

Upward Social Comparison As Mediating Role In The Relationship Between Social Networking Sites Use And Depression: A Study Among Local University Students In Cyberjaya

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Abstract

Social networking sites (SNS) had become integral into our daily living. Generally, college students used SNS mainly to fulfill social needs, but SNS also became a platform for them to perform impression management, by idealizing their status on SNS. This appeared to be beneficial where users can decide how to present their selves on SNS, but on the other hand, it also exposed users to be more likely to engage in upward social comparison, which could potentially result in depression. The aim of present study was to investigate whether upward social comparison mediates the relationship between SNS use and depression among local university students in Cyberjaya. Participants were recruited in pilot (N=30) and actual study (N=149) by adopting purposive sampling method. Participants were required to fill up a questionnaire which was comprised of demographic section, Social Comparison Rating Scale (SCRS), and Center for Epidemiological Studies Depression Scale (CES-D). Results findings indicated that only upward social comparison was significantly positively correlated with depression. Limitations and recommendations were discussed in respect of current results findings. Nevertheless, current result findings implied that the experience that people underwent when using SNS may be a more crucial factor to be considered in understanding how SNS was related to depression.

Keywords: social networking sites use, depression, upward social comparison

Introduction

Social networking sites (SNS) undeniably is becoming a lifestyle nowadays. It has become integral part of our lives. Due to this change, studies relating to SNS are also emerging in order to understand what motivates people to engage in SNS (Brandtzæg & Heim, 2009; Cheung, Chiu, & Lee, 2011; Raacke & Bonds-Raacke, 2008), and what potential effects it could bring to mental health status among SNS users (Labrague, 2014; Sampasa-Kanyinga & Lewis, 2015; Steers, Wickham, & Acitelli, 2014; Woods & Scott, 2016). Some studies focused on the problematic use of SNS or SNS

addiction, suggesting that people could potentially be addicted to SNS (Andreassen, 2015; Kuss & Griffiths, 2011). This could be the reason why attention has been drawn into researching the field relating to SNS.

There are several types of SNS; however, the ones which are more commonly used are examples like Facebook, Twitter, Instagram, to name a few. Most studies focused specifically on one particular type of SNS, with more studies examined particularly on Facebook use, such as its relationship with relatedness-need (Sheldon, Abad, & Hinsch, 2011), perceived social support (Frison & Eggermont, 2016), social comparison (Lee,

2014), well-being (Burke & Kraut, 2016; Satici & Uysal, 2015; Shakyia & Christakis, 2017), self-esteem (Bergagna & Tartaglia, 2018; Gallinari, 2018; Vogel, Rose, Roberts, & Eckles, 2014), and depression (Feinstein et al., 2013; Frison & Eggermont, 2016; Steers et al., 2014; Tandoc Jr, Ferrucci, & Duffy, 2015). There were several studies which focused on Instagram by examining its association with orthorexia nervosa (Turner & Lefevre, 2017), body image (Fardouly, Willburger, & Vartanian, 2017), loneliness (Yang, 2016), and depression (Frison & Eggermont, 2017; Lup, Trub, & Rosenthal, 2015). Moreover, there was one study on WhatsApp use that examine its association with communication quality and stress level (Blabst & Diefenbach, 2017). As for Twitter, studies had also been done in the past on investigating its relationship with social comparison (Panger, 2014), and psychological well-being (Doğan, 2016). However, instead of examining one particular SNS which most studies did, Kuss and Griffiths (2017) had suggested to study SNS in general as Facebook or Instagram is only one example of SNS. Hence, this current study aims to go along with that suggestion.

Generally, college students used SNS mainly to fulfill social needs, such as to maintain social relationship, making new friends, and locating old friends (Cheung et al., 2011; Raacke & Bonds-Raacke, 2008). Other than that, SNS had also become a platform for them to perform impression management, by presenting their idealized, rather than accurate, status on SNS (Nadkarni & Hofmann, 2012). This appeared to be beneficial where users can decide how to present their selves on SNS, but on the other hand, this platform also exposed users to be more likely to perform social comparison in an upward manner (Vogel et al., 2014). Subsequently, people would have lower self-esteem, and increase in depressive symptoms (Seabrook, Kern, & Rickard, 2016), as people would compare themselves to each other based on status posted. This in turn created a negative feeling in users when they viewed the posts (Lee, 2014).

Problem Statement

There are studies about the beneficial effects of SNS usage. For instance, results from study had shown that number of friends on Facebook was associated with reduction in stress and physical illness, as well as increased in perceived social support and well-being (Nabi, Prestin, & So, 2013); in addition, selective self-presentation in Facebook enhances self-esteem (Gonzales & Hancock, 2011). Anonymous chatting online was also found to be significantly reducing depression and loneliness as well as enhancing perceived social support and self-esteem (Shaw & Gant, 2002).

On the contrary, the usage of SNS could possibly create significant problems based on reports in other studies. Sampasa-Kanyinga and Lewis (2015) had found that more than two hours use of SNS per day was associated with increased psychological distress and suicidal ideation among the youngsters. Another study by Tandoc Jr et al. (2015) reported that the resulted feeling of envy from Facebook surveillance use increase depression among college students. Besides, when more time was spent on using Facebook, one will be more likely to experience depression and sense of inferior (Steers et al., 2014), higher anxiety level (Labrague, 2014; Woods & Scott, 2016), as well as poorer sleep quality, and lower self-esteem (Woods & Scott, 2016).

Despite of the controversy whether SNS use is more advantageous or otherwise, the prevalence of SNS addiction in society is undeniably expanding. In a paper by Bányai et al. (2017), 4.5% of adolescent was reported to be at-risk of developing SNS addiction in Hungary. In China, it is also reported that 12% of the sample was suggestive of SNS addiction (Wu, Cheung, Ku, & Hung, 2013); whereas in Singapore, results findings showed that 29.5% of college students were addicted to SNS (Tang & Koh, 2017). In term of Facebook addiction, the prevalence was estimated to be 4.5% to 8.4% in Germany among university students (Brailovskaia & Margraf, 2017); while 41.8%

among Thai adolescents (Khumsri, Yingyeun, Manwong, Hanprathet, & Phanasathit, 2015). Moreover, association of SNS addiction with different mental health problems was also documented, such as poorer sleep quality, as well as lower self-esteem, well-being and quality of life (Andreassen, 2015; Andreassen & Pallesen, 2014). Hence, it further emphasized that importance of studying how SNS use can affect mental health state among users.

As mentioned earlier, SNS became a platform for people to manage their self-presentation, yet also potentially became a platform for people to make comparison (Vogel et al., 2014). It had been long established that making upward social comparison increased the likelihood of developing depression (Ahrens & Alloy, 1997; Wetherall, Robb, & O'Connor, 2019). Furthermore, people tended to present the idealized self on SNS, by posting ideal photos, initiating information sharing and managing other-provided information (Dorethy, Fiebert, & Warren, 2014; Rui & Stefanone, 2013). When people spent more time on SNS, more upward social comparison would be made, and this in turn resulted in negative feelings in oneself (Seabrook et al., 2016; Steers et al., 2014). Therefore, it is important to examine the relationship between social comparison and depression in SNS context.

In Malaysia, the most frequent activity that people engaged in online was related to SNS, with estimation of 24.6 million users. Among those, 97.3% owned a Facebook account, followed by 57%, 48.3%, 23.8%, and 13.3% for Instagram, Youtube, Twitter and LinkedIn respectively (Malaysian Communications and Multimedia Commission, 2018). Not surprisingly, Facebook addiction was potentially prominent among students in Malaysia (Jafarkarimi, Tze, Saadatdoost, & Jee, 2016), while social interaction, passing time and entertainment were major contributors to Facebook addiction (Sofiah, Omar, Bolong, & Osman, 2011). In fact, local qualitative study revealed that students addicted to Facebook demonstrated themes of compulsion to check,

high frequency use, and to avoid offline responsibility (Zaremohzzabieh, Samah, Omar, Bolong, & Kamarudin, 2014). Besides, local news also conveyed that SNS addiction could lead to depression ("Addiction to social media", 2019; Cheng, 2016). In Malaysia context, people also tended to idealize their identity on SNS (Shafie, Nayan, & Osman, 2012), which created a platform for people to make upward social comparison, possibly explaining the relationship between SNS use and depression. By conducting study in Malaysia context, the aim of present study is to explore on whether upward social comparison mediates the relationship between SNS use and depression.

Significance of Study

By conducting present study, it can generate more understanding on how SNS use can result in depression. To further understand the mechanism between the relationship between SNS use and depression, social comparison will be examined to see whether it can explain such relationship. If significant positive result was found, it can suggest to people in being more mindful in their time spent on SNS so as to reduce the likelihood of making social comparison on SNS platform, and thus reducing the likelihood of developing depression. Although past studies had reported such relationship (Feinstein et al., 2013; Steers et al., 2014; Tandoc Jr et al., 2015), but such result had yet to be replicated in Malaysia. This is because Malaysia has collectivistic culture where people place more emphasis on maintaining social relationships, implying that they can spend more time on SNS and thus more likely in making social comparison. Therefore, from current study, it will help in understanding how SNS use and social comparison can contribute to depression by replicating past studies in Malaysia context.

Furthermore, by understanding the relationship between SNS use, social comparison and depression, it could guide intervention planning. Although SNS addiction was yet to be recognized as a mental disorder,

some individuals were at risk of developing such addiction and merit professional help (Chakraborty, 2017; Pies, 2009). If significant positive results were found in this study, intervention planning could target on gradually controlling SNS use as well as explaining the rationale behind such strategy based on social comparison theory. Despite the study reported that people with depression sought social support on SNS to help relieve depression (Shaw & Gant, 2002), it was also important to note that people with depression were more likely to make social comparison and leading to lower self-esteem, which maintained depression (Appel, Crusius, & Gerlach, 2015). In short, by gaining more understanding about how SNS use resulted in depression, present study could provide some ideas in intervention planning for individuals at risk of developing SNS addiction and depression.

Research Question and Research Objectives

In order to understand more about how SNS use could lead to depression, research question was formed as shown below.

RQ: How does SNS use, social comparison, and depression interact with each other?

To answer the research question above, four research objectives were established, as outlined below.

1. To examine whether SNS use correlates with depression
2. To examine whether SNS use correlates with upward social comparison,
3. To examine whether upward social comparison correlates with depression, and
4. To investigate whether the relationship between SNS use and depression is mediated by upward social comparison.

Conceptual and Operational Definitions

SNS use. In current study, SNS use was operationally defined as the self-report of duration of time spent in hours daily on SNS in general, such as Facebook, Instagram, Twitter, and other SNS.

Social comparison. According to Festinger (1954), social comparison means employing others as standards for comparison with the purposes of self-evaluation and self-enhancement.

The operational definition of social comparison was the total scores of Social Comparison Rating Scale (SCRS; Allan & Gilbert, 1995), whereby higher scores suggest more engagement in upward social comparison.

Depression. According to American Psychiatric Association (2020), depression is a common mental disorder, characterized by persistent sadness and a loss of interest in activities that you normally enjoy, accompanied by an inability to carry out daily activities, for at least two weeks.

Depression was operationally defined as the total scores of Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977) in current study. Higher scores mean higher depression level.

Literature Review

SNS Use and Depression

Spending more time on SNS was reported to be correlated with depression in past studies. There was study which investigated SNS use among young adults and reported a significant relationship between daily time spent on SNS and depression in USA (Lin et al., 2016). Similar result was also reported in another study conducted among adolescents in Norway (Brunborg & Andreas, 2019). However, whether depression resulted in more SNS use or vice versa remained a question. Some researchers had suggested that people who were more likely to spend more time on SNS, particularly on Facebook, could indicate a reference to depression (Moreno et al., 2011).

Besides, people experiencing depression tend to spend more time on online communication activities as a way to alleviate depression, yet became trapped in its problematic use (Kim, Seo, & David, 2015).

Another reason why people experiencing depression were more prone to spending time on SNS was because of their need to seek social support. In research by Shaw and Gant (2002), results showed that the scores for depression in participants decreased while perceived social support increased after chatting with others in an online chat room. This perceived social support also emerged from the online support network satisfaction, especially for those with interpersonal motive of using SNS (Wright et al., 2013). Through enhancing social support, SNS use reduced the level of depression (Shaw & Gant, 2002; Wright et al., 2013).

On the contrary, there were studies which suggested that SNS use contributed to depression. For example, studies found that the more the time spent on Instagram, the greater the chances of depression (Donnelly & Kuss, 2016), especially for those with high number of following strangers (Lup et al., 2015). In Steers et al. (2014), results also displayed that college students who spent more time on Facebook were more likely to develop depression. Furthermore, study in Greece also found that daily SNS usage was significant predictor of problematic SNS use, which predicted depression among young adults (Giota & Kleftras, 2013). Nevertheless, current study looked into how time spent on SNS contributes to depression, rather than the opposite direction.

Social Comparison

According to Festinger (1954), people have an innate need to evaluate their own abilities and opinions, termed self-evaluation; as well as to improve the self, termed self-enhancement, by employing others as standards for comparison. Social comparison can be made upward or downward, whereby the former means comparing with someone superior, while the

latter refers to comparing with someone inferior. When there was a threat to self-esteem, people tended to perform downward social comparison in order to protect their self-esteem (Wills, 1981). Outcomes of upward social comparison varied, whereby some gained useful information for self-improvement (Collins, 1996), some gained motivation (Buunk, Collins, Taylor, VanYperen, & Dakof, 1990), and some experienced lower self-esteem (Buunk et al., 1990; Morse & Gergen, 1970). As described in Swallow and Kuiper (1988), upward social comparison could contribute to depression as well, as it exaggerated negative self-worth and a sense of inferior in one ability.

In relating social comparison to SNS, researches had discovered that there were more upward social comparison and more envy, in which people who were envious tended to compare with someone better, when more time was spent on SNS (Gallinari, 2018; Tandoc Jr et al., 2015; Vogel et al., 2014) and when there was more passive SNS use (Wang, Wang, Gaskin, & Hawk, 2017). In other studies which measured social comparison in general using Iowa-Netherlands Comparison Orientation Measure (INCOM; Gibbons & Buunk, 1999), results also displayed that Facebook use was positively associated with more social comparison in general among university students (Steers et al., 2014; Zuo, 2014). The reason of why such results were found could be because SNS allowed people to perform self-evaluation more readily by making social comparison on this platform where people tended to idealize their profile presentation (Nadkarni & Hofmann, 2012; Vogel & Rose, 2016).

Depression and its association with social comparison was reported in some studies. In a quasi-experimental study, depressed participants rated themselves more inferior, and were more envious after viewing attractive profile of others, compared to non-depressed participants (Appel et al., 2015). Besides, Steers et al. (2014) found a significant relationship between social comparison on Facebook and

depression among male university students. Using SCRS (Allan & Gilbert, 1995) as a measure to social comparison, study found that more downward social comparison on Instagram was associated with lesser depression (Lup et al., 2015). Moreover, in studies examining Facebook, findings also displayed that upward social comparison resulted in increased in depression among university students, due to their high in envy (Tandoc Jr et al., 2015), and increased in rumination (Feinstein et al., 2013). In addition, similar result was found in a study conducted in Indonesia, whereby more upward social comparison on Instagram was associated with more depression (Gaol, Mutiara, Saraswati, Rahmadini, & Hilmah, 2018).

Upward social comparison was found to be the mediating factor between increased Facebook use and lower self-esteem (Vogel et al., 2014) and between increased SNS use and lower self-esteem as well as subjective well-being (Wang et al., 2017). Both these studies measured upward social comparison using only one or two items. Several studies also found that social comparison was a significant mediator in the relationship between SNS use and depression, in which spending more time on SNS was correlated with more social comparison, and in turn predicted greater depression (Niu et al., 2018; Steers et al., 2014; Tandoc Jr et al., 2015). Although in Tandoc Jr et al. (2015), Facebook envy, which was defined as a negative feeling when someone had something we wanted, was examined rather than social comparison, but envy is a feeling that arose from social comparison; nevertheless, measures on Facebook envy was self-generated, which a more psychometric sound measure would be better. Same goes to Niu et al. (2018), whereby only three items were adopted to measure upward social comparison. As for another study, although social comparison in general was examined using INCOM and suggested that any direction of social comparison was associated with depression (Steers et al., 2014), but study had suggested that people with depression could reduce such

feeling if they engage in downward social comparison (Gibbons, 1986). Besides, even upward social comparison could bring both positive and negative outcomes (Guyer & Vaughan-Johnston, 2018). Thus, it would be more meaningful to examine the direction of social comparison in understanding its effect on the relationship between SNS use and depression.

Studies on SNS in Malaysia

There were several studies conducted in Malaysia on topic of SNS, but these studies investigated addiction rather than SNS use (Cheak, Goh, & Chin, 2012; Jafarkarimi et al., 2016; Moghavvemi, Jaafar, Sulaiman, & Kasem, 2017; Sofiah et al., 2011; Zaremohzzabieh et al., 2014). Descriptive studies conducted among public universities reported that 47% of participants were addicted to Facebook using Bergen Facebook Addiction Scale (Jafarkarimi et al., 2016), whereas 18% and 20% of participants were addicted to Facebook and YouTube respectively, using Young's Internet Addiction Diagnostic Questionnaire (Moghavvemi et al., 2017). Zaremohzzabieh et al. (2014) qualitatively investigated Facebook addiction by conducting face-to-face semi-structured interview with nine postgraduate students who used Facebook for more than 38 hours for unnecessary purpose, and showed salience, tolerance, and conflict themes. In a focus group study, it was reported that Facebook addictive behavioral symptoms included salience, loss of control, withdrawal, and relapse, but whether the participants in this study were addicted to Facebook was unknown (Balakrishnan & Shamim, 2013).

Correlational studies were also conducted in Malaysia context. For example, in a study by Sofiah et al. (2011), results showed that there were five motives which were significant predictors of Facebook addiction among female university students, namely social interaction, passing time, companionship, communication, and entertainment. In another study, it examined whether social networking dependency and mood modification correlated

with online social networking addiction among university students, and found significant positive correlations (Cheak et al., 2012).

Although there was no study examining social comparison on SNS in Malaysia yet, there was one study in Malaysia which reported that information seeking on Facebook, such as checking out someone and learning about other people, was associated with decreased in psychological well-being among adolescents (Naeemi, Tamam, Hassan, & Bolong, 2014); this could possibly imply that when finding out about other person on SNS, it was unavoidable that social comparison was made, which perhaps negatively influenced one psychological well-being. Looking at the past studies in Malaysia relating to topic of SNS, most studies recruited university students as participants (e.g.: Jafarkarimi et al., 2016; Sofiah et al., 2011; etc.). Hence, current study focused on local university students in Cyberjaya to expand the understanding on SNS use among university students in Malaysia by

examining whether social comparison mediates the relationship between SNS use and depression.

Hypotheses

Following hypotheses were established.

H1: SNS use positively correlates with depression.

H2: SNS use positively correlates with upward social comparison.

H3: Upward social comparison positively correlates with depression.

H4: Relationship between SNS use and depression is significantly mediated by upward social comparison.

Conceptual Framework

The interest of present study was on examining the relationship between SNS use and depression, with upward social comparison as mediator. The conceptual framework of present study was illustrated in Figure 1.

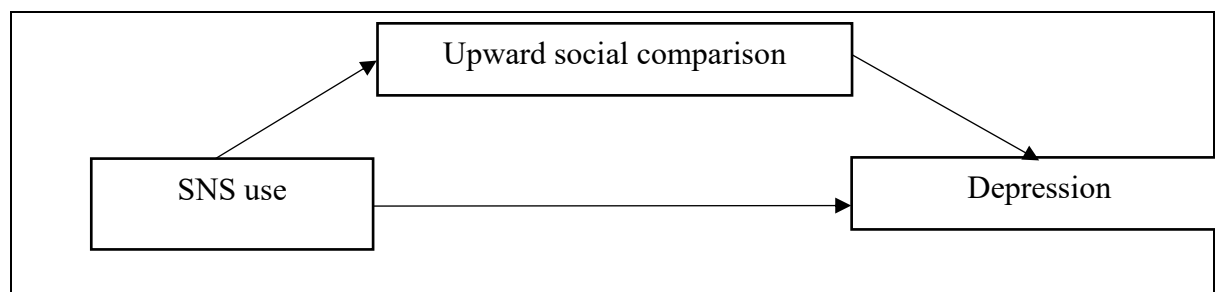


Figure 1. Conceptual framework in current study.

Methodology

Research Design

Current study adopted cross-sectional design with the aim of examining the relationship between SNS use, social comparison, and depression in Malaysia context. The independent and dependent variable were SNS use and depression respectively, while upward social comparison was identified as a mediator in present study.

Population and Sampling

Current study was conducted among local students at universities in Cyberjaya. Six universities in Cyberjaya were identified, but only three universities had given the permission for data collection purpose. Thirty students were recruited for pilot study in a university to determine the suitability of the scales used in current study. As for actual study, the sample size was estimated to be 144 (+20% attrition rate), by using Monte Carlo power analysis (Schoemann, Boulton, & Short, 2017), whereby approximately 120 participants are required to ensure statistical power is at least 80% for

detecting the hypothesized indirect effect. A total of 149 participants were recruited using purposive sampling method with inclusion criterion and several exclusion criteria. The inclusion criterion for current study was university students. Several exclusion criteria were established. Students who did not own any SNS account and international students were not recruited as participant, since current study aimed to investigate whether upward social comparison mediates relationship between SNS use and depression in Malaysia context. Besides, students aging under 18 years old were also excluded from participation as informed consent from parents will not be obtained.

Measures

Social Comparison Rating Scale (SCRS; Allan & Gilbert, 1995). SCRS was used to measure upward social comparison when using SNS. There are 11 bipolar constructs, whereby participants need to rate on these constructs based on a 10-point scale. Examples of constructs are “inferior/superior”, “left out/accepted”, and “unattractive/more attractive”. The instructions were modified as in Feinstein et al. (2013), from the original instruction “In relationship to others I feel ...” into “When I compare myself to others on social networking sites, I feel ...” Scores were reversed coded and summed so that higher scores mean more upward comparison with others. The possible score range is 11 to 110. In Feinstein et al. (2013), this scale showed good reliability, with Cronbach alpha of .94.

Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). CES-D was chosen to measure depressive symptoms in current study. There are 20 items in this scale, whereby each item is rated from 0 “rarely or none of the time” to 3 “most or all the time”. Examples of items include “I did not feel like eating; my appetite was poor”, “I felt lonely”, “I felt sad”, and others. Item 4, 8, 12, 16 are reversed scored and all scores were total upped, with possible scores ranging from 0 to

60 and higher scores indicating greater depressive symptoms. The cut-off score is 16 and greater, suggesting at risk for clinical depression. The reason of selecting this scale was because of its good internal reliability of .85 demonstrated among college students (Radloff, 1977).

Demographic information. Participants age, sex, race, religion, marital status, level of education, SNS use and type of SNS used were asked. SNS use was assessed using an open-ended question “How long on average do you spend (in hour) per day on SNS?”, as in study by Steers et al. (2014).

Malay version of questionnaires. Malay version of questionnaires were prepared and incorporated into English version of questionnaires by italicizing Malay translation below English version. SCRS were translated into Malay language using back translation. As for CES-D, it had already been translated and validated among female inmates in Malaysia setting, with an internal consistency of .75 (Mazlan & Ahmad, 2014).

Procedure

Pilot study was carried out prior to the actual study to determine the psychometric soundness of the measures that were adopted in actual study. In both pilot study and actual study, participants were briefed about the purpose of current study, their rights to participate and withdraw, confidentiality, as well as the procedure, and informed consent was given. Besides, they were also told that they can leave an email on the informed consent if they wish to know their results. After obtaining informed consent, they were given a questionnaire which consists of three sections, namely demographic information, SCRS, and CES-D. After they have completed, questionnaire was returned to researcher. All data collected will be analyzed collectively using IBM SPSS Statistic 20.

Ethics and Ethical Approval

Ethical approval was obtained from Research Ethics Review Committee (CUCMS/CRERC/ER/219). Current study was expected to be at minimal risk. Paper-and-pencil survey was used to collect data required. Participants may experience emotional discomfort when answering questions about depression, but such discomfort was expected to go off immediately. None of the participants personal identity was obtained, but their email was required if they were interested in their results. All data collected was analysed collectively. Participants were briefed about present study and were given an informed consent before answering questionnaire. No deception was involved, and participation was voluntary. All answered questionnaires will be stored in a locked cabinet, while softcopy data will be kept in a password-protected laptop for

at least five years before they are being properly discarded.

Results

Pilot Study

In pilot study, 9 males and 21 females were recruited (N=30). Participants recruited comprised of 17 Malays, 6 Chinese, 5 Indians, a Chindian and a Kadazan. Refer to Table 1 for the descriptive statistic in pilot study. Reliability analysis was run to determine the reliability of SCRS and CES-D. Analysis had shown good reliability in both SCRS ($\alpha = .89$) and CES-D ($\alpha = .91$). Thus, results from pilot study had implicated that the scales used had appropriate psychometric soundness and were suitable to be used in actual study.

Table 1 Descriptive Statistic of Demographic Variables, SNS Use, SCRS and CES-D (N=30)

Variables	n	%	M	SD
Age			20.27	1.8
Religions				
Islam	17	56.7		
Buddha	5	16.7		
Christian	3	10.0		
Hindu	4	13.3		
Other	1	3.3		
Marital Status - Single	30	100		
Education				
Foundation	6	20.0		
Diploma	16	53.3		
Degree	8	26.7		
Types of SNS used				
Facebook	15	50.0		
Instagram	26	86.7		
Twitter	11	36.7		
LinkedIn	1	3.3		
Snapchat	8	26.7		
Whatsapp	30	100		
WeChat	4	13.3		
Others	7	23.3		
SNS use (hour)			3.55	1.45
SCRS			61	15.3

CES-D

18.30

9.79

^a The other types of SNS include Tiktok, Telegram, Wattpad, and YouTube.

Actual Study

About 73 males and 75 females, aging from 18 to 27 years old (M = 20.84, SD = 1.77), participated in the actual study. Self-report of participants displayed that the hour spent on SNS ranged from 0.2 hours to 24 hours, but most participants reported of 5 hours-time spent

on SNS. Majority of participants used Whatsapp and Instagram, followed by Facebook and Twitter. More descriptive statistic on demographic information and relevant variables were demonstrated in Table 2.

Table 2 Descriptive Statistic of Demographic Information, SNS Use, SCRS and CES-D (N=149)

Variables	n	%	M	Median	SD
Race*					
Malay	68	45.6			
Chinese	42	28.2			
Indian	29	19.5			
Others ^a	9	6			
Religion*					
Islam	71	47.7			
Buddha	28	18.8			
Christian	22	14.8			
Hindu	26	17.6			
Sikh	1	0.7			
Marital Status – Single*	148	99.3			
Educational Level*					
Foundation	23	15.4			
Diploma	34	22.8			
Degree	88	59.1			
Master	3	2			
Types of SNS used*					
Facebook	77	51.7			
Instagram	129	86.6			
Twitter	72	48.3			
LinkedIn	17	11.4			
Snapchat	39	26.2			
Whatsapp	143	96			
WeChat	22	14.8			
Skype	9	6			
Line	5	3.4			
Others ^b	35	23.5			
SNS use (hours)*			4.98	4	3.68
SCRS			61.64	61.5	15.45
CES-D			19.53	17	9.9

* indicates there are one missing value

^a Other races include Kadazan, Iban, Bidayuh, Caucasian, Melanau and Punjabi.

^b Other types of SNS used include Discord, Pinterest, Tiktok, YouTube, Telegram and Twitch.

Prior to statistical analysis, normality test was run, and results showed that data was not normally distributed. A Spearman correlation was computed to assess the correlation between SNS use and depression (H1); SNS use and upward social comparison (H2); as well as upward social comparison and depression (H3) respectively. As to find out whether upward social comparison mediates the relationship between SNS use and depression (H4), PROCESS macro, Model 4, was adopted.

The results of Spearman correlation showed that there was no significant correlation between SNS use and depression, $r_s(145) = .11$, $p = .19$; as well as between SNS use and upward social comparison, $r_s(145) = .08$, $p = .36$. Thus, there were no sufficient evidence to support H1 and H2. On the other hand, significant positive correlation was found between upward social comparison and depression, $r_s(143) = .38$, $p < .001$, supporting H3. The more the upward social comparison, the greater the depressive symptoms and vice versa. Table 3 summarized Spearman correlation results.

Table 3 Spearman Correlation between SNS Use, Upward Social Comparison and Depression

	Correlation coefficient	p-value
SNS use & depression	.11	.19
SNS use & upward social comparison	.08	.36
Upward social comparison & depression	.38**	<.001

Figure 2 illustrated that the standardized regression coefficients between upward social comparison and depression was statistically significant, but not in between SNS use and upward social comparison. The indirect effect was $(.32)(.24) = .08$. To test out the standardized indirect effect, bootstrapping procedure was performed. Unstandardized

indirect effects were computed for each of 1000 bootstrapped samples, and the 95% confidence interval was computed. There was no significant indirect effect of SNS use on depression through upward social comparison, $ab = .08$, BCa CI $[-.07, .28]$. No sufficient evidence was found to support H4.

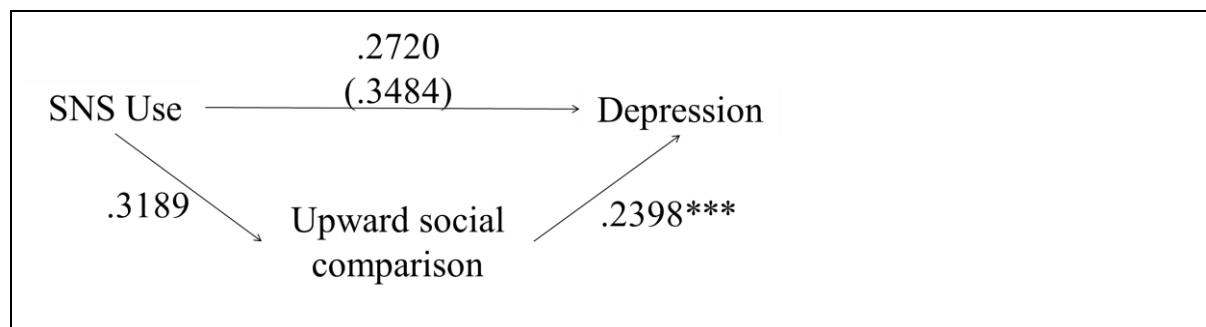


Figure 2. Standardized regression coefficients for the relationship between SNS use and

depression as mediated by upward social comparison. The standardized regression

coefficients between SNS use and depression, controlling for upward social comparison, is in parentheses.

*** $p < .001$

Discussion

The aim of present study was to explore the relationship between SNS use, depression, and upward social comparison. Hypotheses were established, whereby SNS use positively correlates with depression (H1); SNS use positively correlates with upward social comparison (H2); upward social comparison positively correlates with depression (H3); and relationship between SNS use and depression is significantly mediated by upward social comparison (H4). Significant finding was only revealed in the relationship between upward social comparison and depression, supporting H3. There was no evidence to support other hypotheses in present study.

Several factors were discussed to better understand current results findings. Results from present study showed that relationships between SNS use and depression as well as SNS use and upward social comparison were not statistically significant. This contradicted with past studies which reported a significant relationship between SNS use and depression (Vidal, Lhaksampa, Miller, & Platt, 2020; Lup et al., 2015; Lin et al., 2016; Steers et al., 2014) as well as SNS use and upward social comparison (Steers et al., 2014; Tandoc Jr et al., 2015; Zuo, 2014). One of the reasons that could explain current results could be relating to the purpose of using SNS. Some people use SNS to share information or personal knowledge, to build social connection, to strengthen current relationship, or to seek enjoyment (Salehan, Kim, & Kim, 2017). When these are the main motivations of people using SNS, the chances of making upward social comparison and subsequently developing depressive symptoms could be minimal when they were using SNS. For instance, research had found that people who use Instagram with the purpose to keep in touch with friends will be at lesser risk to these negative consequences (Lup et al., 2015).

Furthermore, how people use SNS could also contribute to the reason why significant relationships were not found between SNS use and depression as well as SNS use and upward social comparison. Some researchers investigated active use and passive use of SNS as variables (Seabrook et al., 2016). Active use of SNS refers to interacting with others on SNS; while passive use of SNS refers to browsing on SNS. The latter was found to be significantly related to upward social comparison and lower subjective well-being (Wang et al., 2017). Systematic review had also reported that passive use of SNS was significantly correlated with upward social comparison and depression (Seabrook et al., 2016), whereas active use yielded positive outcomes, such as perceived social support (Vidal et al., 2020). This could imply that merely screening on time spent on SNS was insufficient to explore how SNS contributes to depression (Vidal et al., 2020), but how people use it might provide more clues into this question.

In addition, different types of SNS could also explain current results whereby no significant results were obtained between SNS use and depression as well as SNS use and upward social comparison. SNS could be differed from one another in nature, such as Whatsapp is a mobile messaging site allowing users to connect with others via messages; Facebook allows users to represent themselves virtually using profiles and wall posts; Twitter can serve as microblogging; Instagram is a picture-sharing site, whereas Youtube is a video-sharing site (Kuss & Griffiths, 2017). Study by Panger (2014) reported that Facebook users were more likely to show more envy, report lower life satisfaction and more depression when compared to Twitter users. Besides, past study had revealed that only Instagram use significantly predicted SNS addiction and depression, but not for Facebook, Twitter and Snapchat (Donnelly & Kuss, 2016). This suggested that not all SNSs bring the same potential effects due to their nature differences. People may spent a lot of time on different SNS,

but it could not mean that people will be more likely to make upward social comparison nor developing depressive symptoms, as it relates back to motivation of people using SNS and thus the type of SNS used.

Another reason of why no significant results to support H1, H2, and H4 is related to individual differences. There was several confounding that could be significant in understanding current results. For instance, positive self-esteem (Apaolaza, Hartmann, D'Souza, & Gilsanz, 2019; Bergagna & Tartaglia, 2018; Lee, 2014), perceived social support (Burke & Kraut, 2016), high coping skills (Brand, Young, Laier, Wölflin, & Potenza, 2014), and mindfulness (Apaolaza et al., 2019), which were shown to be a protective factor towards SNS use and depression. Besides, past study found that women who were high in comparison tendency spend more time on Facebook (Fardouly, Diedrichs, Vartanian, & Halliwell, 2015), suggesting one's comparison tendency as another individual difference that might explain the nonsignificant relationship between SNS use and upward social comparison. Therefore, these individual factors might explain why current study found no significant relationship between SNS use and depression as well as SNS use and upward social comparison.

On the other hand, relationship between upward social comparison and depression was found to be statistically significant, meaning that when more upward social comparison was made while using SNS, chances of depressive symptoms will also increase and vice versa. This finding was consistent with previous studies (Appel et al., 2015; Feinstein et al., 2014; Gallinari, 2018; Tandoc Jr et al., 2015). Besides, a meta-analysis study had suggested that upward social comparison on SNS was more strongly related to depression than time spent on SNS (Yoon, Kleinman, Mertz, & Brannick, 2019). The underlying mechanism between upward social comparison and depression might be related to self-esteem. Past studies had revealed that SNS

use often triggers upward social comparison; when people engaged in upward social comparison, such as in term of number of likes and comments or achievement, it was likely to result in lower self-esteem, which was closely associated with depression (Appel et al., 2015; Krause, Baum, Baumann, & Krasnova, 2019; Vogel et al., 2014; Zuo, 2014). Other than self-esteem, rumination was also found to be significantly mediating the relationship between upward social comparison on Facebook and depression (Feinstein et al., 2013). In fact, upward social comparison made on SNS was a significant risk factor to depression (Seabrook et al., 2014). Significant relationship between upward social comparison and depression was found in present study, and the underlying process could be related to self-esteem and rumination.

Limitations and Recommendations for Future Study

There were several limitations in present study. Firstly, purposive sampling method was considered as one of the limitations as it could potentially create a biased sample. With this sampling method, results found from present study can only be generalized to local university students in Cyberjaya. Generalizing present results findings to other population required cautious consideration as the characteristics of the targeted sample may be different. Hence, it is recommended to adopt random sampling method in future study to minimize the chances of obtaining biased sample. Replication of study using different sample, such as working adults, adolescents, and others, is also recommended to improve the representativeness of results findings. Secondly, present study only measured SNS use in term of time spent in general. Although past studies used the same type of measure, but they only focused on Facebook or Instagram rather than SNS in general (Lup et al., 2015; Tandoc Jr et al., 2015). Future study can consider measuring time spent on each SNS that participants used as different nature of SNS might create

different impact on users. Nevertheless, it is also recommended to measure not only the quantity but the quality of SNS use, such as passive and active use of SNS (Vidal et al., 2020).

Thirdly, current study adopted cross-sectional design and did not establish a causal relationship between upward social comparison and depression, but only correlational relationship can be made. Hence, it is important to note that current findings did not demonstrate that upward social comparison resulted in depression, but when making in more upward social comparison, chances of having depressive symptoms would be higher and vice versa. Perhaps, future study can adopt experimental study by manipulating time spent on SNS on depressive symptoms in order to understand their causal relationship. Longitudinal study would also be recommended to examine how SNS use can affect one's mental health and determine factors that are significant in understanding SNS use and mental health. Lastly, self-report method questioned the validity of data to some extent due to social desirability. Replication of study is recommended so that more evidence could be gathered and thus strengthening the validity of results findings.

Conclusion and Implication

In summary, present study found significant positive relationship between upward social comparison and depression, meaning when people make more upward social comparison on SNS, it increases the chances of developing more depressive symptoms. Besides, upward social comparison was evident in the context of SNS, but no sufficient evidence was found in the relationship between SNS use in term of time spent and upward social comparison. Nevertheless, current result findings could imply that the experience that people underwent when using SNS played a more crucial role in associating with depression rather than how much time was spent on SNS. SNS undeniably played an important role in today era and had brought a lot of benefits to the society, but the

fact that some are affected by SNS use in a negative way shall not be neglected. In term of clinical implication, practitioners can focus on the cognitive aspect when depression was strongly influenced by SNS as it could be due to their negative perception about self when compared with others on SNS. Psychoeducation on SNS use and upward social comparison could also be considered during intervention plan as to educate people on how to use SNS wisely and how to make comparison with others in a more helpful manner.

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