.188**	0.287**	0.133**	0.132*	0.012	–	–	–
11.COVID-19	0.024	-0.181**	0.279**	0.189**	0.108*	0.266**	0.160**	0.158**	0.060	0.210**	–	–
12.Social networking sites (e.g., Facebook, Instagram)	-0.067	0.024	0.022	-0.028	-0.026	0.037	0.114*	-0.052	0.019	-0.066	0.017	–
M	1.93	26.0	11.9	5.03	4.46	2.61	3.28	3.02	3.53	2.81	3.70	1.30
SD	0.527	4.55	4.86	1.86	3.81	0.801	1.23	1.04	1.05	2.58	0.872	0.910
Range	1–3	18–36	0–30	0–7	0–18	1–5	1–5	1–5	1–5	0–21.7	1–5	0–3
Items	1	1	6	5	6	10	1	1	1	1	1	1
Cronbach's Alpha	–	–	0.83	0.80	0.84	0.85	–	–	–	–	–	–

Note. M = mean; SD = standard deviation; BSMAS = Bergen Social Media Addiction Scale/problematic social media use; SMEQ = Social Media Engagement; BDI-6 = Brief 6-item Beck Depression Inventory; FoMO = Fear of Missing Out Scale; SIN-B = The Single-item Need to Belong; Loneliness = Have you felt lonely during the past 12 months?; Social relationships = How happy have you been about your social relationships during the past 12 months?; Social media use = Average social media usage (hours/day); COVID-19 = How COVID-19-pandemic has affected into your social media use; Social networking sites (e.g., Facebook, Instagram) = favorite internet activity; *p <.05, **p </= 0.001.

Table 5
Results from the regression analyses: social media engagement, depression, fear of missing out, belonginess and time spent in social media regressed on problematic social media use (BSMAS).

	B	SE	β	t	sig
SMEQ	0.570**	0.120	0.220	4.75	<0.001
BDI-6	0.213**	0.057	0.168	3.77	<0.001
FoMO	2.13**	0.305	0.353	6.98	<0.001
SIN-B	-0.040	0.186	-0.010	-0.217	0.829
Social media use	0.184*	0.085	0.098	2.16	0.031

Note $R^2 = 0.567$; B = unstandardized regression coefficient; SE = standard error; β = standardized regression coefficient; t = *t*-test statistic; SMEQ = Social Media Engagement; BDI-6 = Brief 6-item Beck Depression Inventory; FoMO = Fear of Missing Out Scale; SIN-B = The Single-item Need to Belong; Social media use = Average social media usage (hours/day); *p <.05, **p </= 0.001.

Participants received written information about the study and the principles of voluntary participation, and informed consent was obtained from them.

4. Results

A majority (80.6 %) were women and their ages ranged from 18 to 36 (M = 26.01; SD = 4.55) with most (71.9 %) born in the 1990 s. 42 % of the participants were single and most were living alone (45.4 %) or with a partner (32.8. %). Over half of the participants indicated that a bachelor's degree (35.7 %) or high school (32.3 %) was their highest educational attainment. Most participants (59.1 %) were studying and almost half (45.9 %) responded that their favorite internet activity was using social networking sites. On average participants spent 2.82 h per day on social media (SD = 2.58).

Cross-tabulation with chi-square comparison of the background variables and problematic social media use is presented in Table 3. In total 9.8 % of the participants had problems with social media use according to the measures used. Based on the descriptive data PSMU appears to be higher amongst some types of participants than others. It is higher amongst women (10.2 %) than men (6.9 %); younger participants (12.5 %); those who are single (10.2 %) or married/cohabiting (10.2 %); those living with a partner and children (14.3 %); those with a vocational education (15.4 %); those who are current working (11.9 %), and those who favor social networking sites over other internet activities (12.5 %). It is also higher amongst those who report loneliness constantly (16.7 %), quite often (13.8 %) and never (13.8 %), compared with those reporting more moderate levels; and it is higher amongst those who are quite dissatisfied with their social relationships over the past 12 months (16 %). However, none of these results are statistically significant.

The effects of the COVID-19-pandemic on participants' social media use were statistically significant (p =.003). In general, social media use increased during the pandemic. PSMU was reported more both by those who stated that their social media use had reduced a little (27.8 %) during the pandemic and by those stated that it had increased significantly (17.9 %). Statistically significant results were also found, interestingly, relating to those who self-reported a problem with their social media use; In total 92 answered this question 'yes', although only 32.3 % of them met the BSMAS criteria. Meanwhile 7 participants (2,5 %) who responded 'no' to this question still scored highly on the scale, suggesting that they do experience PSMU.

Table 4 presents mean scores and SDs for each of the study variables and their correlation coefficients. BSMAS was negatively and significantly correlated with gender (r = -0.039; p= <0.05) and age (r = -0.112; p = <0.05). Other background factors did not correlate with BSMAS use, so these were left out of the analysis.

BSMAS was positively correlated with SMEQ (r = 0.373; p = < 0.001), BDI-6 (r = 0.296; p = <0.001), FoMO (r = 0.488; p = <0.001), SIN-B (r = 0.187; p = < 0.001), loneliness (r = 0.210; p = <0.001), social media use (r = 311; p = < 0.001) and COVID-19-pandemic (r = 0.279; p = <0.001) and negatively correlated with social relationships (r = -121; p = <0.001). These findings were significant. BSMAS also correlated positively with the preference for social networking sites (r = 0.022).

The results of the regression analysis, in which social media engagement, depression, fear of missing out, belonginess and time spent on social media were regressed on PSMU are presented in Table 4. SMEQ (β = 0.220; p = <0.001), BDI-6 (β = 0.168; p = <0.001), FoMO (β = 0.353; p = <0.001) and social media use (β = 0.098; p = <0.031) were positively and significantly associated with PSMU. However, the effect size for time spent on social media use and PSMU was too small to interpret as hypothesis supportive. SIN-B was negatively associated with PSMU (β = -0.010), but the result was not statistically significant. Collectively, the independent variables of the final regression model explained 56.7% of the variance in PSMU ($R^2 = 0.567$; $R^{2\ \text{adjusted}} = 0.313$; F = 35.045; p < 0.001).

5. Discussion

The aim of the study was to identify associations between PSMU, type of internet activity, various background factors, psychosocial factors (mood, fear of missing out, need to belong, social relationships) and the COVID-19-pandemic's impacts on social media use among young adults in Finland. The results reveal that almost 10 % of participants experience PSMU, as measured by the BSMAS. PSMU was statistically and significantly associated with SNS use, age, gender, depression, social media engagement, fear of missing out, belongingness, loneliness, social relationships, and social media use during the pandemic. There is little up-to-date information about PSMU in Finland and the study results provided important knowledge about the phenomena among Finnish young adults. These phenomena appear as interrelated clusters and because of the nature of cross-sectional study, it is impossible to highlight cause-effect

relationships between studied factors and in the future, it would be beneficial to clarify these relationships. Still, it is important to have data and empirical evidence about the phenomenon from multiple studies, various methods and populations to have wider theoretical understanding and when considering potentially new phenomena which could possibly meet the criterion for addictive behaviors (Brand et al., 2022).

5.1. Association between the background factors and problematic social media use

Women were more prone to PSMU than men and the results are in line with earlier studies (Andreassen et al., 2017; Castrén et al., 2022). It has been shown that women are more vulnerable to developing addiction-like behaviors which involve social interaction (Andreassen et al., 2017), while men are more at risk of developing problems with gaming and gambling (Castrén et al., 2022).

Age was significantly related to PSMU with younger participants showing higher rates of PSMU. Earlier studies have shown that younger people use social media to maintain social relationships (Andreassen et al., 2017; Décieux et al., 2019), making them more likely to experience its negative effects (Baumgartner et al., 2017). Other background factors were not significantly associated with PSMU, but the results indicate that participants with a lower educational level (i.e., vocational education) have more problems with social media than participants with higher school degrees. This aligns with earlier findings (Andreassen et al., 2017).

Our study shows that relationship status and living arrangements have some bearing on PSMU although the findings are mixed. Aligning with previous studies (Andreassen et al., 2014, 2017) single people had higher scores and met the PSMU criteria rather frequently, but so did those who were married or cohabiting. Participants living with a partner and children, or roommates also had higher scores for PSMU. The results may be due to the fact that social media has become part of the daily lives of people of almost all age groups and the use is not so dependent on the life situation.

Also working full time was associated with PSMU in this study, but it is not in line with earlier studies which have found associations between PSMU and studying, unemployment and being economically inactive (Andreassen et al., 2017; Wheatley & Buglass, 2019). One explanation of this may be that technology and social media have become important tools for studying and work as well as daily life (Lau, 2017).

The study results revealed that we should notify different risk factors (e.g., gender) and possible profiles when we are considering PSMU. Most of the Finnish young adults also feel that it is important have teaching about the healthy use of social media in educational institutes (Ebrand Group Oy, 2022) and these preliminary findings can be used to targeting information to the possible risk groups.

5.2. Measured vs. self-perceived problematic social media use

Nearly half of the participants who favored SNS use over other online activities reported more problems with social media use. Earlier studies have indicated that problems with social media use are associated with SNS use in particular (Griffiths et al., 2014; Kuss & Griffiths, 2017).

A particularly interesting finding concerns participants' own perception of having problems with their social media use. About a quarter of the participants felt that they had a problem with social media use, but only half of this group met the threshold of PSMU based on the BSMAS. Drawing parallels with the field of online gaming, where there is a criterion for hazardous gaming which often precepts the development of gaming disorder. There has been debate whether it is appropriate to include the gaming disorder as a mental health problem (e.g., Aarseth et al., 2017) however it was included in the 11th Revision of the International Classification of Diseases (ICD-11) as "disorders due to addictive behaviors". (World Health Organization (WHO), 2020.) Our finding raises the question of whether, without appropriate intervention, these participants are at risk of developing more serious problems with social media use. It may also be that perhaps the BSMAS scale is not accurate enough to identify/detect individuals who are at risk of developing PSMU. It is worth noting that there were also a few participants who did not feel that they had a problem with social media but still scored highly on the BSMAS. Concluding the results we need also more objective information when considering PSMU. Comparing the subjective experiences with the objective use would be beneficial when developing a scale to identify PSMU.

As earlier noted, there is no clear definition or diagnostic criteria for PSMU and defining what kind of social media use is problematic is challenging. It is also important to take concern that social media use has multiple positive effects to well-being (e.g., Lee et al., 2018; Décieux et al., 2019) and not over stigmatize social media use, SNS use or users. The results also support that we need clearer definitions for PSMU in the future so we could understand peoples' experiences more specifically. Also qualitative studies considering the peoples' understanding about the phenomena would be beneficial.

5.3. Psychosocial factors associated with problematic social media use

Higher level of PSMU was associated with depression, reflecting earlier findings by Hussain and Griffiths (2018). It is known that PSMU and PSNS use tend to reflect the presence of specific risk and protective factors, including individual factors such as personality traits, psychological and contextual factors such as online and offline relationships (Castrén et al., 2022; Hunt et al., 2018; Piteo & Ward, 2020). Seabrook et al. (2016) have suggested that social comparison and negative interaction on SNS could relate to higher levels of depression and whether the effects is beneficial or detrimental depends possibly on the quality of social factors (e.g., social support, interaction) in social media and SNS.

Furthermore, both the most and the least lonely participants had higher rates of PSMU than others. This may mean that people who feel lonely use social media and SNS more, but those who are socially more active also use these channels (Bano et al., 2019; Wright et al., 2021). Earlier studies have found that active and passive SNS use have different effects on people's well-being (Bano et al., 2019;

Roberts and David, 2022). Excessive SNS use has a negative impact on social well-being and social connection particularly when the use is passive (e.g., viewing other user's profiles without interacting) but a positive impact when the use is active (e.g., interacting with other users) (Roberts and David, 2022).

Our study found that engaging with social media more and higher fear missing out were associated to PSMU. Przybylski et al., (2013) suggest that those who strongly feel that they are missing out for something important (i.e., high scores in FoMO – scale) gravitate towards social media use, which may explain why we found that they have more problems with social media use. Our study also found a negative association between PSMU and social relationships, meaning that those who are less satisfied with their social relationships are at greater risk of PSMU, as found earlier (Andreassen et al., 2016). Marttila et al. (2021) suggest that there are clear negative impacts of PSNS use on social relationships, and that increased PSNS use predicts increased loneliness which in turn predicts decreased life satisfaction. Lonely people may use digital technologies in ways that do not promote new social relationships and as an escape from the social world, thus perpetuating loneliness. On the other hand, when SNS are used to enhance existing relationships and build new social relationships the effect is opposite. (Marttila et al., 2021; Nowland et al., 2018.).

5.4. Social media use and the COVID-19-pandemic

This study found a positive association between PSMU and the effect of the pandemic on social media use. According to this study results most participants' use of social media increased during the pandemic, to almost three hours per day. Associations between time spent on social media and PSMU were too small to be interpreted significant. Effect sizes in this routine may be due to methodological noise and cannot be interpreted as meaningful (Ferguson & Heene, 2021).

The pandemic may have increased social media and SNS use because lockdowns limited social interaction to online environment (Thygesen et al., 2021). Some studies have highlighted growing evidence that it is the quality rather than quantity of social media and SNS interactions which determine how social media use impacts on young adults' well-being (Marciano et al., 2022.). Factors such as motivation, number of platforms used and amount of time spent on social media clearly influence how it affects people's well-being (Vally & D'Souza, 2019; Wright et al., 2021).

Based on the current study results we can gather that most likely participants use social media, especially SNS because it was the favorite internet activity, to communicate with peers during the pandemic. In additionally our findings partly supports earlier studies which indicated the increased use of social media during the pandemic was associated to younger age, social media engagement, increasing depression levels, FoMO, belongingness and loneliness (Liu et al., 2021; Ngien and Shaohai, 2021). This study results may support I-PACE model and theory which have suggested that social media and SNS may be a coping method to deal with negative emotions (e.g., depression, FoMO) during different kind of crises in life (e.g., pandemic) (Masaeli & Farhadi, 2021; Moretta et al., 2022). The way people use social media and SNS may be central to understanding the relationships between psychological and background factors and PSMU use in the future.

5.5. Guidelines for healthier social media use

This study has pointed out several potential factors that should be considered when developing guidelines for healthier social media use; 1) purpose of the use, 2) content, 3) interaction, and 4) education. The guidelines should take concern possible risk factors (e.g. gender, age). The goal is not to eliminate the use entirely but rather to guide for healthier use.

First, it is important to pay attention to reasons to use social media. Health care professionals or the users themselves should consider whether there is specific reason for the use (e.g., maintain social relationships, escaping negative feelings, loneliness). From the study results we can gather that scales may not be accurate enough to recognize PSMU so it would be beneficial to find out the user's experiences towards the social media use. If user experiences that the use is problematic it would be easier to identify the reasons behind the use and tackle the issues that may decrease well-being.

Second, social media users should be aware of the content in social media. Attention should be paid to whether the use is only passive scrolling or active interaction in different channels. It is also good to understand the nature of social media and the functioning of algorithms because disturbing content can negatively affect well-being.

Third, social media use should foster positive interactions with others, and it is especially important to consider social factors which are associated with PSMU. Negative comparison with others in social media could cause feelings of isolation and missing something out. To tackle the possible negative effects, it is important to pay attention to the quality of the interactions and have also some breaks from social media and SNS.

For the last, the competence of risk groups and professionals (e.g., in healthcare, education) about the healthy social media use is needed to develop by educational interventions so that they are able to identify PSMU signs at an early stage.

5.6. Limitations and future directions

This study is one of the first studies investigating PSMU in the Finnish population. There are some limitations which are important to take into account. The research was conducted only in Finland which could affect to generalizability, but the research results are indicative for other developing countries where social media have become part of the culture. Consequently, more representative samples are needed to confirm (e.g., to reduce a chance for Type II errors) these preliminary findings. It is recommended that effect sizes below $r = 0.10$ should not be interpreted as hypothesis supportive (see Ferguson & Heene, 2021). Also, the cross-sectional design means that it is not possible to draw conclusions about causality based on the associations we have identified. The use of a self-

reporting survey may have biased the results, therefore caution is needed when interpreting the results.

Interpretation of the results is also challenging because this study does not consider participants' parallel use of the internet for different purposes: for instance, SNS use was the most popular first choice online activity, but it was also many participants' second choice. A more sophisticated analysis would be possible if parallel uses of the internet had been measured differently and separately.

The results about the prevalence of the PSMU should be considered with caution. The sample was not randomized and further there has not been reached a consensus on the conceptualization and diagnostic criteria of PSMU. There is a need to develop validated measures which are specifically designed to measure SNS use. More data on actual use rather than self-reported use would also be valuable because it would help to clarify which functions and applications have positive or negative consequences for well-being. More specific methods for identifying and assessing PSMU, which can better distinguish between different problematic activities, are needed both for research and practice. Longitudinal studies about the phenomenon of PSMU are also needed.

At present there are no early interventions available to detect PSMU or users who are at risk of developing the problem and in the future, we need more studies considering the topic. Therefore it is utmost important to enhance public awareness about problematic use and possible negative consequences related to it. Our findings give an insight which kind of associations could be between PSMU and psychosocial well-being among Finnish population. This would help users to identify possible symptoms, modify the use themselves or seek support and help at an early stage. Because young adults spend so much time in social media channels and use SNS it is important to be aware how it might affects to one's own well-being. Our findings could be indicatively used for detecting PSMU and may also be used: in educating relevant professionals, e.g., in schools and health care settings, and; health promotion for young adults.

6. Conclusions

Overall, the present study suggests that there is an association between PSMU and psychosocial factors. 9.8% of our sample reported experiencing PSMU, though this should not be necessarily interpreted as a clinical condition. PSMU was more common among women and younger participants. Those who were more dissatisfied with their social relationships, felt more depressed, and had higher fear of missing out also had greater problems with social media use. The COVID-19-pandemic increased participants' social media use and was associated with problematic use. In the future research should pay attention to the purposes and which way young adults are using social media. Finally, 67.7 % participants perceived themselves to have a problem with social media use although only half of this group met the threshold based on the Bergen Social Media Addiction Scale. Future research should pay attention also to this group who might be in a risk group for developing the problem and from the perspective of opportunities for prevention of more serious problems. Also future research is needed to develop more accurate scales to identify the problematic use more specifically.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability

The data that has been used is confidential.

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