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THE RELATIONSHIP BETWEEN SOCIAL NETWORK SITES USE, STRESS, ANXIETY AND DEPRESSION SYMPTOMS AMONG UNIVERSITI SAINS MALAYSIA (USM) STUDENTS DURING THE COVID-19 PANDEMIC

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ABSTRACT

Social media has become a tool that facilitates almost all areas of our lives be it shopping, work, entertainment. However, the rate of consumption of social network sites (SNS) increases during natural disasters, military conflicts and states of emergencies such as the recent Covid-19 pandemic. This occurs due to various factors ranging from the necessity to stay updated about recent news and measures to the need for escaping from negative affect such as stress, anxiety and depressive symptoms. However, SNS can become a source of heightened stress, anxiety and depression symptoms if not well managed or used excessively. The aim of the current study is to investigate the relationship between SNS use, stress, anxiety and symptoms of depression in the context of Covid-19 pandemic. Additionally, the study attempted to establish the criteria to measure excessive SNS use. A total of 266 participants aged 18-26 years old students of a public university in Penang, Malaysia completed an online survey containing SNS use self-report, Bergen's Social Media Addiction Scale (BSMAS) and Depression, Anxiety, Stress scale (DASS-21). Findings suggested a significant relationship between SNS use and stress, and SNS use was not a significant predictor for anxiety and depression levels. Additionally, the findings showed that in accordance with BSMAS mean scores and SNS daily use of the current sample, more than 4 hours of SNS use could be considered as excessive. If excessive use was defined as a discrepancy between current and ideal SNS use and BSMAS scale, an interval of more than 1 hour between actual and ideal SNS use is to be considered as excessive.

INTRODUCTION

Social Network Sites (SNS) have long become an inseparable part of our life during the past two decades (Anderson & Jiang, 2018). However, as they grow to offer more opportunities and tools in different spheres of life, individuals spend more time on them and it becomes harder to objectively evaluate personal SNS consumption and manage efficiently.

SNS use often increases during states of emergency and disasters as people strive to stay updated about the latest news (Bowden-Green et al., 2021). The Covid-19 pandemic was one such events that had a drastic social, political, and economical impact on people and their well-being across the globe. Restrictive measures, movement control and isolation resulted in the increased number of SNS users among the population (Nabity-Grover et al., 2020). SNS was a preferred way to get instant news related to pandemic and it played an important role in disseminating important information. SNSs became a useful channel for health advice,

information exchange and receiving the latest standard operating procedures (Merchant & Lurie, 2020). Faruk et al., (2022) suggested that 90% of their survey participants reported SNS as their preferred source for recent updates and news as compared to 28% choosing newspaper and 43% opting for television. Bowden-Green et al., (2021) found that during the lockdown, individuals used SNS more than usual in order to maintain personal relationships and pass time. Islam et al., (2022) suggested that individuals also use SNS to seek emotional support and exchange and produce social information during pandemic. Another study by Islam et al., (2020) suggested that individuals may use SNS more than usual as an adverse reaction and a coping mechanism in response to stress that could be induced by the pandemic, which may further lead to "SNS exhaustion" and information overload (Islam et al., 2020; Laato et al., 2020). A vast body of research suggested that excessive SNS use may lead to various negative effects such as decreased well-being (Satici & Uysal, 2015), loneliness (Ryan & Xenos, 2011), eating disorders (Mabe et al., 2014), problems with sleep (Koc & Gulyagci, 2013), and self-esteem (Saiphoo et al., 2019). More and more research findings are reporting significant associations between SNS use anxiety (Barman et al., 2018; Docu, 2018; Farahani et al., 2011; Hussain & Griffith, 2018; Hussain et al., 2020; Labrague, 2014; Primack et al., 2017), depression (Best et al., 2014; Hoare et al., 2016) and stress (Gao et al., 2020).

The directionality of the link between stress, anxiety and depression symptoms and SNS use is not clear, and some scholars argue that negative conditions such as stress, anxiety and depression symptoms may also fuel excessive SNS use as users try to find solace in online interactions (Carbonell & Panova, 2016; Marino et. al, 2016).

LITERATURE REVIEW

More and more research has documented how the Covid-19 pandemic was considered a period of high psychological distress that included sharp increases in stress levels, mental health breakdowns and suicide rates. Similar to other emergency states and outbreaks, pandemics often undermine one's mental health and well-being due to prolonged periods of increased fear and uncertainty (Fung et al., 2014; Mihashi et al., 2009). Fear of death, illness and feeling of hopelessness were associated with increased anxiety among individuals in the pandemic context (Shigemura et al., 2020; Bakioglu et al., 2021). Along with the risks to physical health such as Covid-19 and associated health complications, individuals also experience constant worrying, panic attacks, stress and depression that can later become precursors to development of mental disorders (Ahorsu et al., 2020).

Research has suggested that users who are vulnerable to negative conditions such as stress, anxiety and depression may be prone to use social media more than others in order to alleviate their mental state. For example, Kircaburun and Griffith (2019) suggested that escapism motives may influence more frequent use of SNS among individuals with lower self-esteem and higher levels of loneliness (Kırcaburun & Griffiths, 2019). Moreover, individuals suffering from over- or under- stimulation may use the internet as a relief mechanism (Mastro et al., 2002). Similarly, Caplan (2010) suggested that users with low life satisfaction may be more prone to excessively using social networks to alleviate bad moods. Jeong et al., (2016) observed that stress may lead to excessive smartphone use as social media may be a way of stress relief. Tarsha (2016) also claimed that adolescents felt the urge to compulsively check social media to satisfy feelings of emptiness, longing, and fear of isolation. LaRose et al., (2003) proposed that the transition towards problematic SNS usage may begin once SNS related activities become a mechanism to relieve stress, loneliness, depression, and anxiety. In such circumstances, users with anxiety and depression may find themselves trapped in a vicious

cycle of SNS use, trying to escape negative states, while at the same time, limiting interaction with real friends and family or processing their emotions in healthy ways.

More research is needed to investigate how excessive SNS use affects individuals' mental well-being during a crisis to prevent individuals from adopting it as a coping mechanism when uncontrolled. However, what is considered as "excessive" SNS use? Researchers argue that since extensive use of social media is becoming a norm, problematic or excessive use should be measured against the individual's own consumption patterns (LaRose et al., 2003). For instance, Cao et al., (2018) claimed that excessive SNS use is determined by the degree to which the actual SNS use exceeds the amount of initially intended use.

There is also accumulating research suggesting that adolescents and emerging adults may be most at-risk of using SNS excessively. For example, Turel and Qahri-Saremi (2016) suggested that university students may use SNS more due to more flexible time schedules and lack of parental or organizational control over their SNS use. Also, this age group often uses a variety of platforms (Smith & Anderson, 2018). Findings of meta-analysis suggest that college students are more prone to use SNS excessively as compared to middle and high school students as they study in a less structured environment with relatively more freedom over managing their time and attendance (Liu et al., 2017). Dhir and Tsai (2017) argued that SNS studies of older adults are currently more prevalent in literature than adolescents and young adults. However, these age groups differ in the sought gratifications, thus the patterns of SNS use may differ between these age groups. Adolescents appeared to seek higher exposure through SNS use as compared to young adults as they are still in the life stage of shaping their identity.

The current study seeks to test whether an individual mismatch between desired and actual SNS consumption could act as an attribute of excessive SNS use. Additionally, this study seeks to identify the relationships between SNS use and stress, anxiety and depression symptoms among emerging adults (age 18 to 25 years) during the recent COVID-19 pandemic. Specifically, we predict that SNS use will predict higher levels of stress, anxiety and depression.

METHODOLOGY

Study Procedure

This study was conducted in accordance with research ethics guidelines and approved by the Human Research Ethics Committee USM (HREC) [protocol code USM/JEPeM/21030255]. Participants (N=266) were recruited by means of announcements and posters among students of Universiti Sains Malaysia and among participants of various social media groups (Facebook, Whatsapp, Instagram, Telegram) between July - November 2021. The sample was taken from a single population of university students to ensure homogeneity of the participants, namely more control over demographic variables, as well as control over external and environmental influences. Additionally, the study was conducted during Covid-19 pandemic Movement Control Order (MCO), which presented a difficulty in expanding the reach of the study. The inclusion criteria were: Age between 18-26 years old, intermediate level of English, not being diagnosed or currently undergoing treatment for a mental disorder, use SNSs daily. In the final analysis, 66 participants were excluded as they did not meet inclusion criteria. The remaining participants (N=200) aged between 18-26 years old were given a QR code or a link to Google Forms in which participants gave consent and completed the research materials. The research materials included a demographics section followed by three SNS use self-report items, the Bergen's Social Media Addiction Scale and the Depression Anxiety Stress Scale (DASS)-21.

Materials

SNS use

Participants were asked to complete three self-report items about their SNS use patterns as well as Bergen's Social Media Addiction Scale (BSMAS). The first item of the self-report was "*How much time do you use SNS daily?*" and participants selected one of seven options consisting of intervals of SNS use: *"up to 1 hour"; "30min - 60min"; "1h - 1h30min"; "1h30min - 2h"; "2h - 2h30min"; "2h30min - 4h"*; and *"more than 4h"*. The second item was "*How much time would you like to use SNS daily?*" and participants could choose from 7 intervals of ideal SNS use starting from "*less than 30 minutes"* until *"more than 4 hours"*. The third question was *"Are you satisfied with your current SNS use?"* and participants could choose "*Satisfied*"; "*Would like to use slightly less*"; "*Would like to use significantly less*"; or "*Would like to use more*".

The BSMAS scale consisted of six items on a five-point Likert scale such as "I spend a lot of time thinking about social media" or "I feel an urge to use social media more and more". Participants were expected to evaluate each item on a scale from 0 "*very rarely*" to 5 "*very often*". The cut off criteria indicating excessive SNS use using the BSMAS as a measure was a score of 19 and above (Bányai et al., 2017).

Stress, Anxiety and Depression

Anxiety and depressive symptoms were measured by Depression, Anxiety and Stress Scale 21 (DASS-21) (Lovibond & Lovibond, 1995). There were 21 items on a 5-point Likert scale and participants rated each statement by how it applied to them over the past week from 0 being "*Did not apply to me at all*" to 4 being "*Applied to me very much or most of the time*" (Lovibond & Lovibond, 1995).

RESEARCH RESULTS

SNS use

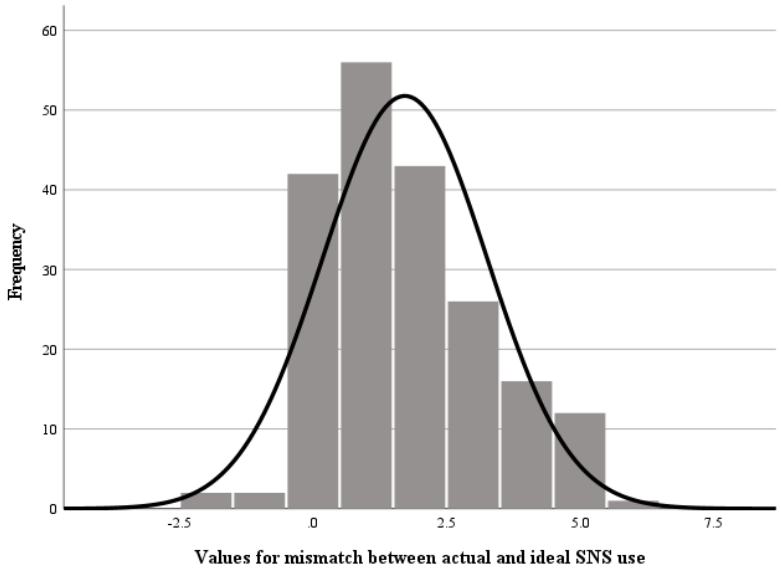
Participants were categorized into four groups based on their self-report daily SNS use: "up to 1 hour"- 7.5% (15/200); "1 hour - 2 hours 30 minutes"- 24% (48/200); "2 hours 30 minutes - 4 hours" - 27% (54/200); and "more than 4 hours" - 41.5% (83/200). Close to 70.0% (137/200) of the sample reported using social media longer than the global average of 2 hours 30 minutes (Clement, 2019).

Participants reported their level of satisfaction with their current SNS use by choosing one of the following four options: "*would like to use more*"; "*would like to use significantly less*"; "*would like to use slightly less*"; and "*satisfied*". Approximately one-fifth (42/200) of the sample reported that they would like to use SNS significantly less while 41.5% (83/200) reported that they would like to use SNS slightly less. About 67% (56/83) of participants who reported "more than 4 hours" of SNS use expressed willingness to reduce their SNS use.

Participants' current SNS use and their ideal SNS use were compared by subtracting their ideal SNS use from current SNS use intervals as a way to determine any mismatch or excess use. A mismatch occurred when participants reported different values for current SNS use and ideal SNS intervals. A positive value of SNS use mismatch (e.g. 1, 2, 3, etc.) indicated ideal SNS use time interval was less than current reported SNS use interval (see Figure 1).

Similarly, a negative value indicated ideal SNS use interval exceeded current SNS use interval. One interval of SNS use mismatch is equal to 30 minutes. For example, if a participant reported an ideal SNS use of 2h - 2h30min and their current SNS use as 2h30min - 3h, their mismatch value is 1 interval of 30 minutes. Close to 80.0% (154/200) of the sample reported that their ideal use should be less than their current use of SNS. The difference between current and ideal use will be referred to as a "mismatch of ideal and actual SNS use" in the following sections.

$$Mismatch = Current\ use - Ideal\ use$$



Note. N=200

Figure 1: Mismatch between actual and ideal SNS use

BSMAS

The mean score of Bergen's Social Media Addiction Scale (BSMAS) in the current sample was M = 18.41 (SD = 5.2). Descriptive statistics of depression, anxiety and stress scores measured by DASS-21 and BSMAS scores of participants in the four categories of current SNS use are presented in Table 1. Mean BSMAS scores were significantly different across categories of SNS use [$F(3,196) = 14.49$, $p < .01$]. Tukey's post-hoc analyses revealed that the mean value of the BSMAS scores were significantly different between participants who reported "up to 1h" and "1h – 2h30min" of SNS use ($p < .001$, 95% CI [-9.39, -2.13]), "up to 1h" and "2h30min – 4h" groups ($p = .001$, 95% CI [-8.81, -1.64]) and "up to 1h" and "more than 4h" of SNS use ($p < .001$, 95% CI [-11.67, -4.78]). The scores were also significantly different between "1h – 2h30min" and "more than 4h" groups ($p = .024$, 95% CI [-4.69, -0.24]) and "2h30min – 4h" and "more than 4h" groups ($p = .002$, 95% CI [-5.14, -0.85]). Considering a mean score of M = 19 and above as a threshold for excessive SNS use, 41.5% (n = 83/200) of study participants reported "more than 4h" of SNS use and could be considered as excessive users (Bányai et al., 2017).

Table 1: Descriptive Statistics of BSMAS and Stress, Anxiety and Depression Scores Across Four Categories of SNS use (N=200)

	Less than 1h M (SD)	1h – 2h30min M (SD)	2h30min – 4h M (SD)	More than 4h M (SD)
BSMAS	12.2 (5.37)	17.9 (4.27)	17.4 (4.44)	20.4 (5.05)
Depressive symptoms	13.6 (11.64)	13.7 (9.2)	15.3 (10.18)	18.6 (11.15)
Anxiety symptoms	8.1 (6.69)	14.2 (9.62)	14.37 (9.52)	16.8 (9.62)
Stress symptoms	13.3 (10.02)	16.8 (9.83)	15.3 (9.08)	19.4 (10.03)

Note. BSMAS = Bergen Social Media Addiction Scale.

Mismatch between current and ideal SNS use and BSMAS

Scores from the Bergen's Social Media Addiction Scale and mismatch between current and ideal SNS use were compared. Referring to the mismatch between current and ideal SNS use, participants who reported a mismatch of 2 intervals (1 hour) also reported the highest mean BSMAS scores (M=20.12) compared to the other participants. Participants with mismatch intervals of 2, 4 and 5 reported scores higher than BSMAS cut off criteria (M=19) for excessive SNS use.

SNS use was compared by means of current SNS use and BSMAS scores, and there was a significant correlation between the two measures ($r = 0.37$, $p < 0.001$). The distribution of BSMAS mean scores and SNS daily use (see Table 1) of the current sample suggested that more than 4 hours of SNS use could be considered as excessive. If excessive use was defined as a discrepancy or mismatch between current and ideal SNS use and BSMAS scale, an interval of >1 hour between actual and ideal SNS use is excessive.

Stress and SNS use

Mean stress scores of participants from each of the four categories of SNS use were compared (see Table 1), and one-way ANOVA revealed significant differences in stress scores between categories of SNS use [$F(3,196)=2.85$, $p=0.04$].

A linear regression was conducted to test whether SNS use predicted stress levels. Findings suggested that SNS significantly predicted stress levels [$F(1, 198) = 5.355$, $p = .022$], with $R^2 = 0.026$. Each extra stress level score was associated with 0.16 points on SNS use scale ($B = 0.162$).

Anxiety and SNS use

Mean anxiety scores of participants from each of the four categories of current SNS use were compared (see Table 1), and one-way ANOVA revealed significant differences in anxiety scores between categories of current SNS use [$F(3,196)=3.86$, $p=.01$]. A linear regression was conducted to test whether SNS use predicted levels of anxiety. Findings suggested that SNS

significantly predicted anxiety levels [F(1, 198) = 9.237, p = .023], with R^2 = 0.045. Each extra anxiety level score was associated with 0.21 points on SNS use scale (B = 0.211).

Depression symptoms and SNS use

Mean depression scores of participants from each of the four categories of SNS use were compared (see Table 1), and one-way ANOVA revealed significant differences in depressive scores between categories of SNS use [F(3,196)=2.83, p=0.04]. A linear regression was conducted to test whether SNS use predicted levels of depression. Findings suggested that SNS significantly predicted depression levels [F(1, 198) = 7.622, p = .006], with R^2 = 0.037. Each extra depression level score was associated with 0.19 points on SNS use scale (B = 0.193).

DISCUSSION

Criteria of "excessive" SNS use

Despite a rich body of research regarding excessive use is present, there is no consensus as to what is considered 'excessive use'. Scholars suggest that since extensive use of social media is becoming a norm, excessive SNS use should be measured considering the user's own consumption patterns (LaRose Lin & Eastin, 2003; Cao et al., 2018). Due to differences in lifestyles of individuals and personal abilities to manage SNS use, it is important to consider the degree to which individuals could control one's own SNS consumption along with disparity between expected use and actual use. Excessive SNS use in the current study was measured by comparing BSMAS scores and self-reported SNS use time. Additionally, intervals of mismatch between actual and ideal SNS use were used to determine a user's ability to manage one's own SNS use consumption against BSMAS mean scores. In the current study, SNS use in the "more than 4 hours" category was considered excessive as participants in this category had a mean BSMAS score higher than 19 points (Bányai, et al., 2017). Findings from the current study were significantly different from findings by Luo et al., (2021) who attempted to establish a cut-off criteria for BSMAS scale. They reported an average of 13.6 hours weekly SNS use, or 1.94 hours per day, in the general population (n = 20,977) with a cut-off score of 24 on BSMAS scale.

After comparison against cut off score of BSMAS scale (M >=19), an interval of one hour or more of the mismatch between actual and ideal SNS use was considered excessive. There were 4 participants who had a negative mismatch intervals of -1(=30 minutes) and -2 (=1 hour), indicating that their ideal SNS use exceeds current SNS use. However, their BSMAS scores indicated excessive or problematic SNS use despite their desire to use SNS more. Since the interval of mismatch is in the opposite direction of prediction, it is possible that these participants misjudged their actual or ideal SNS use. Lee et al., (2017) suggested that individuals are often unable to evaluate their SNS use with precision and tend to over- or under report it. Further research with a larger sample may help to identify whether a negative mismatch of ideal and actual use could be potentially informative indicator of problematic SNS use.

Stress, anxiety and depression symptoms and SNS Use

As predicted, all three variables namely stress, anxiety and depression symptoms had a significant positive relationship with SNS use among the participants in our sample. This is consistent with the findings of previous studies on emerging adults (Al-Dwaikat et al., 2020; Islam et al., 2020; Shannon et al., 2022). This group must contend with obstacles unique to this stage of life, including the pressure to adjust to changes in social, academic, and professional standing as well as a potential relocation. By spending time on SNS, users can "escape" the stress and adverse effects that the pandemic brought on them in real life. These individuals may now use social media and the online world as a tool to escape from actual issues as well as to relieve tension and unpleasant feelings (Marino et al., 2016). Low self-control, inadequate guidance, and lack of prompt intervention could contribute to the development of a damaging cycle of behaviour. Moreover, people who are prone to stress, anxiety, and depressive symptoms are more vulnerable to the negative impacts of SNS use, including negative thoughts and skewed self-perception promoted by online content (Lup et al., 2015).

LIMITATIONS AND FUTURE DIRECTIONS

Several limitations of the current study may prevent the results from being generalised. First, participants' gender was not controlled for in our analyses. A meta-analysis suggested that males of various age groups used SNS more frequently than females in many studies (Baloglu et al., 2020). Future studies should examine variables that may contribute to gender differences in SNS use, such as differences in content consumption, self-regulation, and vulnerability to mental health issues should be considered in SNS use research.

Second, several studies have implied that self-report measures of SNS use are inadequate and unreliable (Junco, 2013; Lee et al., 2017; Scharkow, 2016). The reporting of current and ideal SNS use of our participants were probably biased, as it is difficult to accurately estimate how much time is spent on an activity that is engrossing and thus, participants often underestimate or even overestimate their use of SNS (Junco, 2013). The current study aimed to limit the margin of error and overcome this limitation by asking participants to provide estimations of their SNS use with time intervals rather than reporting the number of minutes. Future research should make use of objective metrics, such as smartphone applications that record actual user's screen time.

Future research could further explore the directionality between SNS excessive use and stress, anxiety and depressive symptoms. It is still inconclusive to determine whether SNS use has direct causal relationship with stress, anxiety and depression as longitudinal studies of the topic are scarce due to the complexity, cost factor and long duration of such studies.

CONCLUSION

Findings from the current study suggested that four hours of daily SNS use could be considered as excessive. Alternatively, a discrepancy of one hour or more between actual and ideal, or desired SNS use could also signify excessive use. Additionally, our findings suggested that SNS use was significantly associated with stress, anxiety and depressive symptoms among emerging adults during the COVID-19 pandemic. The mismatch between current and ideal SNS use might be an alternative method of assessment which may potentially identify problems with self-regulation of SNS consumption and inform early interventions. Current study findings suggested that the discrepancy between current and ideal SNS use might be more

informative than comparing the individual consumption against the global SNS use average, as the consumption patterns and nature of SNS use vary among individuals. SNS use should be studied more extensively in the field of cyber and media research to understand its role in the new era of information overload and its easy access in addition to providing practical recommendations for the general public who may be prone to use it as a coping mechanism, knowingly or unknowingly.

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