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## Research paper

# Coronavirus (COVID-19) outbreak: Addictive social media use, depression, anxiety and stress in quarantine – an exploratory study in Germany and Lithuania

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## ABSTRACT

**Background:** To slow down the spread of the COVID-19 pandemic, governments of many countries introduced various behavioral measures starting March 2020. The measures included domestic quarantine (not leaving home) for infected or potentially infected people. Due to the need for social distancing, online activity increased in spring 2020. This could foster the risk for addictive social media use (SMU). The present study investigated tendencies of addictive SMU and their relationship with depression, anxiety and stress symptoms specifically among individuals who stayed in domestic quarantine due to COVID-19 in Germany and Lithuania.

**Methods:** In Germany ( $N = 529$ ; quarantine group:  $n = 157$ , non-quarantine group:  $n = 372$ ) and in Lithuania ( $N = 325$ ; quarantine group:  $n = 54$ , non-quarantine group:  $n = 271$ ), data were assessed via online surveys in spring 2020.

**Results:** In both countries, persons in quarantine had higher levels of addictive SMU, depression, anxiety and stress symptoms than individuals who were not in quarantine. The difference was significant only for addictive SMU in the German sample. The significant positive correlations between addictive SMU and symptoms of depression, anxiety and stress were stronger in both quarantine groups than in the non-quarantine groups.

**Limitations:** The mostly female, young and well-educated composition of both investigated samples limits generalizability of the current findings.

**Conclusions:** Results reveal first evidence that the use of social media during domestic COVID-19 quarantine might contribute to the increase of addictive tendencies and negatively impact well-being. Alternative ways of daily routine during the quarantine are discussed.

## 1. Introduction

The outbreak of the coronavirus disease 2019 (COVID-19; severe acute respiratory syndrome coronavirus 2, SARS-CoV-2) in Winter 2019 and its rapid spread affected the life around the globe (World Health Organization, 2020). The number of confirmed cases of COVID-19

enhances daily (<https://www.worldometers.info/coronavirus/>).

To slow down the spread of COVID-19, the governments of many countries declared national lockdown and restricted everyday life starting March 2020 (Gandhi and Rutherford, 2020). The governmental measures included temporary closure of schools, universities and non-essential businesses, increased work-from-home orders and

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**Table 1**  
Demographic data of the German sample and the Lithuanian sample (quarantine vs. non-quarantine).

	German sample, N = 529		Lithuanian sample, N = 325	
	Quarantine, n = 157	Non-Quarantine, n = 372	Quarantine, n = 54	Non-Quarantine, n = 271
Age, M (SD)	25.82 (5.63)	27.52 (7.81)	19.70 (2.38)	19.45 (0.97)
Gender, % (n)				
Women	78.3 (123)	75.3 (280)	79.6 (43)	80.8 (219)
Men	21.7 (34)	24.7 (92)	20.4 (11)	19.2 (52)
Occupation, % (n)				
Students	73.2 (115)	61.6 (229)	100 (54)	100 (271)
Employees	26.8 (42)	38.4 (143)		

Notes. M = mean; SD = standard deviation; % = frequency.

virtual-schooling, canceling of large-group events, and total “stay-at-home” orders (Sohrabi et al., 2020). The time between exposure to the virus and symptom onset ranges between two and 14 days. Therefore, persons who were positively tested for or have symptoms of COVID-19, but are not hospitalized, and those who were in direct contact with someone who was positively tested/has symptoms are advised to stay in domestic quarantine (not leaving home) for at least two weeks (World Health Organization, 2020).

The need for physical isolation specifically of people in quarantine contributed to enhanced use of online social media (SM) such as Facebook and Twitter to stay in contact with family and friends (Depoux et al., 2020; Gao et al., 2020), and to get updates about the current COVID-19 situation (Pennycook et al., 2020). However, intensive social media use (SMU) could negatively impact subjective well-being (Twenge and Campbell, 2019). It could contribute to the development of an emotional bond to SM that is linked to a strong addictive need to stay permanently online – a phenomenon termed as addictive SMU (Andreassen et al., 2017). Addictive SMU is defined by six typical characteristics (Andreassen et al., 2017; Griffiths, 2005): salience (i.e., permanent thinking about SMU), tolerance (i.e., heightened amounts of SMU are required to attain positive effect), mood modification (i.e., mood improvement by SMU), relapse (i.e., reverting to higher amounts of SMU after unsuccessful attempts of its reduction), withdrawal symptoms (i.e., becoming nervous without SMU), and conflict (i.e., interpersonal problems caused by intensive SMU). Previous longitudinal research described enhanced levels of the addictive tendencies to positively predict insomnia and suicide-related outcomes (i.e., suicide ideation, suicide attempts) (Brailovskaia et al., 2019a, 2020b).

Extraordinary uncertain situations can cause an emotional overload and enhance symptoms of depression, anxiety and stress (Bonanno et al., 2010). Individuals with high levels of the symptoms often lack adequate coping strategies. Therefore, they tend to escape into the online world to gain positive experiences and to at least temporarily forget the negative ones (Marino et al., 2018). This, however, could contribute to the development of addictive tendencies that in the longer-term might further enhance the negative symptoms (Atroszko et al., 2018; Brailovskaia and Margraf, 2017). The COVID-19 situation is extraordinary in

many ways. Since the pandemic outbreak, the number of infected cases raises daily. In spring 2020, there were no medication and anti-COVID-19 vaccines, the everyday life was extremely restricted particularly for individuals in quarantine, and there was an uncertainty about the duration of this situation (Sohrabi et al., 2020). Thus, the COVID-19 situation offered a unique possibility to investigate whether the use of SM during physical isolation and the permanent stay at home could be risk factors for addictive SMU. This knowledge could be used for the screening purpose of addictive online behavior and the development of prevention programs.

Against this background, the present study aimed to compare the levels of addictive SMU, depression, anxiety and stress symptoms of individuals who are in domestic quarantine due to COVID-19 and those who are not in quarantine. Considering the exceptionality of the COVID-19 situation and the lack of earlier research, to avoid speculations, research questions were formulated instead of hypotheses:

Does the level of addictive SMU differ between individuals in quarantine and not in quarantine? (Research Question 1)

Does the level of depression, anxiety, and stress symptoms differ between individuals in quarantine and not in quarantine? (Research Question 2)

Moreover, it was investigated exploratorily whether the association between addictive SMU and the symptoms of depression, anxiety, and stress differs between individuals in quarantine and not in quarantine.

The extent of the COVID-19 spread differs between the affected countries. To investigate whether the extent of the spread can influence the investigated result pattern, the present samples were collected in Germany (beginning of April 2020: confirmed COVID-19 cases: >127.000, recovered: >64.000, deaths: >3.000) and Lithuania (beginning of April: confirmed COVID-19 cases: 1.062, recovered: 101, deaths: 24) that are affected by COVID-19 differently strong (<https://www.worldometers.info/coronavirus/>). In both countries, similar restrictions of everyday life started in March 2020 (Government of the Republic of Lithuania, 2020; Robert Koch Institut, 2020).

## 2. Methods

### 2.1. Procedure and participants

In both countries, data were collected from the end of March to the beginning of April 2020 by e-mailed invitations that included the link to the online survey provided, respectively, in the national language. The invitation was sent to a randomly selected group of individuals who are current or former students of a large university in the Ruhr region (Germany) or in Vilnius (Lithuania). They all had previously agreed to be contacted for research investigations. Table 1 shows the participants' demographic data.

**German sample.** Of the 529 participants (invited: 700 persons), 29.7% (n = 157) were currently in quarantine (days of quarantine: M (SD) = 9.83 (7.69), range: 2–44).

**Lithuanian sample.** Of the 325 participants (invited: 1,710 persons), 16.6% (n = 54) were currently in quarantine (days of quarantine: M (SD) = 17.20 (3.66), range: 7–30).

Notably, the German sample (quarantine and not-quarantine) was

**Table 2**  
Descriptive statistics and internal reliability of investigated variables in the German sample and in the Lithuanian sample (quarantine vs. non-quarantine).

	German sample, N = 529				Lithuanian sample, N = 325			
	Quarantine, n = 157		Non-Quarantine, n = 372		Quarantine, n = 54		Non-Quarantine, n = 271	
	M (SD)	$\alpha$	M (SD)	$\alpha$	M (SD)	$\alpha$	M (SD)	$\alpha$
Addictive SMU	11.86 (4.87)	.83	10.45 (3.99)	.79	14.59 (5.41)	.82	14.23 (4.85)	.80
Depression	4.80 (4.64)	.89	4.40 (4.15)	.88	8.04 (5.88)	.91	6.30 (5.06)	.89
Anxiety	2.76 (3.30)	.78	2.34 (2.93)	.76	4.83 (4.31)	.80	4.07 (4.09)	.82
Stress	6.57 (5.08)	.90	6.24 (4.41)	.86	8.72 (5.39)	.89	7.93 (5.13)	.88
DAS	14.13 (11.35)	.93	12.98 (9.84)	.92	21.59 (13.45)	.94	18.30 (12.94)	.93

Notes. M = mean; SD = standard deviation;  $\alpha$  = Cronbach's  $\alpha$ ; SMU = social media use; DAS = depression, anxiety, stress.

**Table 3**  
Hierarchical regression analyses (outcomes: addictive social media use, symptoms of depression, anxiety, and stress; German sample).

	$\beta$	95% CI	T	Adjusted R <sup>2</sup>	Changes in R <sup>2</sup>
<b>Addictive Social Media Use</b>					
Step 1, F(3,525) = 8.652, p < .001					
Age	-0.194**	[-0.189, -0.061]	-3.847	0.042	0.047
Gender	-0.077	[-1.627, 0.073]	-1.795		
Occupation	-0.008	[-0.970, 0.822]	-0.163		
Step 2, F(4,524) = 8.770, p < .001					
COVID-19 Quarantine	0.126**	[0.400, 1.981]	2.957	0.056	0.016
<b>Depression Symptoms</b>					
Step 1, F(3,525) = 1.727, p = 0.160					
Age	-0.106*	[-0.133, -0.003]	-2.063	0.004	0.010
Gender	0.005	[-0.817, 0.910]	0.106		
Occupation	0.015	[-0.774, 1.045]	0.293		
Step 2, F(4,524) = 1.434, p = 0.221					
COVID-19 Quarantine	0.033	[-0.501, 1.118]	0.749	0.003	0.001
<b>Anxiety Symptoms</b>					
Step 1, F(3,525) = 0.381, p = 0.767					
Age	-0.045	[-0.066, 0.026]	-0.864	-0.004	0.002
Gender	-0.009	[-0.675, 0.553]	-0.196		
Occupation	-0.001	[-0.655, 0.639]	-0.024		
Step 2, F(4,524) = 0.722, p = 0.577					
COVID-19 Quarantine	0.058	[-0.189, 0.961]	1.320	-0.002	0.003
<b>Stress Symptoms</b>					
Step 1, F(3,525) = 1.510, p = 0.211					
Age	-0.007	[-0.074, 0.065]	-0.129	0.003	0.009
Gender	-0.068	[-1.661, 0.195]	-1.552		
Occupation	0.064	[-0.360, 1.595]	1.240		
Step 2, F(4,524) = 1.319, p = 0.262					
COVID-19 Quarantine	0.038	[-0.487, 1.252]	0.865	0.002	0.001
<b>DAS Symptoms</b>					
Step 1, F(3,525) = 0.675, p = 0.567					
Age	-0.060	[-0.249, 0.063]	-1.169	-0.002	0.004
Gender	-0.031	[-2.826, 1.331]	-0.706		
Occupation	0.034		0.668		

**Table 3 (continued)**

	$\beta$	95% CI	T	Adjusted R <sup>2</sup>	Changes in R <sup>2</sup>
		[-1.446, 2.936]			
Step 2, F(4,524) = 0.802, p = 0.524					
COVID-19 Quarantine	0.048	[-0.870, 3.025]	1.087	-0.002	0.002

Notes. N = 529; COVID-19 = coronavirus disease 2019; DAS = depression, anxiety, stress;  $\beta$  = standardized coefficient beta; CI = Confidence Interval; in each step of the regression analyses, only new included variables are presented. \*\* p < .01. \* p < .05.

older than the Lithuanian sample (quarantine and not-quarantine). The gender distribution was similar in both samples. They included more female than male participants. While in the German sample, about two-thirds of the participants were students and about one-third were employees, the Lithuanian sample included only students (see Table 1). In both countries, participation was voluntary. The responsible Ethics Committee in both countries approved the present study. All participants were properly instructed and gave online their informed consent to participate. All data sets were complete. No data sets were excluded.

**2.2. Measures**

**COVID-19 Quarantine.** Participants rated whether they are currently in domestic quarantine (0 = no; 1 = yes).

**Addictive SMU.** The brief version of the Bergen Social Media Addiction Scale (BSMAS; Andreassen et al., 2017) assessed addictive SMU with six items (e.g., “Felt an urge to use social media more and more?”) according to the six core features that are rated on a 5-point Likert-type scale (1 = very rarely, 5 = very often). Higher sum scores indicate higher levels of addictive SMU.

**Depression, Anxiety, Stress.** Symptoms of depression, anxiety and stress were measured with the Depression Anxiety Stress Scales 21 (DASS-21; Lovibond and Lovibond, 1995). The DASS-21 includes, respectively, seven items per subscale (e.g., depression subscale: “I couldn’t seem to experience any positive feeling at all”, anxiety subscale: “I felt scared without any good reason”, stress subscale: “I found it hard to wind down”) that are rated on a 4-point Likert-type scale (0 = did not apply to me at all, 3 = applied to me very much or most of the time). The higher the sum score, the higher the level of the symptoms.

Table 2 shows the scale reliability of the used instruments in both countries.

**2.3. Statistical analyses**

In both samples, the same statistical analyses were conducted using SPSS 26. First, the relationship between the stay in domestic quarantine, on the one hand, and addictive SMU, symptoms of depression, anxiety and stress, on the other hand, was investigated by the calculation of five regression analyses. Each regression model consisted of two steps. In Step 1, we included the demographic variables (i.e., age, gender) as covariates to control for them. Furthermore, we included occupation as a further covariate in the German sample. In the Lithuanian sample, occupation was not included as a covariate because all participants were students. In Step 2, we included the variable quarantine that revealed whether participants were currently in domestic quarantine or not. Addictive SMU, depression, anxiety and stress symptoms as well as an overall sum score of the negative symptoms (depression, anxiety, stress), respectively, served as the dependent variable in the regression model. Next, the association of addictive SMU with symptoms of depression,

**Table 4**  
Hierarchical regression analyses (outcomes: addictive social media use, symptoms of depression, anxiety, and stress; Lithuanian sample).

	$\beta$	95% CI	T	Adjusted R <sup>2</sup>	Changes in R <sup>2</sup>
<b>Addictive Social Media Use</b>					
Step 1, F(2,322) = 6.130, p = 0.002				0.031	0.037
Age	-0.055	[-0.612, 0.200]	-0.999		
Gender	-0.185**	[-3.653, -0.965]	-3.380		
Step 2, F(3,321) = 4.201, p = 0.006				0.029	0.001
COVID-19 Quarantine	0.033	[-0.991, 1.873]	0.606		
<b>Depression Symptoms</b>					
Step 1, F(2,322) = 0.437, p = 0.646				-0.003	0.003
Age	-0.045	[-0.615, 0.259]	-0.801		
Gender	-0.028	[-1.818, 1.079]	-0.502		
Step 2, F(3,321) = 2.070, p = 0.104				0.010	0.016
COVID-19 Quarantine	0.128*	[0.265, 3.328]	2.308		
<b>Anxiety Symptoms</b>					
Step 1, F(2,322) = 4.047, p = 0.018				0.018	0.025
Age	-0.045	[-0.483, 0.199]	-0.821		
Gender	-0.151**	[-2.705, -0.446]	-2.744		
Step 2, F(3,321) = 3.309, p = 0.020				0.021	0.005
COVID-19 Quarantine	0.074	[-0.379, 2.023]	1.346		
<b>Stress Symptoms</b>					
Step 1, F(2,322) = 1.911, p = 0.150				0.006	0.012
Age	-0.017	[-0.496, 0.365]	-0.298		
Gender	-0.107	[-2.830, 0.021]	-1.939		
Step 2, F(3,321) = 1.657, p = 0.176				0.006	0.004
COVID-19 Quarantine	0.059	[-0.691, 2.343]	1.071		
<b>DAS Symptoms</b>					
Step 1, F(2,322) = 1.892, p = 0.152				0.005	0.012
Age	-0.039	[-1.471, 0.700]	-0.699		
Gender	-0.102	[-6.946, 0.247]	-1.832		
Step 2, F(3,321) = 2.321, p = 0.075				0.012	0.010
COVID-19 Quarantine	0.098	[-0.372, 7.259]	1.776		

Notes. N = 325; COVID-19 = coronavirus disease 2019; DAS = depression, anxiety, stress;  $\beta$  = standardized coefficient beta; CI = Confidence Interval; in each step of the regression analyses, only new included variables are presented.

All participants were students; therefore, occupation was not included in the calculations.

\*\* p < .01.

\* p < .05.

anxiety and stress and the overall negative symptoms score was assessed by zero-order bivariate Pearson correlations. Cohen's q (Cohen, 1988) served as effect size measure of the differences between the correlations (quarantine vs. non-quarantine).

### 3. Results

Table 2 presents the descriptive statistics of the investigated variables for individuals in quarantine and individuals not in quarantine, respectively, for the German and the Lithuanian sample. It is remarkable that addictive SMU, depression, anxiety and stress were slightly higher in the quarantine group than in the non-quarantine group in both countries.

Table 3 shows the results of the regression analyses in the German sample. Only the model that included addictive SMU as dependent variable was significant. Younger age and staying in domestic quarantine were significant predictors in this model (both: p < .01). In the Lithuanian sample, the regression models were not significant indicating no significant group differences (see Table 4).

Table 5 shows similar correlation pattern in both samples: The significant positive correlations between addictive SMU and symptoms of depression, anxiety and stress as well as the overall score of the negative symptoms were higher in the quarantine group than in the non-quarantine group (effect sizes of group differences were small: q = 0.04 to 0.21, see Table 3).

### 4. Discussion

The outbreak of COVID-19 caused extraordinary changes of everyday life (Garfin et al., 2020). Due to physical distancing and quarantine, a lot of social interaction was transferred to social media (Gao et al., 2020). The present study provides evidence that the enhanced use of social media might contribute to tendencies of addictive SMU and negatively impact well-being.

In the sample from both Germany and Lithuania, individuals in quarantine had higher levels of addictive SMU than participants who were not in quarantine. The difference was significant only in the German sample (see Research Question 1). Following considerations may at least partly explain this finding. Humans are social beings who have a strong need for belonging to a social group that provides positive feedback (Wills, 1991). The quarantine restricted the possibilities to satisfy this need in the offline world. The significance of SMU increases as it became the main way to interact with the world outside the own home and to escape domestic conflicts. As a consequence, the intensity of online activity could enhance (Cellini et al., 2020). This, however, could foster addictive tendencies (Brailovskaia and Margraf, 2017; Marino et al., 2018). Notably, the extent of addictive SMU might depend on further factors such as the individual evaluation of the burden caused by the COVID-19 situation: the higher the perceived burden, the more often the individual escapes into the online world (Ni et al., 2020). The immersion into the multifaceted world of SM such as Facebook and Instagram allows to at least temporarily forget the negative emotions and to experience positive ones (Kaye, 2019). Due to the remarkable higher COVID-19 case numbers in Germany, the perception of burden specifically by people who have to stay in quarantine might be higher in Germany than in Lithuania. This might at least partly explain why the difference of addictive SMU was significant in the German sample only. Moreover, the comparatively small size of the Lithuanian quarantine group might contribute to the not significant findings.

In both samples, participants in quarantine had slightly – but not significantly – higher symptoms of depression, anxiety and stress than

**Table 5**

Correlations of investigated variables in the German sample and in the Lithuanian sample (quarantine vs. non-quarantine).

	German sample, N = 529		q	Lithuanian sample, N = 325		q
	Quarantine, n = 157 Addictive SMU	Non-Quarantine, n = 372 Addictive SMU		Quarantine, n = 54 Addictive SMU	Non-Quarantine, n = 271 Addictive SMU	
Depression	.266**	.231**	.04	.352**	.295**	.06
Anxiety	.328**	.221**	.12	.446**	.263**	.21
Stress	.316**	.224**	.10	.431**	.288**	.17
DAS	.345**	.263**	.09	.469**	.313**	.19

Notes. SMU = social media use; DAS = depression, anxiety, stress; q = Cohen's q, effect size.

\*\*  $p < .01$ .

individuals who were not in quarantine (see Research Question 2). This finding corresponds to recent research from China that described individuals who stay in quarantine due to COVID-19 to have higher levels of anxiety symptoms than people who are not in quarantine (Zhao et al., 2020). Thus, it seems that the extraordinary changes of daily life caused by the COVID-19 situation could slightly stronger impact the well-being of individuals who stay in quarantine than of people who are not in quarantine. This finding might be at least partly explained as following. Sense of freedom and of control of own mobility and activity is an important predictor of subjective well-being (Liu et al., 2018). Individuals who experience different areas of life as uncontrollable often have enhanced levels of depression, anxiety and stress symptoms (Gorday et al., 2018; Manz et al., 2001). This seems to be particularly true for the COVID-19 situation (Bueno-Notivol et al., 2020). In spring 2020, despite the general need for self-isolation, people who did not have to stay in domestic quarantine could experience a higher level of both freedom and control than individuals in quarantine. This might contribute to their lower level of the negative symptoms.

Correspondingly to previous findings (Marino et al., 2018), in all investigated groups, addictive SMU was positively associated with symptoms of depression, anxiety and stress as well as the overall score of the negative symptoms. The associations were stronger in the quarantine groups. Considering the cross-sectional design of the current study, it remains unclear whether the negative symptoms could contribute to the enhancement of the addictive tendencies or vice versa. Both directions were described by earlier studies. On the one hand, symptoms of depression and anxiety positively predicted the level of addictive SMU (e.g., Atroszko et al., 2018; Koc and Gulyagci, 2013; Ryan et al., 2014). Depression symptoms significantly mediated the positive association between the experience of daily stress and the level of addictive SMU (Brailovskaia et al., 2019b). On the other hand, addictive SMU positively predicted symptoms of depression (Brailovskaia et al., 2019a) and stress (Brailovskaia and Margraf, 2017). Thus, there seems to be a close interaction between addictive SMU and the negative symptoms that could become stronger for individuals who stay in quarantine.

In spring 2020, the self-isolation and quarantine were the most effective steps to reduce the pandemic spread (Gandhi and Rutherford, 2020). However, the present findings reveal that how the time in quarantine is used could significantly influence individual's well-being. Specifically, the enhanced use of SM could contribute to negative consequences. It could foster addictive tendencies and the increase of depression, anxiety and stress symptoms. Experimental research that was conducted previously to the COVID-19 outbreak described a longitudinal significant increase of well-being in individuals who were advised to reduce their daily SMU for the duration of two weeks (Brailovskaia et al., 2020a). Therefore, particularly for people who stay in quarantine, it is recommended to maintain the daily routine as far as possible, to consciously reduce the online activity, and to stay in contact with family and friends via telephone. To prevent cognitive and emotional overload by the unfiltered information provided on SM, other sources such as newspaper articles and official governmental sites should be used to stay up to date about the COVID-19 situation (Zhong et al., 2021). Moreover, individuals in quarantine should engage in physical activity (e.g., gymnastics, or if available the use of sportive

home equipment). Physical activity is an important protective factor that can reduce the negative impact of daily stress and that can improve well-being (Brailovskaia et al., 2018; Wunsch et al., 2017). Individuals who regularly engage in physical activity experience more positive emotions and are at less risk for the development of symptoms of depression and addictive SMU (Brailovskaia and Margraf, 2020; Richards et al., 2015). A moderate daily physical activity for at least 30 min is recommended by the World Health Organization to protect mental and physical health (World Health Organization, 2003).

Despite the currency of the present investigation, its limitations are important to mention. First, the mostly female, young and well-educated composition of both investigated samples limits generalizability of current findings. Future studies are suggested to replicate the present findings in more population-representative samples considering the demographic variables. Notably, in a recent study, people who were older than 50 years had lower levels of anxiety due to COVID-19 than younger individuals (i.e., age: 13 to 30 years, and 31 to 50 years). In addition, higher education predicted less anxiety symptoms (Zhao et al., 2020). Furthermore, the German and the Lithuanian sample differed considering age and occupation (see Table 1). The Lithuanian sample was younger than the German sample and included only students, while one-third of the German participants were employees (see Table 1). These differences limit the comparability of the result pattern of both samples. Second, as the COVID-19 situation changes daily, the current findings are a snapshot of the COVID-19 situation in Germany and Lithuania in April 2020. Nevertheless, they do not lose importance because they contribute to the prediction of potential long-term consequences of the pandemic for mental health. Third, in the present study, the habits of SMU such as the frequency of daily visits, their duration and the type of online activities (i.e., active, passive) were not assessed. These variables can influence the development of addictive tendencies (Marino et al., 2018). Therefore, they should be focused in future studies that investigate addictive SMU in the context of COVID-19. Fourth, the cross-sectional nature of the current study does not allow conclusions on the direction of the relationships between addictive SMU and the negative symptoms.

Despite the described limitations, the present cross-national study provides evidence for potential negative consequences of intensive SMU for psychological well-being during the COVID-19 quarantine. The present findings could be made a topic of discussion for the preparation of programs that are designed to protect mental health during the pandemic.

#### Declaration of Competing Interest

None.

#### Contributors

Julia Brailovskaia, Inga Truskauskaitė-Kuneviciene, Jürgen Margraf and Evaldas Kazlauskas conducted the study design. Julia Brailovskaia wrote the first draft of the manuscript and conducted statistical analysis. Julia Brailovskaia conducted literature searches. Julia Brailovskaia and Inga Truskauskaitė-Kuneviciene conducted data collection. Julia

Brailovskaia and Inga Truskauskaitė-Kunevičienė conducted data preparation. Inga Truskauskaitė-Kunevičienė, Jürgen Margraf and Evaldas Kazlauskas reviewed and edited the first draft. All authors contributed to and have approved the final manuscript. All authors state their compliance with the Code of Ethics of the World Medical Association (Declaration of Helsinki).

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