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THE RELATIONSHIP BETWEEN SOCIAL MEDIA USE AND DEPRESSION IN COLLEGE STUDENTS: A SCOPING REVIEW

by

SUSAN WU, BS

APPROVED:

ACADEMIC ADVISOR AND CULMINATING EXPERIENCE SUPERVISOR
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by
Susan Wu, BS, MPH
2019

THE RELATIONSHIP BETWEEN SOCIAL MEDIA USE AND DEPRESSION IN COLLEGE STUDENTS: A SCOPING REVIEW

by

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in Partial Fulfillment

of the Requirements

for the Degree of

MASTER OF PUBLIC HEALTH

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May, 2019

THE RELATIONSHIP BETWEEN SOCIAL MEDIA USE AND DEPRESSION IN COLLEGE STUDENTS: A SCOPING REVIEW

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Background: In 2017, 17.3 million adults in the U.S. (7.1% of all U.S. adults) have had at least one major depressive episode, with individuals ages 18-25 having the highest prevalence of major depression at 13.1%. Studies have looked at the association between social media (SM) use and depression with mixed findings. The goal of this research is to conduct a scoping review of existing evidence for the relationship between SM use and depression among college students.

Methods: Searches for articles published in the scientific literature were performed on PubMed, Embase and Scopus. Articles selected followed an inclusion criteria: studied SM use and depression in college students over 18 years, were written in English, were published between October 2013 and October 2018, studied time spent on SM, addiction to SM and/or different SM behaviors and were cross-sectional, observational, longitudinal or intervention studies. Articles were screened and imported into citation manager Refworks for duplicate removal. Full-text articles were found through Pubmed, Embase, Scopus or Google Scholar for eligibility screening. Articles needing to be purchased were requested through interlibrary loan or requested from authors.

Results: 14 articles met inclusion criteria; 92.9% were cross-sectional. Half of the articles measured time spent on SM (including daily hours and frequency), with mixed findings; 42.9% of articles studied SM addiction, with all studies presenting a significantly positive association with depression. Over sixty percent (64%) of the articles studied specific SM behaviors, with mixed findings. Included articles presented a larger correlation between individual characteristics (e.g. neuroticism, loneliness, suicidal ideation, self-esteem and academic stressors) and SM addiction and depression than time spent on SM and SM behaviors. The odds of SM addiction and depression were 40% higher in college students in China than in the U.S and the risk of SM addiction and depression in college students was found to be 28% higher in Hong Kong (HK)/Macau and 12% higher in Japan than in the U.S. Only one randomized controlled trial was identified in this scoping review. After 2 weeks, statistically significant reductions were observed in both SM addiction and depression through mean rank comparisons of before and after treatment.

Conclusion: This review reiterated the need for longitudinal studies to access directionality and the need to standardize measures used to measure social media, depression in college students. Future studies could continue to focus on the relationship between individual characteristics (i.e. loneliness, neuroticism and self-esteem), SM addiction, SM comparison and depression and further study RCTs utilizing treatment periods longer than 2-weeks.

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BACKGROUND

Literature Review

Depression

In the United States, between 2009 and 2012, 7.6% of people ages 12 and older had self-reported depression, with depression defined as a serious medical illness with mood, cognitive, and physical symptoms (Depression in the U.S. Household Population, 2014). According to the National Institute of Mental Health, major depression is defined as one of the most common mental disorders in the United States, and for some individuals, can result in severe impairments that interfere with or limit one's ability to carry out major life activities (Major Depression, n.d.). In 2017, 17.3 million adults (7.1% of all U.S. adults) have had at least one major depressive episode, with individuals ages 18-25 having the highest prevalence of major depression at 13.1% (Major Depression, n.d.). Depression is the leading cause of disability worldwide, and is a major contributor to the overall global burden of disease (Depression, 2018[b]). Decreased energy or fatigue, loss of interest or pleasure in hobbies and activities and difficulty concentrating, remembering, or making decisions are only some of the signs and symptoms an individual who is depressed might experience (Depression, 2018[a]). In addition, Health Direct states "Good mental health is more than just the absence of mental illness. A positive state of wellbeing includes feeling good and functioning well (Good Mental Health, 2017)." To promote mental and emotional well-being, the Surgeon General recommends "facilitating social connectedness and community engagement across the lifespan" and "building strong, positive relationships with family and friends (Mental and Emotional Well-being, n.d.)."

Social Media

Merriam-Webster (2004) defines social media as "forms of electronic communication (such as websites for social networking and microblogging) through which users create online communities to share information, ideas, personal messages, and other content (such as videos) (Social Media, 2004)." With the popularity of social media applications (i.e. Facebook, Twitter, Instagram, Snapchat and Youtube) (Smith & Anderson, 2018), people are now able to see status updates of those they follow, which may generate feelings such as "fear of missing out" (FoMO) or becoming envious (Zimmerman, n.d.). However, because users are also able to modify their picture by using apps such as photoshop to "beautify" themselves, social media does not always portray reality (Holland & Tiggemann, 2016). In 2018, about 88% of Americans 18-29 years-old have indicated that they use a form of social media. Facebook is used by a majority of Americans; however, Americans ages 18 to 24 are more likely to use Snapchat, Instagram and Twitter (Smith & Anderson, 2018). Social media has been used for retrieving information (Tang, Bie, Park & Zie, 2018), for intervention to promote positive behaviors (Hsu, Rouf & Allman-Farinelli, 2018), and for social support (Klassen, Douglass, Brennan, Truby & Lim, 2018). Social media can also be used for individual entertainment, maintaining relationships or occupying time, however, it can become an addiction developed from feeling better or more self-assured when using social media (Guedes et. Al, 2016).

Social Media and Depression

When studying social media's relationship with mental health outcomes such as depression, findings suggest mixed results. The relationship is complex and may involve multiple

psychological, social, behavioral and individual factors (Baker & Algorta, 2016). Whether social media is beneficial or harmful to mental health and well-being may partly depend on the quality of social factors in the social network site's (SNS) environment (Seabrook, Kern & Rickard, 2016). When studying child and adolescent populations, studies have been consistent in the relationship between cyberbullying and depression (Hamm et al., 2015). Among the Lesbian, Gay and Bisexual (LGB) community, social media has been seen to be both a protective (due to easing geographic isolation and loneliness) and a risk factor (from negative experiences such as cyberbullying) for depression (Escobar-Viera et. al, 2018). In 18-to-29-year-olds, it has been found that positive social comparison was significantly negatively associated with depressive symptoms (Lup, Trub & Rosenthal, 2015). A study has shown an increased odds of depression in participants spending more time on social media and "Based on uses and gratification theory, media used in a goal-directed way for individual gratification and satisfaction has similarities with addiction (Lin, 2016) (Kuss & Griffiths, 2011)." Griffiths defines addictive behavior as being characterized by six core components of addiction: salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse and any behavior that fulfills these six criteria can be considered as an addiction, including social networking (Guedes et al., 2016). Further research is needed because of the high prevalence of social media usage (Smith & Anderson, 2018) and high rates of depression in young adults (Depression, 2018[a]), with depression as the most common health problem for college students (Depression and College Students, n.d.). A scoping review can assess the potential size and scope of the available research literature with aims to identify the nature and extent of current research (Grant & Booth, 2009). A scoping review on the literature relating social media use and depression in college students in the last 5 years

(October 2013 – October 2018) was conducted to describe the association between time, social media (SM) addiction and/or different behaviors on social media and depression and assist in determining if a systematic review on this topic might be possible.

Public Health Significance

This scoping summarization of depression and social media usage in college students ages 18-25 has a public health significance with the following aspects: 1) college students between 18 and 25 are a large population; according to the National Center for Education Statistics, was projected to be 3.2 million in 2018 (Digest of Education Statistics, 2017), 2) in 2018, 18-to-29-year-olds have the highest percentage using any form of social media (88%) (Smith & Anderson, 2018), 3) in 2016, this age group was listed as having the highest prevalence of depression (Depression, 2018[a]), 4), while they are more mature than adolescents, their brains are still developing (Brain Maturity Extends Well Beyond Teen Years, 2011), 5) depression can lead to difficulties with concentration (Depression, 2018[b]), and 6) students generally need their memory to study and retain learned material. With young adults ages 18-25 having the highest prevalence of an episode of major depression in the US in 2016 (Depression, 2018[a]), this study seeks to describe the association between social media and depression specifically in college students to provide insight on the focus of future studies to guide intervention and policy development.

Hypothesis, Research Question, Specific Aims or Objectives

The research questions are: 1) What is the relationship between time on social media and depression in college students? 2) Does social media addiction have a positive correlation with depression? and 3) What types of social media behaviors are positively correlated with depression? Studies have determined an association between social media usage and depression. Different aspects of social media having been studied among young adults (Seabrook, Kern & Rickard, 2016) such as 1) the association between real-life closeness of social media contacts (Shensa et al. et al., 2018), 2) actual and perceived support (Park et al. 2016) or 3) negative Facebook experiences (Rosenthal et al., 2016) and depression. This proposal seeks to perform a scoping review of literature that explores the relationship between 1) time spent on social media 2) social media addiction and 3) social media behaviors and depression in college students 18-25.

METHODS

Search Strategy

A modified version of the 14 review steps by the Joanna Briggs Institute was implemented (Training, 2017). Electronic searches were performed using the following health databases: PubMed, Embase and Scopus. Searches for articles on the three health databases took place in January 2019 for articles published within the last five years (October 2013 – October 2018). The main search terms were based on ‘social media’, ‘depression’ and ‘college’ where social media was defined according to Merriam-Webster’s definition above and depression was defined according to the National Institute of Mental Health as a common, but serious mood disorder

which can cause severe symptoms that affect feeling, thinking and handling daily activities such as sleeping, eating or working (Depression, 2018[b]). The terms used in the search are shown in table 1. Searches were performed for each key concept, with Boolean operator "OR" separating each term. Key concepts were then all combined using "AND " Boolean operator.

Table 1 Search terms used for the scoping review by main key concepts

Social Media	Depression	College
Facebook	Depressive disorder	Undergraduate
Instagram	Mental health	University
Reddit	Depression/diagnosis	College
Linkedin	Depression	Students
Twitter		
Snapchat		
Social media addiction		
Social network		
Problematic social media use		
Social networking sites		
Social comparison		
Social media utilization		
Social desirability		
Social media		

Eligibility Criteria

The articles included meet the eligibility criteria presented in table 2. Because studies have shown consistent findings of cyberbullying and depression, articles that focused on victims of cyberbullying and depression were excluded from this study (Hamm et al., 2015 & Bottino et al., 2015). Articles not accessible through open access or interlibrary loan or could not be retrieved from the author and have not been published within the October 2013 – October 2018 were also excluded.

Table 2 Study inclusion/exclusion criteria of articles for this scoping review on social media and depression in college students

Criteria	Inclusion	Exclusion
Articles	Written in English Published within the last 5 years Any geographic location	Not written in English
Study participants	College students 18 and over Uses social media platforms such as Facebook, Instagram, Twitter and Snapchat	Studies that are broad, not focusing on social media platforms (i.e. handheld device or including searching the web), depression or college students
Study design	Cross-sectional, observational, longitudinal and intervention studies	Editorials, commentaries and systematic reviews
Study Outcomes	Depression or the like Depression symptoms can include both Physician diagnosed as well as self-diagnoses Depression is measured as a scale or categorized as yes/no	Articles focused on other mental health outcomes other than depression such as suicides or anxiety, where depression is not an outcome
Variables	Time on social media Addiction to social media Different types of social media behaviors (posting content, status updates, aimless scrolling, counting likes, supporting others and bullying others)	Articles focusing on victims of cyberbullying Articles that do not include independent variables associated with outcome variables

Articles generated from searches were screened through article title and abstract on each health database. Articles that did not meet inclusion criteria were not selected for full text screening. Articles that required a full text screening were selected and imported into the citation manager, RefWorks in folders named according to the heath database in which the article populated (i.e. Pubmed, Scopus or Embase). Articles that were duplicates were identified through RefWorks

once articles were imported and removed prior to in-text screening. The option to view articles, if accessible was available in Refworks for articles imported from Scopus or Pubmed. Full-text for articles imported from Embase were searched through Google Scholar or Pubmed. Five articles were not directly accessible and needed to be paid for. An attempt was made to retrieve said articles through interlibrary loan; however, no response was received after two weeks. Full text was requested from the first author of the five articles through e-mail. Four articles were e-mailed back for full-text screening with one article meeting inclusion criteria. Articles meeting inclusion criteria after in-text screening were saved as a PDF and remaining articles were deleted from the RefWorks database. Excluded articles from in-text screening were documented in an excel spreadsheet. The numbers of articles included and excluded through the in-text screening process was documented as well as the reasoning for exclusion in a flow diagram according to PRISMA guidelines (figure 1). This scoping review used published articles and was approved for exemption by the Committee for the Protection of Human Subjects (CPHS) of UTHealth (HSC-SPH-18-1030).

Documentation of Results

Four separate charting forms were developed to record the characteristics of included articles. The first charting form included the author and published year of the article, the type of social media used/studied, the population of study (including country), sample size of the study, age range or mean age of the students included in the study and study design. The second charting form recorded how measurements were operationalized for social media and how measurements was operationalized for depression. The third charting form included the author's last name,

publication year, social media measurement, depression measurement, the statistics of association between the two measurements (i.e. odds ratios, risk ratios, mean rank, regression coefficients and/or correlation coefficients) and whether the association showed a positive correlation between social media and depression. Asterisks indicated the significance of the statistic (one asterisk indicating <0.05 and two asterisks indicating <0.01). Other factors with moderate correlations were included in this table. The final charting form listed what was associated with depression, if the association was negative or positive and whether findings were significant. These charting forms were used to assist in tallying results. Proportions of articles exploring the associations between social media and depression are reported.

RESULTS

About 43% of the articles included populations in Asia (Singapore, South Korea, China, Hong Kong, Taiwan, Japan and India) (Jang, Park & Song, 2016, Tang, Koh & Gan, 2017, Tang & Koh, 2017, Zhang, 2017, Barman, Mukhopadhyay & Bandyopadhyay, 2018 & Tang et al., 2018) (see table 3). Over a quarter (29%) of articles included other counties (Greece, Iran, Israel and Mexico) (Kokkinos & Saripanidis, 2017, Rad & Ahmadi, 2018, Jasso-Medrano & Lopez-Rosales, 2018 & Turel, Poppa & Gil-Or, 2018). Most (93%) of the articles were cross-sectional. Over a fifth (21%) of articles had participants that were randomly selected (Zhang, 2017, Barman et al., 2018 & Rad & Ahmadi, 2018). Half (50%) of the articles included participants whose age in years ranged from 18-25 (Jang et al., 2016, Tang et al., 2017, Tang & Koh, 2017, Zhang, 2017, Barman et al., 2018, Choukas-Bradley, Nesi, Widman & Higgins, 2018 & Jasso-Medrano & Lopez-Rosales, 2018), 14% included participants with ages ranging from 18-30 (Rad

& Ahmadi, 2018 & Tang et al., 2018), 14% included students over age 30 (Kokkinos & Saripanidis, 2017 & Kircaburn et al., 2018) and 21% of articles did not mention a maximum age (Lauckner, Hill & Ingram, 2018, Shensa et al., 2018 & Turel et al., 2018). Half (50%) of the articles focused on or included Facebook as their type of social media (Jang et al., 2016, Kokkinos & Saripanidis, 2017, Zhang, 2017, Choukas-Bradley et al., 2018, Jasso-Medrano & Lopez-Rosales, 2018, Lauckner et al., 2018 & Turel et al., 2018) and half (50%) used social networking sites in general (Tang et al., 2017, Tang & Koh, 2017, Barman et al., 2018, Rad & Ahmadi, 2018, Kircaburn et al., 2018, Shensa et al., 2018 & Tang et al., 2018). Instagram and Twitter were also popular forms of social media and were each included in 21% of selected articles (Choukas-Bradley et al., 2018, Rad & Ahmadi, 2018 & Lauckner et al., 2018) (see table 3).

Social media measurements

Over a tenth (14%) of articles estimated the amount of time on social media using measurements (7% used a 6-point frequency response scale (Kokkinos & Saripanidis, 2017) and 7% used free response, in which participants were asked the average number of hours and minutes spent using any social media on a typical day (Choukas-Bradley et al., 2018)). To measure social network addiction, 29% of articles used a modified 6-item Bergen Facebook Addiction Scale (BFAS) (Tang et al., 2017, Tang & Koh, 2017, Tang et al., 2018 and Turel et al., 2018), 7% used a different version of an addiction scale (seven-dimension online social networking addiction scale) (Esmaeili, 2018) and 7% used a social network addiction questionnaire (Jasso-Medrano & Lopez-Rosales, 2018). Over a tenth (14%) of articles asked questions about Facebook use with

answers based on a 5/6-point scale (Jang et al., 2016 & Zhang, 2017) and 14% used a questionnaire about use of social networking sites (Barman et al., 2018 & Kircaburn et al., 2018). Less than half (43%) of articles used measurements specific to social media behaviors (i.e. social comparison on Facebook, impression management, enacted social support, self-disclosure, body comparison, body surveillance, cyberbullying offending, social network intensity and real-life closeness of social media contacts) (Jang et al., 2016, Zhang, 2017, Choukas-Bradley et al., 2018, Kircaburn et al., 2018, Laukner, 2018 & Shensa et al., 2018) (see table 5).

Depression measurements

Most included articles (86%) measured depression; 7% measured mental health (Jang et al., 2016) and 7% measured well-being (Turel et al., 2018). There were various depression measurements. The 9-item patient health questionnaire (PHQ-9) (21%) (Kokkinos & Saripanidis, 2017, Zhang, 2017 & Lauckner et al., 2018) and variations of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (21%) (Tang et al., 2017, Tang & Koh, 2017 & Tang 2018) were the most popular. The Becks Depression Inventory (BDI) was used in 14% of articles (Barman et al., 2018 & Rad & Ahmadi, 2018). The Center for Epidemiologic Studies Depression Scale (CES-D), 4-item patient reported outcomes measurement information system (PROMIS), short mood and feelings questionnaire and short depression-happiness scale were each used in 7% of articles (Jasso-Medrano & Lopez-Rosales, 2018, Choukas-Bradley et al., 2018, Kircaburn et al., 2018 & Shensa et al., 2018).

Findings

Time spent on social media

Half (50%) of included articles studied the relationship between time spent on social media and depression or well-being (Kokkinos & Saripanidis, 2017, Zhang, 2017, Barman et al., 2018, Choukas-Bradley et al., 2018, Rad & Ahmadi, 2018, Jasso-Medrano & Lopez-Rosales, 2018 & Turel et al., 2018) with a majority (71% of articles studying time) measured using correlation to determine a positive or negative correlation with depression (i.e. correlation matrix, Spearman's rho, bivariate correlation and zero-order correlation) (Kokkinos & Saripanidis, 2017, Zhang, 2017, Choukas-Bradley et al., 2018, Jasso-Medrano & Lopez-Rosales, 2018 & Turel et al., 2018) (see table 5); the remaining articles studying time on SM used mean rank comparing less than or equal to 4 hours or greater than four hours or comparing time and depression before and after treatment (Barman et al., 2018 & Rad & Ahmadi, 2018). Mean rank scores were correlations between time spent on social media (including daily hours and daily frequency) and depression and did not exceed 0.17 (see table 5). These correlations were relatively low compared to other factors measured and the relationship between time on social media and depression in college students could not be determined (see table 5).

Social media addiction

About half of included articles (43%) studied social media addiction with definitions including stated ability to spend a day without SNS or terminology associating addiction with social media use and all articles showing positive associations (Tang et al., 2017, Tang & Koh, 2017, Barman et al., 2018, Jasso-Medrano & Lopez-Rosales, 2018, Tang 2018 & Turel et al., 2018). One third

of articles studying SM addiction and depression in college students compared US SM addiction and depression rates in college students with other countries through regression, odds ratios or relative risk (Tang et al., 2017 & Tang et al., 2018). Articles that reported significantly higher risks/odds of depression with social media addiction were in China, Hong Kong/Macau and Japan when compared with the United States. One third (2/6) of articles studying SM addiction and depression or well-being used a correlation matrix or Spearman's rho with a moderate correlation (-0.57) found between SM addiction and well-being (Jasso-Medrano & Lopez-Rosales, 2018 & Turel et al., 2018). One third of articles studying SM addiction used other measures (comorbidity and mean rank) (Tang & Koh, 2017 & Barman et al., 2018) and one third found SM addition and depression in college students more common in females than males (Tang et al., 2017 & Tang & Koh, 2017). Findings from this scoping review suggest a positive correlation between social media addiction and depression in college students (see table 5).

Social media behaviors

SM behaviors were studied in 64% of included articles (Jang et al., 2016, Lauckner et al., 2018, Shensa et al., 2018, Zhang, 2017, Kokkinos & Saripanidis, 2017, Choukas-Bradley et al., 2018, Kircaburn et al., 2018, Barman et al., 2018 & Turel et al., 2018). Impression management, Facebook (FB) use, social comparison, enacted social support on FB, indiscreet FB content, Facebook victimization, self-disclosure, amount/intimacy, honesty, intent, body surveillance, body comparison, cyberbullying perpetration, problematic social media use, FB network size and use of FB privacy settings were all measured using variations of correlation measures (i.e. zero-order, bivariate, Pearson or Spearman's rho correlations or through a correlation matrix) with

depression/mental health/well-being (Jang et al., 2016, Zhang, 2017, Kokkinos & Saripanidis, 2017, Choukas-Bradley et al., 2018, Kircaburn et al., 2018 & Turel et al., 2018). Problematic SM use, FB victimization, body surveillance, body comparison, cyberbullying perpetration and comparing oneself on SM were SM behaviors showing the highest correlations with depression, 0.37 being the highest and all showing significantly positive findings (Kircaburn et al., 2018, Kokkinos & Saripanidis, 2018, Choukas-Bradley et al., 2018 & Jang et al., 2016). Other measures used to compare social media behaviors include regression, odds ratios and mean rank and measured excessive social media use, no/distant/close face-to-face (FTF) relationships and whether social media was used late night/early morning, respectively (Lauckner et al., 2018, Shensa et al., 2018 & Barman et al., 2018). Having close FTF relationships with social media contacts had a significantly negative association with depression, while no FTF relationships with SM contacts and excessive SM use had significantly positive associations with depression (Shensa et al., 2018). Impression management, disclosure amount, disclosure honesty, disclosure intent, use of Facebook privacy settings and enacted social support on Facebook did not have significant evidence of an association with depression (Jang et al., 2016, Zhang, 2017 & Kokkinos & Saripanidis, 2017) (see table 5).

Other factors measured on social media

Other factors measured and which showed a positive significant association with depression included: being neurotic, loneliness, having negative social media experiences, academic/environmental/interpersonal stressors and appearance-related social media consciousness (Kokkinos & Saripanidis, 2017, Zhang, 2017 & Choukas-Bradley et al., 2018). A

majority (64%) of studies also found other factors that had a significant negative association with depression (i.e. body esteem, life satisfaction, self-esteem, positive suicidal idealization, general belongingness, age, extraversion, agreeableness, conscientiousness, sex, race and perceived social support) (Choukas-Bradley et al., 2018, Rad & Ahmadi, 2018, Jang et al., 2016, Jasso-Medrano & Lopez-Rosales, Kircaburn et al., 2018, Kokkinos & Saripanidis, Shensa et al., 2018, Tang et al., 2017 and Zhang, 2017). The most common was self-esteem, which was measured in 21% of articles (Jang et al., 2016, Kokkinos & Saripanidis, 2017 & Kircaburn et al., 2018). Self-esteem was measured with zero-order, bivariate or Pearson's correlations, 14% correlated self-esteem with depression with -0.41 being the highest correlation and -0.26 the lowest and 7% of articles correlated self-esteem with mental health (0.44) (Jang et al., 2016) (see table 5). Other factors measured using various correlation measures included perceived social support, neuroticism, loneliness, academic stressors, environmental stressors, interpersonal stressors, satisfaction with life, extraversion, conscientiousness, agreeableness, Facebook network size, appearance related social media consciousness, body esteem, suicidal ideation, general belongingness, sex and age (Jang et al., 2016, Kokkinos & Saripanidis, 2017, Zhang, 2017, Choukas-Bradley et al., 2018, Jasso-Medrano & Lopez-Rosales, 2018 & Kircaburn et al., 2018). Neuroticism had the highest correlations. When correlated with depression, neuroticism had a correlation value of 0.58 and when correlated with well-being had a correlation value of -0.68 (Kokkinos & Saripanidis, 2017 & Turel et al., 2018). Loneliness, suicidal ideation and academic stressors also had relatively high correlations with depression with correlation values 0.52, 0.48 and 0.42, respectively (Kokkinos & Saripanidis, 2017, Jasso-Medrano & Lopez-Rosales, 2018 & Zhang, 2017). Other factors studied which showed significantly negative associations with

depression included: body esteem, general belongingness, and satisfaction with life (Choukas-Bradley et al., 2018, Kircaburn et al., 2018 & Zhang, 2017). Indiscrete Facebook content, knowledge of privacy settings, number of Facebook friends and Facebook network size did not have significant evidence of an association with depression (Kokkinos & Saripanidis, 2017 & Zhang, 2017). The number of social network sites used was measured for depression using mean rank and showed no significance (Barman et al., 2018). The randomized clinical trial included in this review used an app to control social media use with the intervention group for two weeks. The study showed the app significantly reduced time spent on social media, anxiety, depression, sleep quality and life satisfaction in the intervention group (Rad & Ahmadi, 2018).

DISCUSSION

The goal of this scoping review was to study the association between social media use and depression in college students. This study specifically focused on SM use related to time spent on social media, social media addiction and social media behaviors; however, individual characteristics were extracted from final articles as well. There were conflicting findings regarding time spent on social media and depression and studies showing a significant relationship between time spent on social media and depression showed a smaller correlation when comparing depression correlations with other measured factors. According to Choukas-Bradley et al. (2018), when controlling for time, appearance-related social media consciousness (ARSM) was significantly associated with depressive symptoms in college women. The correlation between ARSM was higher than time spent on social media which suggests women's SM experience can be more predictive of depression than time spent on social media (Choukas-

Bradley et al., 2018). Time spent on social media might also be a result of individual experiences. According to Kircaburn et al. (2018), students who feel socially isolated may spend more time on social media to fulfill their need of socializing and feeling connected. The mixed findings and smaller correlations could mean that time spent on social media is not directly correlated with depression; however, it is important to note that measurements in studies measuring time were all different and future studies utilizing a standardized measure could be useful.

When looking at studies comparing the association between social media addiction and depression, it was observed that some countries have a higher risk of depression when addicted to social media. Addiction rates found in *Online Social Networking Addiction Among College Students in Singapore: Comorbidity with Behavioral Addiction and Affective Disorder* was shown to be relatively high (30%), falling in the range of 24-35% of Asian students, found in previous studies. Chinese students spend more time on social networking sites than US students (about 10 hours a week vs. 6.4 hours a week) and the long hours can result in getting addicted. Directionality cannot be assumed due to the cross-sectional nature of the study and being addicted could lead to more time on social media (Tang et al., 2017). Tang et al. (2017) suggests SNS addition and depression could be due to FOMO, demands of relationship maintenance, constant social comparison and frequent violation of privacy. In a three-way model observing social media addiction, neuroticism and well-being, it was observed that high neuroticism magnified negative associations between SNS addiction symptoms and well-being in females; however, addiction symptoms were the same in men, despite levels of neuroticism (Turel et al.,

2018). Tang et al. (2017) suggests males tend to be addicted to online games where as females tend to be addicted to social interaction, which could be due to the male need for power and control or to explore sexual fantasies and for the female need to share feelings and emotions.

Close relationships with Facebook contacts, social comparison, problematic social media use, being neurotic, extraversion, agreeableness, cyberbullying perpetration, body surveillance and excessive social media use were significantly associated with depression. When looking at other social media behaviors, individual differences appeared to have a higher correlation with depression. In studies focusing on Facebook, a person having high self-esteem was shown to have a lower risk of depression. According to Jang et al. (2016), those with low self-esteem were more likely to compare on Facebook, than those with higher self-esteem, and were more likely to feel hurt when comparing themselves to others; individuals who managed their impression on Facebook were also more likely to engage in social comparison (Jang et al., 2016). Body comparison and surveillance were more common in individuals more conscious of their appearance on social media (Choukas-Bradley et al., 2018). No face-to-face (FTF) relationships with social media contacts significantly increased odds of depressive symptoms, while close FTF relationships with SM contacts significantly decreased odds of depressive symptoms. On social media, users can present a modified version of themselves and might not provide authentic relationships; however, using SM to develop online relationships can supplement established relationships (Shensa et al., 2018). Lack of genuine relationships can lead to loneliness which was highly correlated with depression (Kokkinos & Saripanidis 2017). Self-disclosure on Facebook in Hong Kong students could have been due to stressful events and to gain social

support; however, posts were modified to maintain their image. Those who practiced self-disclosure experienced higher life satisfaction, which aligns with findings that talking about your problems is healthy; however, honest disclosures were associated with lower life satisfaction (Zhang, 2017). This agrees with findings of posting indiscreet Facebook content being positively associated with Facebook victimization (Kokkinos & Saripanidis, 2017). Kokkinos & Saripanidis (2017) suggests posting indiscrete content can make an individual easier to bully and depression is a predictor of Facebook victimization. Cyberbullying victimization has been found to be a strong predictor of cyberbullying perpetration via anger and cyberbullying perpetration's association with depression has been found to be fully mediated by problematic social media use (Kircaburan, 2018). Higher problematic social media use was indirectly associated with feeling less social connectedness, belongingness, and self-esteem via depression (Kircaburan, 2018).

Most of the articles included in this scoping review were cross-sectional and were unable to determine the directionality the association between the use of social media and depression. It is possible that depression leads to increased time on social media, social media addiction and social media behaviors such as problematic social media use; however, longitudinal studies are needed to provide evidence of causality. According to Lauckner et al. (2018), students with depressive symptoms could be receptive to technological based interventions. Designed mobile apps as reality therapy have been shown to reduce social networking addiction and time spent on social media and depression. The reduced depression rate found in the intervention group provides possibility that depression related to social media use can be regulated through apps; however, this RCT was assessed after 2 weeks of use and a longer study is important to confirm

findings (Rad & Ahmadi, 2018). Studies used a broad range of measurements to assess SM use and depression, making comparisons difficult across studies; thus, it would be helpful to be consistent in social media use and depression measurements to perform systematic reviews/meta-analyses to determine association. Articles used self-reported measures which could have led to under-reporting. This could be remedied with diagnostic tools or participation of mental health professionals (Tang & Koh, 2017). Convenience sampling and lack of diversity could have also limited generalizability (Lauckner et al., 2018).

Potential Strengths and Limitations

There are currently no scoping or systematic reviews focused on social media usage and depression in college students and these findings could contribute to ideas for future research on an issue that currently has a high prevalence. By not restricting to the US population, this scoping review can observe similarities and differences between nations that have been studied. A scoping review also reduces potential biases between studies; however, although only one article was inaccessible, lack of access to articles could have introduced some bias. Limitations present in this review include: 1) I was the only reviewer and could have missed articles through the scanning process, 2) this was an exploratory study and including multiple countries may confuse results and 3) limiting my articles to English-language only articles could eliminate studies in other languages that would provide additional information.

CONCLUSION

This review reiterated the need for longitudinal studies to access directionality and the need to standardize measures used to measure social media, depression in college students. Articles consistently showed higher correlations (>.40) between loneliness, neuroticism, self-esteem, SM addiction, SM comparison and depression in college students, calling for future studies to continue to focus on the relationship between individual characteristics, SM addiction, SM comparison and depression. Further studies could also perform RCTs, utilizing treatment periods longer than 2-weeks.

Figure 1: Flowchart of scoping review process of social media and depression in college students

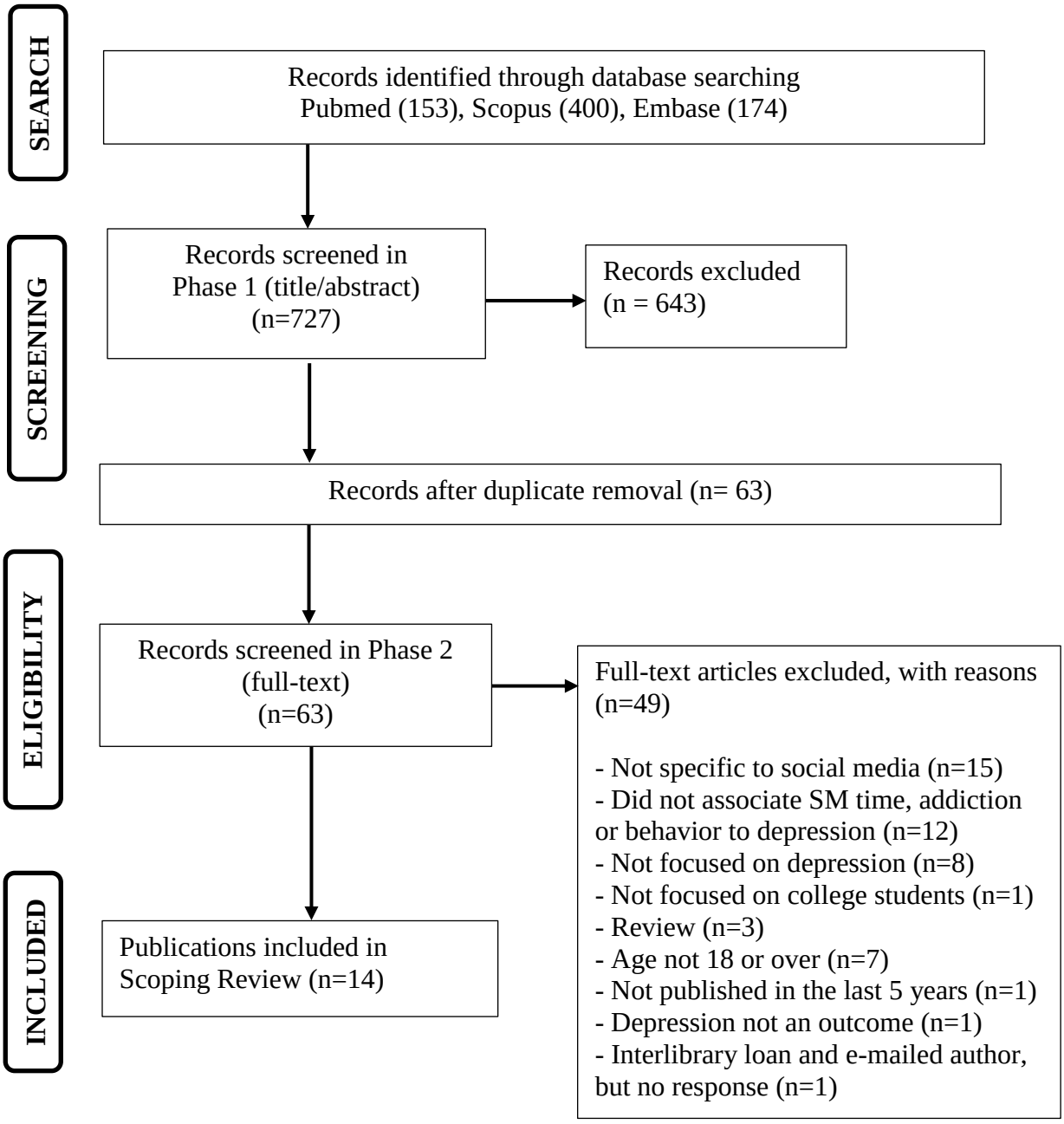

Table 3 Characteristics of Articles Included in this Scoping Review

	Author, Year	Population of study	Sample size and selection	Age	Study design	Type of social media included in study
1	Jang et al., 2016	Communication students from a large private university in Seoul, South Korea	313 – volunteered	Average age 21.17 years SD: 1.95	Cross-sectional	Facebook
2	Kokkinos & Saripanidis, 2017	University students from Greece with a Facebook account	240 - availability and snowball sampling	18-51 years	Cross-sectional	Facebook
3	Tang et al., 2017	Undergraduate students from China, Singapore and US	3267 – convenience sample	18-25 years	Cross-sectional	Social Networking Sites (SNS)
4	Tang & Koh, 2017	College students from a University in Singapore	1110 – convenience sample	18-25 years	Cross-sectional	Social Networking Sites (SNS)
5	Zhang, 2017	Students from a university in Hong Kong	560 – random sampling	18-25 years	Cross-sectional	Facebook
6	Barman, 2018	Undergraduate students from a medical college in Kolkata, West Bengal	200 – random sampling	21.6 +/- 1.8 years	Cross-sectional	Social Networking Sites (SNS)
7	Choukas-Bradley, 2018	College women enrolled in psychology courses at a large university in the southeastern United States	339 – enrolled students	18-19 years	Cross-sectional	Facebook, Instagram, Snapchat, Twitter, etc.
8	Jasso-Medrano & Lopez-Rosales, 2018	University students from Mexico	374 - recruited	18-24 years	Cross-sectional	Whats App and Facebook

9	Kircaburn et al., 2018	University students from a state university in the US	760 - volunteer	18-40 years	Cross-sectional	Social Networking Sites (SNS)
10	Lauckner et al., 2018	University students at two universities in Southeastern US	255- convenience sample	18 or older	Cross-sectional	Facebook, Snapchat, Instagram, Twitter, Yik Yak and Tumbler
11	Rad & Ahmadi, 2018	Students from the University of Technology in Urmia, Iran	200 – random sampling	18-28 years	Randomized Controlled Trial where intervention group used mobile app to control social network addiction, depression, anxiety, sleep quality, cognitive failure and life satisfaction	SNS, most popular were Telegram, Instagram, and Twitter
12	Shensa et al., 2018	Students from Mid-Atlantic US state university	1124 – convenience sample	At least 18 years old	Cross-sectional	Social media (SM)
13	Tang et al., 2018	College students from United States, Singapore, HK/Macau, China (Beijing), South Korea (Seoul), Taiwan (Taichung) and Japan (Kyoto)	8067 – convenience sample	18-30 years	Cross-sectional	Social Networking Sites (SNS)
14	Turel et al., 2018	Israeli college students who use Facebook	215 – convenience sample	>=18 years	Cross-sectional	Facebook

Table 4 Measurements used in Included Articles to Access Social Media Use and Depression

	Author, Year	Measurement used to assess social media use	Measurement used to assess depression
1	Jang et al., 2016	Facebook use was measured using 3 questions: 1) how often do you post on Facebook, 2) how often do you look at other people's posts and how often do you use Facebook. Social comparison on Facebook and Impression Management were also measured	Mental health was measured with 5-item RAND Mental Health Inventory
2	Kokkinos & Saripanidis, 2017	Time spent on social media (how much time on a 6-point frequency scale) and Facebook Victimization using a self-report questionnaire	9-item patient health questionnaire (PHQ-9)
3	Tang et al., 2017	Social Network Addiction – Modified 6-item Bergen Facebook Addiction Scale (BFAS)	9-item Depression Scale (adopted from Diagnostic and Statistical Manual of Mental Disorders (DSM-5))
4	Tang & Koh, 2017	Modified 6-item Bergen Facebook Addiction Scale (BFAS)	Diagnostic and Statistical Manual of Mental Disorders (DSM-5)
5	Zhang, 2017	Facebook use: asked if they had a Facebook profile, how many minutes per day on average was spent on Facebook in the past week and how many Facebook friends they had. Enacted social support and self-disclosure were also measured	Depression was measured with the Patient Health Questionnaire. (PHQ-9)
6	Barman, 2018	Structured questionnaire for assessment of the use of SNS	Becks depression inventory (BDI)
7	Choukas-Bradley, 2018	Time spent on social media – free response format of average number of hours and minutes participants use social media on a typical day. Body comparison and body surveillance were also measured	13-item short mood and feelings questionnaire
8	Jasso-Medrano & Lopez-Rosales, 2018	Cuestionario de Addiccion a Redes Sociales (ARS) (Social Network Addiction Questionnaire)	Center for Epidemiologic Studies Depression Scale (CES-D)

9	Kircaburn et al., 2018	Social Media Use Questionnaire (SMUQ) and Cyberbullying Offending Scale (CBOS)	Short Depression-Happiness Scale (SDHS)
10	Lauckner et al., 2018	Social network intensity	Patient health questionnaire-9 (PHQ-9)
11	Rad & Ahmadi, 2018	Social media: seven-dimension online social networking addiction scale	Becks depression inventory (BDI)
12	Shensa et al., 2018	Real-life closeness of social media contacts – 1) no face-to-face (FTF) relationship; 2) a distant FTF relationship and 3) a close FTF relationship	4-item patient reported outcomes measurement information system (PROMIS)
13	Tang et al., 2018	Modified six-item Bergen Facebook Addiction Scale (BFAS)	9-item depression scale adopted from DMS-5
14	Turel et al., 2018	Hebrew translation of the 6-item Bergen Facebook Addiction Scale	World Health Organization (WHO) five item Wellbeing Index (WHO-5)

Table 5 Statistics of Social Media Use and Depression/Mental Health/Well-being in College Students from Scoping Review

	Author, Year	Social Media Measurement	Depression Measurement	Association Measurement	Statistic	Positively associated with depression
Association Between Time on Social Media and Depression						
Hours spent on SM						
1	Kokkinos & Saripanidis, 2017	6-point scale (≤10 minutes (min.), 10-30 min., 30-60 min., 1-2 hours (hrs.), 2-3 hrs. and ≥ 3 hrs.)	PHQ-9	Spearman's Rho	0.15*	Yes
2	Zhang, 2017	6-point scale (≤ 10 min., 10-30 min., 31-60 min., 1-2 hrs., 2-3 hrs. and ≥ 3 hrs.)	PHQ-9	Zero-order correlation	0.02	Yes
3	Barman, 2018	Questionnaire	BDI	Mean Rank (<=4 vs >4 hours)	79.91 vs. 103.85*	Yes
4	Choukas-Bradley, 2018	Free response	13-item Short Mood and Feelings Questionnaire	Bivariate Correlation	0.17**	Yes
5	Jasso-Medrano & Lopez-Rosales, 2018	Social Network Addiction Questionnaire	CES-D	Spearman's Rho	-0.07	No
6	Rad & Ahmadi, 2018	Seven-dimension online social networking addiction scale	BDI	Mean Rank (intervention - before vs. after treatment)	39.00 vs. 29.00** (time) 48.10 vs. 50.96** (depression)	Yes
				Mean Rank (control - before vs. after treatment)	37.45 vs. 36.54 (time) 48.10 vs. 50.96 (depression)	No

Table 5 Continued

Daily Use Frequency						
1	Barman, 2018	Questionnaire	BDI	Mean rank (<4 vs. >=4 times	77.52 vs. 104.24*	Yes
Association Between Time on Social Media and Wellbeing						
Hours spent on SM						
1	Turel et al., 2018	BFAS	WHO-5	Correlation Matrix	-0.19	Yes
Daily Use Frequency						
1	Turel et al., 2018	BFAS	WHO-5	Correlation Matrix	-0.07	Yes
Association Between Social Media Addiction and Depression						
1	Tang et al., 2017	BFAS	Modified DSM-5	Multivariate Logistic Regression	0.13*	Yes
				Odds Ratio		
				China vs. US	1.398 (1.008-1.932)	Yes
				Singapore vs. US	1.097 (0.778-1.547)	Yes
2	Tang & Koh, 2017	BFAS	DSM-5	Comorbidity - Total	SN addition - 29.5% Depression - 21.0%	Yes
				Comorbidity - Male	SN addition - 22.1% Depression - 13.9%	Yes
				Comorbidity - Female	SN addition - 33.9% Depression - 25.1%	Yes
3	Barman, 2018	Questionnaire	BDI	Mean rank (stated ability to spend a day without accessing SNSs-yes vs. no)	92.22 vs. 126.71**	Yes

Table 5 Continued

4	Jasso-Medrano & Lopez-Rosales, 2018	Social Network Addiction Questionnaire	CES-D	Spearman's Rho coefficient	0.25**	Yes
5	Tang et al., 2018	BFAS	Modified DSM-5	Risk Ratio		
				Singapore vs. US	1.02 (0.92 - 1.12)	
				HK/Macau vs. US	1.28 (1.19-1.39)	
				China vs. US	1.06 (0.97 - 1.16)	
				South Korea vs. US	1.02 (0.93-1.13)	
				Taiwan vs. US	0.97 (0.89-1.07)	
				Japan vs. US	1.12 (1.02-1.22)	
Association Between Social Media Addiction and Wellbeing						
1	Turel et al., 2018	BFAS	WHO-5	Correlation Matrix	-0.57**	Yes
Association Between Social Media Behaviors and Mental Health						
Social Comparison						
1	Jang et al., 2016	Iowa-Netherlands Comparison Orientation Measure	RAND Mental Health Inventory	Zero-order correlation	-0.15**	Yes
Facebook Use						
2	Jang et al., 2016	Free response	RAND Mental Health Inventory	Zero-order correlation	-0.05	Yes
Impression Management						
3	Jang et al., 2016	Self-promotion and ingratiation among the impression management scale	RAND Mental Health Inventory	Zero-order correlation	0.01	No
Association Between Social Media Behaviors and Depression						
Social Network Intensity						
1	Lauckner et al., 2018	5-point scale (strongly disagree to strongly agree)	PHQ-9	Regression	-0.1	No

Table 5 Continued

Face-to-Face Relationship with FB Contacts						
2	Shensa et al., 2018	Proportion of SM friends (on platform most used) with whom they have:	PROMIS	Odds Ratio - increased odds of moderate/severe depressive symptoms for every 10% increase in independent variable		
		No FTF Relationship			1.09 (1.05-1.13)	Yes
		Distant FTF Relationship			1.01 (0.96-1.05)	Yes
		Close FTF Relationship			0.93 (0.88-0.97)	No
Enacted Social Support on FB						
3	Zhang, 2017	5-item Scale (never to all the time)	PHQ-9	Zero-order correlation	-0.03	No
Self-Disclosure						
4	Kokkinos & Saripanidis, 2017	10-item Self-Disclosure Index	PHQ-9	Pearson correlation	0.14*	Yes
5	Zhang, 2017	General Disclosiveness Scale	PHQ-9	Zero-order correlation		
		Honesty			-0.07	No
		Intent			0.04	Yes
		Amount/Intimacy			0.02	Yes
Indiscreet Facebook Content						
6	Kokkinos & Saripanidis, 2017	30-item Questionnaire	PHQ-9	Pearson correlation	0.16	Yes
Body Surveillance						
7	Choukas-Bradley, 2018	Objectified Body Consciousness Scale	13-item Short Mood and Feelings Questionnaire	Bivariate Correlation	0.25**	Yes

Table 5 Continued

Body Comparison						
8	Choukas-Bradley, 2018	6-item Body Comparison Orientation Scale	13-item Short Mood and Feelings Questionnaire	Bivariate Correlation	0.24**	Yes
Problematic Social Media Use						
9	Kircaburn et al., 2018	SMUQ	SDHS	Pearson correlation	0.37**	Yes
Facebook Victimization						
10	Kokkinos & Saripanidis, 2017	Self-report Questionnaire	PHQ-9	Pearson correlation	0.29**	Yes
Cyberbullying Perpetration						
11	Kircaburn et al., 2018	Cyberbullying offending scale	SDHS	Bivariate Correlation	0.19**	Yes
Used late night/early morning						
12	Barman et al., 2018	Questionnaire	BDI	Mean rank (yes vs. no)	112.45 vs 85.90**	Yes
Facebook Network Size						
13	Zhang, 2017	6-point scale (≤ 10, 11-100, 101-200, 201-30, 201-400 and > than 400)	PHQ-9	Zero-order correlation	0	--
Use of FB Privacy Setting						
14	Kokkinos & Saripanidis, 2017	yes/no question	PHQ-9	Spearman's rho	0.09	Yes
Correlation Between Individual Factors and Mental Health						
Self-Esteem						
1	Jang et al., 2016	Rosenberg's Self-Esteem Scale	RAND Mental Health Inventory	Zero-order correlation	0.44**	Yes

Table 5 Continued

Correlation Between Individual Factors and Depression						
Self-Esteem						
2	Kokkinos & Saripanidis, 2017	Self-report Questionnaire	PHQ-9	Pearson correlation	-0.41**	Yes
Neuroticism						
3	Kokkinos & Saripanidis, 2017	Self-report Questionnaire	PHQ-9	Pearson correlation	0.58**	Yes
Loneliness						
4	Kokkinos & Saripanidis, 2017	20-item UCLA Loneliness Scale Version 3	PHQ-9	Pearson correlation	0.52**	Yes
Academic Stressors						
5	Zhang, 2017	5-point scale (did not occur to occurred and extremely stressful)	PHQ-9	Zero-order correlation	0.42**	Yes
Suicidal Ideation						
6	Jasso-Medrano & Lopez-Rosales, 2018	Positive and Negative Suicidal Ideation Inventory	CES-D	Spearman's rho	0.48**	Yes
Correlation Between Individual Factors and Wellbeing						
Neuroticism						
1	Turel et al., 2018	Big five inventory	WHO-5	Correlation Matrix	-0.68**	Yes

*p<0.05, **p<0.01

Table 6 Association between Time on SM, SM Addiction and SM Behaviors and Depression and Significance

Social Media Factors Studied	Association with depression	Significant
Time on Social Media		
Amount in hours	Mixed	Mixed
Daily frequency	Positive	Mixed
Social Media Addiction	Positive	Yes
Social Media Behavior		
Social Comparison	Positive	Yes
Facebook Use	Positive	No
Impression Management	Negative	No
Social Network Intensity	Positive	No
Close face-to-face relationship with FB Contacts	Negative	Yes
Distant face-to-face relationship with FB Contacts	Positive	No
Negative face-to-face relationship with FB Contacts	Positive	Yes
Enacted social support on FB	Negative	No
Self-disclosure on FB	Mixed	Mixed
Indiscreet FB content	Positive	No
Body surveillance	Positive	Yes
Body comparison	Positive	Yes
Problematic social media use	Positive	Yes
Facebook Victimization	Positive	Yes
Cyberbullying perpetration	Positive	Yes
Used late-night/early morning	Positive	Yes
Use of privacy settings	Positive	No

REFERENCES

Baker, D. A., & Algorta, G. P. (2016). The relationship between online social networking and depression: A systematic review of quantitative studies. *Cyberpsychology, Behavior and Social Networking, 19*(11), 638-648. doi:10.1089/cyber.2016.0206

Barman, L., Mukhopadhyay, D. K., & Bandyopadhyay, G. K. (2018). Use of social networking site and mental disorders among medical students in kolkata, west bengal. *Indian Journal of Psychiatry, 60*(3), 340-345. doi:10.4103/psychiatry.IndianJPsychiatry_210_18

Bottino, S. M., Bottino, C. M., Regina, C. G., Correia, A. V., & Ribeiro, W. S. (2015). Cyberbullying and adolescent mental health: Systematic review. *Cadernos De Saúde Pública, 31*(3), 463-475. doi:10.1590/0102-311x00036114

Brain Maturity Extends Well Beyond Teen Years. (2011, October 10). Retrieved March 28, 2019, from https://www.npr.org/templates/story/story.php?storyId=141164708

Choukas-Bradley, S., Nesi, J., Widman, L., & Higgins, M. K. (2018). Camera-ready: Young women's appearance-related social media consciousness. *Psychology of Popular Media Culture*, No Pagination Specified-No Pagination Specified. doi:10.1037/ppm0000196

Depression. (2018[a], February). Retrieved March 28, 2019, from https://www.nimh.nih.gov/health/topics/depression/index.shtml

Depression. (2018[b], March 22). Retrieved March 28, 2019, from http://www.who.int/en/news-room/fact-sheets/detail/depression

Depression and College Students. (n.d.). Retrieved from March 28, 2019, https://www.nimh.nih.gov/health/publications/depression-and-college-students/index.shtml

Depression in the U.S. Household Population, 2009-2012. (2014, December 03). Retrieved March 28, 2019, from https://www.cdc.gov/nchs/data/databriefs/db172.htm

Digest of Education Statistics, 2017. (n.d.). Retrieved March 28, 2019, from https://nces.ed.gov/programs/digest/d17/tables/dt17_303.40.asp

Dmytriw, A. A., Sorenson, T. J., Morris, J. M., Nicholson, P. J., Hilditch, C. A., Graffeo, C. S., et al. (2018). #Fake news: A systematic review of mechanical thrombectomy results among neurointerventional stroke surgeons on twitter. *Journal of Neurointerventional Surgery,* doi:neurintsurg-2018-014319

Escobar-Viera, C. G., Whitfield, D. L., Wessel, C. B., Shensa et al., A., Sidani, J. E., Brown, A. L., et al. (2018). For better or for worse? A systematic review of the evidence on social media use and depression among lesbian, gay, and bisexual minorities. *JMIR Mental Health, 5*(3), e10496. doi:10.2196/10496

Good mental health. (2017). Retrieved March 28, 2019, from https://www.healthdirect.gov.au/good-mental-health

Grant, M. J., & Booth, A. (2009). A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information & Libraries Journal, 26*(2), 91-108. doi:10.1111/j.1471-1842.2009.00848.x

Guedes, E., Sancassiani, F., Carta, M. G., Campos, C., Machado, S., King, A. L., & Nardi, A. E. (2016). Internet Addiction and Excessive Social Networks Use: What About Facebook? *Clinical Practice & Epidemiology in Mental Health, 12*(1), 43-48. doi:10.2174/1745017901612010043

Hamm, M. P., Newton, A. S., Chisholm, A., Shulhan, J., Milne, A., Sundar, P., et al. (2015). Prevalence and effect of cyberbullying on children and young people: A scoping review of social media studies. *JAMA Pediatrics, 169*(8), 770-777. doi:10.1001/jamapediatrics.2015.0944

Holland, G., & Tiggemann, M. (2016). A systematic review of the impact of the use of social networking sites on body image and disordered eating outcomes. *Body Image, 17*, 100-110. doi:10.1016/j.bodyim.2016.02.008

Hsu, M. S. H., Rouf, A., & Allman-Farinelli, M. (2018). Effectiveness and behavioral mechanisms of social media interventions for positive nutrition behaviors in adolescents: A systematic review. *The Journal of Adolescent Health : Official Publication of the Society for Adolescent Medicine*, doi:S1054-139X(18)30249-0

Jang, K., Park, N., & Song, H. (2016). *Social comparison on facebook: Its antecedents and psychological outcomes* doi:https://doi.org/10.1016/j.chb.2016.03.082

Jasso-Medrano & Lopez-Rosales, J. L., & López-Rosales, F. (2018). Measuring the relationship between social media use and addictive behavior and depression and suicide ideation among university students. *Computers in Human Behavior, 87*, 183-191. doi:10.1016/j.chb.2018.05.003

Kircaburn et al., K., Kokkinos & Saripanidis, C. M., Demetrovics, Z., Király, O., Griffiths, M. D., & Çolak, T. S. (2018). Problematic online behaviors among adolescents and emerging adults: Associations between cyberbullying perpetration, problematic social media use, and psychosocial factors. *International Journal of Mental Health and Addiction*, 1-18. doi:10.1007/s11469-018-9894-8

Klassen, K. M., Douglass, C. H., Brennan, L., Truby, H., & Lim, M. S. C. (2018). Social media use for nutrition outcomes in young adults: A mixed-methods systematic review. *The International Journal of Behavioral Nutrition and Physical Activity, 15*(1), 70. doi:10.1186/s12966-018-0696-y

Kokkinos & Saripanidis, C. M., & Saripanidis, I. (2017). A lifestyle exposure perspective of victimization through facebook among university students. do individual differences matter? *Computers in Human Behavior, 74*, 235-245. doi:10.1016/j.chb.2017.04.036

Kuss, D. J., & Griffiths, M. D. (2011). Online Social Networking and Addiction—A Review of the Psychological Literature. *International Journal of Environmental Research and Public Health, 8*(9), 3528-3552. doi:10.3390/ijerph8093528

Lauckner, C., Hill, M., & Ingram, L. A. (2018). An exploratory study of the relationship between social technology use and depression among college students. *Journal of College Student Psychotherapy*, doi:10.1080/87568225.2018.1508396

Lin, L. Y. (2016). Association between use of social networking media and depression in adolescents and young adults. *Depress Anxiety*, 323-331. doi:10.5353/th_b5805152

Lup, K., Trub, L., & Rosenthal, L. (2015). Instagram #Instasad?: Exploring Associations Among Instagram Use, Depressive Symptoms, Negative Social Comparison, and Strangers Followed. *Cyberpsychology, Behavior, and Social Networking, 18*(5), 247-252. doi:10.1089/cyber.2014.0560

Major Depression. (n.d.). Retrieved March 28, 2019, from https://www.nimh.nih.gov/health/statistics/major-depression.shtml

Mental and Emotional Well-being. (n.d.). Retrieved April 10, 2019, from https://www.surgeongeneral.gov/priorities/prevention/strategy/mental-and-emotional-well-being.html

Park, J., Lee, D. S., Shablack, H., Verduyn, P., Deldin, P., Ybarra, O., . . . Kross, E. (2016). When perceptions defy reality: The relationships between depression and actual and perceived Facebook social support. *Journal of Affective Disorders, 200,* 37-44. doi:10.1016/j.jad.2016.01.048

Rad, M.E., & Ahmadi, F. (2018). A new method to measure and decrease the online social networking addiction. *Asia-Pacific Psychiatry, 10*(4) doi:10.1111/appy.12330

Rosenthal, S. R., Buka, S. L., Marshall, B. D., Carey, K. B., & Clark, M. A. (2016). Negative Experiences on Facebook and Depressive Symptoms Among Young Adults. *Journal of Adolescent Health, 59*(5), 510-516. doi:10.1016/j.jadohealth.2016.06.023

Seabrook, E. M., Kern, M. L., & Rickard, N. S. (2016). Social networking sites, depression, and anxiety: A systematic review. *JMIR Mental Health, 3*(4), e50. doi:v3i4e50

Shensa et al., A., Sidani, J. E., Escobar-Viera, C. G., Chu, K., Bowman, N. D., Knight, J. M., & Primack, B. A. (2018). Real-life closeness of social media contacts and depressive symptoms among university students. *Journal of American College Health,* 1-8. doi:10.1080/07448481.2018.1440575

Smith, A., & Anderson, M. (2018, September 19). Social Media Use 2018: Demographics and Statistics. Retrieved March 28, 2019, from http://www.pewinternet.org/2018/03/01/social-media-use-in-2018/

Social Media. (2004). Retrieved March 28, 2019, from https://www.merriam-webster.com/dictionary/social media

Tang, C. S., Koh, Y. W., & Gan, Y. (2017). Addiction to internet use, online gaming, and online social networking among young adults in china, singapore, and the united states. *Asia-Pacific Journal of Public Health, 29*(8), 673-682. doi:10.1177/1010539517739558

Tang, C. S. & Koh, Y. Y. W. (2017). Online social networking addiction among college students in singapore: Comorbidity with behavioral addiction and affective disorder. *Asian Journal of Psychiatry, 25*, 175-178. doi:10.1016/j.ajp.2016.10.027

Tang, C. S. K., Wu, A. M. S., Yan, E. C. W., Ko, J. H. C., Kwon, J. H., Yogo, M., . . . Koh, Y. Y. W. (2018). Relative risks of internet-related addictions and mood disturbances among college students: A 7-country/region comparison. *Public Health, 165*, 16-25. doi:10.1016/j.puhe.2018.09.010

Tang, L., Bie, B., Park, S. E., & Zhi, D. (2018). Social media and outbreaks of emerging infectious diseases: A systematic review of literature. *American Journal of Infection Control, 46*(9), 962-972. doi:S0196-6553(18)30105-6

Training, C. (2017, August 31). Doing scoping reviews. Retrieved from March 28, 2019, https://www.youtube.com/watch?v=kdsHk84X5g0

Turel, O., Poppa, N. T., & Gil-Or, O. (2018). Neuroticism magnifies the detrimental association between social media addiction symptoms and wellbeing in women, but not in men: A three-way moderation model. *The Psychiatric Quarterly, 89*(3), 605-619. doi:10.1007/s11126-018-9563-x

Zhang, R. (2017). The stress-buffering effect of self-disclosure on facebook: An examination of stressful life events, social support, and mental health among college students. *Computers in Human Behavior, 75*, 527-537. doi:10.1016/j.chb.2017.05.043

Zimmerman, L., PhD. (n.d.). Do you fear missing out? Retrieved March 30, 2019, from https://www.apa.org/gradpsych/2016/01/missing-out