Social network use, social support, and mental health in adolescence: A systematic review

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Social network sites (SNS) are a preferred method of communication for many young people. Therefore, it is of increasing importance to examine the possible benefits and detriments of SNS use to adolescent mental health. One possible benefit to adolescents who engage with SNS is increased access to social support from peers, which may promote positive mental health. We aimed to systematically review the existing research that has examined relationships between SNS use, social support and mental health in adolescents. The protocol for this review was registered with PROSPERO. A systematic literature search was conducted using PRISMA guidelines for studies published between 2003 and 2021 to identify research that examined the relationships between SNS use, social support, and mental health in adolescents. Study quality was appraised using the Mixed Methods Appraisal Tool. Eleven articles met the criteria for inclusion in the current review. Findings show that adolescents use SNS to access social support when experiencing stressful life events and perception of support is important for enabling a positive impact on mental health. SNS offer marginalised groups a way to access social support that may be lacking in their offline life. There is a clear difference between males and females in how adolescents use SNS and how active and passive SNS use impacts mental health. Included studies are mostly cross-sectional in design, and investigations into the differences between male and female adolescents experiences of using SNS were limited. Despite the widespread publication of the adverse impact of SNS on adolescent well-being, access to social support is a clear benefit with positive impacts on adolescent mental health. However, the benefits of perceived social support appear to be context-specific.

Keywords: adolescence; mental health; online behaviour; social network sites; social support

Adolescent mental health and emotional well-being is a major public health concern due to the associated societal and economic burden it represents (Department of Health, 2015). Additionally, adolescents who experience mental health difficulties are at higher risk of poor mental health throughout their lives (Kessler et al., 2007). Social networking sites (SNS), such as Facebook, Twitter, Instagram and Snapchat, have become the primary method for communication among adolescents, with 92% reporting daily engagement, and 24% reporting that they go online 'almost constantly', facilitated by three-quarters of adolescents owning smart phones (Lenhart, 2015). As SNS use continues to be a preferred method of communication for many young people, it is of increasing importance to examine the possible benefits and detriments of SNS use to mental health in this group. In this review, we define SNS as a site where users have a personal profile that is publicly visible and content which is continuously updated and generated primarily by those who have profiles (status updates, photographs, videos, etc.) or by third parties (e.g., advertisements; Verduyn et al., 2017).

Research focused on the impacts of social media use and adolescent mental health has produced mixed results, indicating that the relationship is not unidimensional. There are many reported positive impacts of SNS use, including social connectedness, access to information and diverse perspectives, increased self-esteem, safe identity experimentation, enabling relationship maintenance and providing distractions from difficult situations (Best et al., 2014; Nesi et al., 2019; Verduyn et al., 2017). Alternatively, reported negative impacts of SNS use on adolescents include upward social comparison which elicits feelings of envy and resentment, exposure to harm, social isolation, cyberbullying and increased risk of depression (Best et al., 2014; Nesi et al., 2019; Verduyn et al., 2017). There is evidence that SNS use directly increases depressive symptoms in adolescents (Kelly et al., 2018). However, the size of the association was reduced when potential confounding factors such as experiences of online harassment, poor sleep quantity and quality, low self-esteem and distorted body image were accounted for (Kelly et al., 2018). This demonstrates the importance of understanding the nuances of the relationship between SNS use and adolescent mental health, and highlights that a dichotomous approach may be inappropriate when considering guidelines for safe online behaviours.

Social support is frequently reported as a positive outcome associated with SNS use, often also referred to as 'connectedness' or 'social capital'. Social support is defined as social interaction through which emotional concerns, instrumental aid and information are perceived, expressed or received (Tardy, 1985). It is a multidimensional construct that can have multiple sources (friends, family, partner) and multiple types (emotional, instrumental, informational, appraisal; Demaray & Malecki, 2002). Social support seeking has been identified as a coping strategy in dealing with various kinds of stressors for adolescents, reflecting a shift away from reliance on adults and towards self-reliance through seeking support from friends and peers (Zimmer-Gembeck & Skinner, 2011). This is important because perceived social support can play an important role in adjustment outcomes for adolescents, acting as a buffer against the detrimental effects of life stressors, and therefore promoting good mental health (Demaray & Malecki, 2002).

It is also possible, therefore, that perceptions of social support via SNS use may promote resilience to the potential harms of engagement with SNS for adolescents. This systematic review aims to review the existing literature that has examined the relationships between the use of SNS, social support and mental health in adolescents.

METHODS

Search strategy

PRISMA guidelines were followed to develop a protocol for the systematic review, which was pre-registered (Braithwaite et al., 2018). A systematic literature search was conducted for studies published between 2003 and 2021 to identify research that has examined the relationships between the use of social network sites, social support, and mental health in adolescents. Five databases were searched: PsycINFO, Cochrane Library, PubMed, Web of Science, and Scopus. The search terms used were 'support ' AND 'adolesc*' OR 'young adult' OR 'teen*' OR 'youth' OR 'junior' AND 'social network*' OR 'social media' OR 'facebook' OR 'twitter' OR 'Instagram' OR 'snapchat' OR 'online' AND 'well-being' OR 'mental*' OR 'dep*' OR 'anx*' OR 'distress '.

Inclusion

Following the initial database search, abstracts were screened for inclusion and potentially eligible articles were subjected to full-text screening. Articles were eligible for inclusion if they met the following criteria: peer-reviewed original studies (This included cohort studies, cross-sectional studies, prospective studies, longitudinal studies, and qualitative studies), have a measure of social network site use and a

measure for social support, and an outcome of symptoms of psychological distress; defined as a state of emotional suffering, such as anxiety and depression. The sample was required to be aged between 11–17 in any setting. We included studies of adolescents aged 11 or above in the review, as 11 is the earliest starting age that children would start high school, and their network of friends would expand. Reviews, non-peered reviewed studies, discussion papers, and editorials were not eligible for inclusion.

Data extraction

Study characteristics were extracted, including study design and location. Sample characteristics were extracted (sex, age, sample size, ethnicity), and the sampling strategy was used. Measures of psychological distress, SNS use, and social support were recorded, as well as any other measures used or concepts explored. How the data were analysed, the findings and the strengths and limitations of the studies were also recorded. Data were initially extracted by SF and EP separately. Any disagreements were discussed between SF and EP, using the protocol to reach a consensus on inclusion or exclusion.

Quality assessment

Study quality was appraised using the Mixed Methods Appraisal Tool (MMAT; Nha Hong et al., 2018). The MMAT consists of two screening questions and a further five questions suitable to the study design. An answer of 'Yes, 'No', or 'Can't tell' is noted for each question, and a percentage score is attributed to the study to denote the quality; the higher the percentage, the greater the quality. SF and EP appraised each study separately, and there was a 100% agreement between the authors. The MMAT score for each study can be found in Table 1.

Author(s)	Year	Sample												Findings	MMAT Score
		Gender										Age		Ethnicity	
		(n)	Male		Female		Trans-masculine		Trans-feminine		Non-binary		Range	Mean *SD*		
			n	%	n	%	n	%	n	%	n	%				
Frisson & Eggermont	2015	910	437.71	48.1	472.29	51.9	–	–	–	–	–	–	Not reported	*M* =15.44 *SD* = 1.71	96.% from Belgium, 1.8% from Europe, 2.1% from non-European country	Daily stress positively predicted adolescents seeking of social support through Facebook. When social support was sought through Facebook and subsequently perceived, social support seeking through Facebook decreased adolescents depressed mood. However, when social support was sought and not perceived, social support seeking through Facebook increased adolescent depressed mood.	80%
Frisson	2016	910	437.71	48.1	472.29	51.9	–	–	–	–	–	–	Not	*M* =15.44	96.% from Belgium, 1.8%	Passive Facebook use significantly	80%

& Eggermont		reported	*SD* = 1.71	from Europe, 2.1% from non-European country	positively predicted depressed mood. Active private Facebook use was not a significant predictor of depressed mood. Active public and private Facebook use positively predict perceptions of online social support. When adolescents actively use Facebook and subsequently perceive social support it decreases adolescent depressed mood. Girls who use Facebook actively either publicly or privately and perceive social support benefit from actively using Facebook. Perceived online social support negatively predicted girls depressed mood. There are no significant differences between boys and girls regarding

															passive Facebook use and perceived online social support.	
Leung	2007	717	349.89	48.8	367.11	51.2	–	–	–	–	–	–	Range 8–18	*M* = 12.75 *SD* = 2.01	Not reported	Motives for internet use in relation to social compensation and mood management were significantly linked to stress experienced by participants. Regression results show that SNS was the most popular internet activity for participants to help reduce stress.	80%
Wang et al.	2017	365	175.2	48	189.8	52	–	–	–	–	–	–	Range 14–18	*M* = 15.96 *SD* = 0.69	Not reported	Adolescents presenting authentically on SNS who perceive social support, will have a reduced tendency to ruminate, thereby reducing depression.	80%
Valkenburg, Peter & Schouten	2006	881	396.45	45	484.55	55	–	–	–	–	–	–	Range 10–19	*M* = 14.8 *SD* = 2.7	Not reported	Adolescent self-esteem was affected by the tone of the feedback they received on their SNS profiles. Positive feedback enhanced	80%

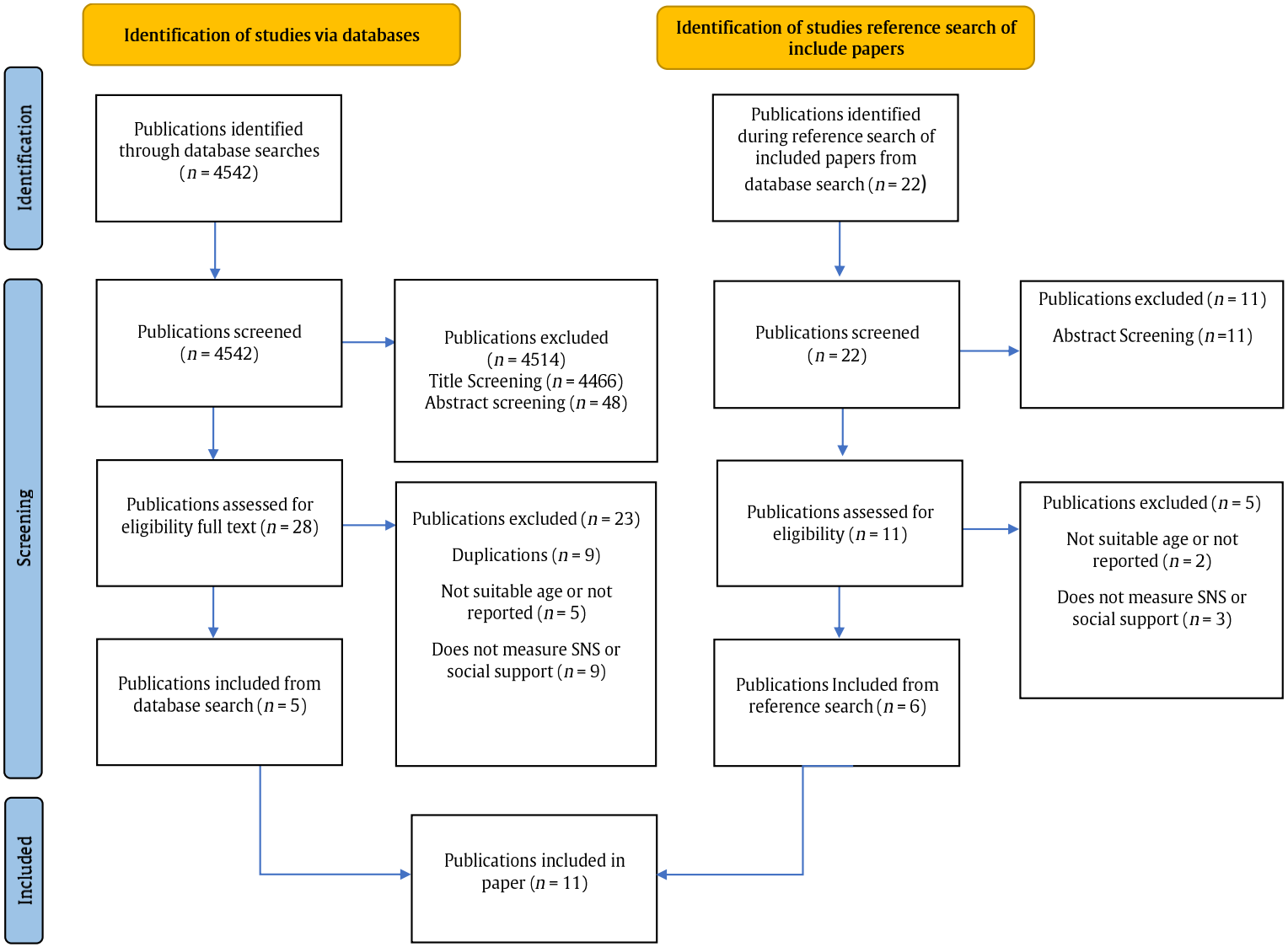
															adolescent self-esteem. The number of relationships did not affect self-esteem.	
Subrahmanyam & Lin	2007	156	78	50	78	50	–	–	–	–	–	–	Range 15–18.4	*M* = 16.5 *SD* = Not reported	40.4% White, 35.9% Asian, 15.4% Latino/Hispanic, 1.9% African American, 6.4% Other	The total amount of time online or using emails was not related to loneliness and perceived support from parents and close friends.	80%
Donichi & Moore	2004	336	151.64	34	294.36	66	–	–	–	–	–	–	Range 15–21	For 110 participants (adolescent group) *M* = 16.16 *SD* = 0.77	Not reported	Online friendships were associated with better well-being for girls, the opposite was true for boys. Higher numbers of regular online friendships amongst boys were related to lower self-esteem and greater loneliness. The number of offline friendships and their perceived importance positively predicted well-being for both boys and girls, while online friendship number and importance negatively	100%

															predicted well-being for boys only. Girls, around one-third of their time online engaged personal communication activities compared with boys who spend one quarter of their time doing this.	
Valkenburg et al	2007	1210	568.7	47	641.3	53	–	–	–	–	–	–	Range 10–17	Not Reported	Not reported	Most participants indicated that they used Instant Messaging (IM) to communicate with existing friends. Time spent using IM was positively related to the time spent with existing friends. The quality of friendships positively predicted well-being and acted as a first mediator between time spent with IM and well-being. Time spent with friends mediated the effect of time spent with IM on the quality of friendships.	80%

Selkie et al	2020	25	–	–	–	–	13	52	11	44	1	4	Range 15–18	Not Reported	20 identified as White, non-Hispanic; 1 as African American; 2 as American Indian; and2 as Asian	Participants described social media as a place where they could find emotional support. Participants described feeling validated by transgender-related social media content, particularly when the person posting the content was a public figure. Most participants commented on the ability to get information from other transgender people about gender affirming therapy as a helpful aspect of social media. All participants talked about seeing hurtful comments or content relating to transgender people.	100%
Best et al	2015	527 (Survey), 56 (Focus group)	583	100	–	–	–	–	–	–	–	–	Range 14–15	Not Reported	Not reported	Participants reported chatting with friends online more than chatting with strangers. Some stated they felt SNS strengthened their relationships	100%

															with others. There is a statistically significant positive relationship between the number of online friends and Warwick-Edinburgh mental wellbeing scale scores.	
Tseng et al	2015	391	177.01	45.25	213.99	54.75	–	–	–	–	–	–	Range 13–18	Not Reported	Not reported	Communicating online is a risk factor for Self-injurious Thoughts and Behaviours (SITB) in boys but not in girls. Support from virtual social communities can have both positive and negative effects on adolescent SITB, with different effects by gender. Boys with less depressive symptoms may log on to social networking sites more frequently than those with more depressive symptoms. Findings indicate that the effect online support may depend on what kinds of	80%

peers adolescents
contact.


Identification of studies via databases
Identification of studies reference search of include papers
Identification
Screening
Included
Publications identified through database searches (n = 4542)
Publications identified during reference search of included papers from database search (n = 22)
Publications screened (n = 4542)
Publications excluded (n = 4514)
Title Screening (n = 4466)
Abstract screening (n = 48)
Publications screened (n = 22)
Publications excluded (n = 11)
Abstract Screening (n =11)
Publications assessed for eligibility full text (n = 28)
Publications excluded (n = 23)
Duplications (n = 9)
Not suitable age or not reported (n = 5)
Does not measure SNS or social support (n = 9)
Publications assessed for eligibility (n = 11)
Publications excluded (n = 5)
Not suitable age or not reported (n = 2)
Does not measure SNS or social support (n = 3)
Publications included from database search (n = 5)
Publications Included from reference search (n = 6)
Publications included in paper (n = 11)

RESULTS

The initial database search identified 4,542 articles for screening, and 4514 were excluded following title and abstract screening (summarised in Figure 1). Of the remaining 28 articles, 23 were excluded (9 = duplicates, 5 = not the correct age group, 9 = did not report a measure of SNS or social support), resulting in five articles to be included. The reference lists of the 28 articles that remained after the title and abstract screening were also screened, and 22 additional articles were identified. Of these 22, 11 were excluded following abstract screening, and five were excluded following full-text screening (2 = not the correct age group, 3 = did not report a measure of SNS or social support), leaving 6 for including the review. Thus, a total of 11 articles met the criteria for inclusion in the current review (Best et al., 2015; Donchi & Moore, 2004; Frison & Eggermont, 2015, 2016; Leung, 2007; Selkie et al., 2020; Subrahmanyam & Lin, 2006; Tseng & Yang, 2015; Valkenburg et al., 2006; Valkenburg & Peter, 2007; Wang et al., 2017). A summary of the sample characteristics and main findings are displayed in Table 1.

Characteristics of included studies

Studies were located in Belgium (Frison & Eggermont, 2015, 2016), Hong Kong (Leung, 2007), China (Wang et al., 2017), the Netherlands (Valkenburg et al., 2006; Valkenburg & Peter, 2007; Wang et al., 2017), US (Selkie et al., 2020; Subrahmanyam & Lin, 2006), Australia (Donchi & Moore, 2004), Northern Ireland (Best et al., 2015), and Taiwan (Tseng & Yang, 2015).

Ten of the included studies used surveys in a cross-sectional design (Best et al., 2015; Donchi & Moore, 2004; Frison & Eggermont, 2015, 2016; Leung, 2007; Subrahmanyam & Lin, 2006; Tseng & Yang, 2015; Valkenburg et al., 2006; Valkenburg & Peter, 2007; Wang et al., 2017) and one used semi-structured interviews in a qualitative design (Selkie et al., 2020).

Sample sizes varied between 1210 (Valkenburg & Peter, 2007) and 25 (Selkie et al., 2020). A variety of scales were used to measure psychological distress, social support, and other concepts such as stress and self-esteem. These include, but are not limited to, the Centre for Epidemiological Studies Depression Scale (Radloff, 1991), The Roberts revision of the UCLA Loneliness scale (Roberts et al., 1993), the UCLA Loneliness Scale Version 3 (Russell, 1996), the Warwick-Edinburgh mental well-being scale (Clarke et al., 2011), the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988), the Social Support Scale for Children (Harter, 1985), subscales of Buhrmester's Network of Relationship Inventory (Buhrmester, 1990), the 12-item Social Network Scale (Moody, 2001), the Adolescent Stress Questionnaire (Byrne et al., 2007), subscales taken from Manual for the self-perception profile for adolescents (Harter, 2012), as well as the Self-injurious Thoughts and Behaviours Interview (Nock et al., 2007).

Sample characteristics

There was a total of 5684 participants included in this review, which included: 51.33% (2917.6) male, 48.23% (2741.4) female, 0.22% (13) transmasculine, 0.19% (11) transfeminine, and 0.01% (1) non-binary. Ages ranged from 8 to 21 years old. Although the protocol stipulated a minimum age of 11 and maximum age of 17 for participants, Leung (2007) reported an age range of 8–18 and Donchi & Moore (2004) 15 to 21. It was not possible to separate the results by age, and as the majority of the sample falls within the range of the review, therefore we decided to include these studies in the review.

RESULTS SYNTHESIS

Stress

Two articles specifically discussed stress in relation to SNS use (Frison & Eggermont, 2015; Leung, 2007). Experiencing daily stress positively predicted adolescents seeking social support through Facebook, suggesting that adolescents turn to SNS for social support when experiencing stress (Frison & Eggermont, 2015). Additionally, Leung (2007) reported SNS as the most popular internet activity for participants to reduce stress. Thus, there is clear evidence that adolescents turn to SNS use when engaging with support seeking behaviours. However, because of the cross-sectional nature of the research, it is unclear whether seeking support from SNS positively impacts psychological distress. Given that adolescents are already utilising SNS as a source of social support, it would be prudent for future research to examine the potential impacts of these behaviours on mental health in a longitudinal design.

Perceived social support

Six articles discussed perceived social support from SNS use (Frison & Eggermont, 2015, 2016; Selkie et al., 2020; Subrahmanyam & Lin, 2006; Tseng & Yang, 2015; Wang et al., 2017). When participants sought social support through Facebook and subsequently perceived that support to be forthcoming, social support seeking through Facebook was associated with a decrease in depressed mood (Frison & Eggermont, 2015). Equally, when social support was sought by participants and not perceived, social support seeking through Facebook was associated with increased depressed mood (Frison & Eggermont, 2015). Similarly, Frison & Eggermont (2016) and Wang et al. (2017) also reported that perceived social support was associated with reduced depressed mood. Perceived social support was also associated with lower levels of rumination (Wang et al., 2017). The key characteristic of rumination is focusing on a negative emotional state, and consequently, rumination is positively associated with depression (Nolen-Hoeksema, 1991; Wang et al., 2017). Thus, the effects of perceived social support via SNS use on depressive symptoms may be mediated by rumination.

Wang et al. (2017) reported that authentic online self-presentation (presenting your true self online) was positively associated with perceived social support and negatively associated with depression and rumination. They hypothesised that adolescents presenting authentically on SNS could perceive social support, which reduces the tendency to ruminate and thereby reduces depression (Wang et al., 2017). Thus, how adolescents present themselves on SNS could impact how they perceive social support, with resultant impacts on their psychological state.

Some adolescents were having large numbers of online friends seemed to increase their perception of social support (Best et al., 2015). There is some evidence that how helpful or unhelpful social support is for an individual can depend on the kind of peers the support is coming from; for example, familial support had protective effects against non-suicidal self-injury, whereas support from significant others did not provide protective effects (Tseng & Yang, 2015). Adolescent self-esteem was affected only by the tone of the feedback they received on their profiles. Positive feedback enhanced adolescent self-esteem. However, the number of relationships did not impact social self-esteem (Valkenburg et al., 2006).

In a qualitative study exploring transgender adolescents' use of social media for social support, Selkie et al. (2020) detailed facets of social support and how they related to SNS use for participants. This included emotional support, where participants described social media as a place where they could find other transgender people to interact with; appraisal support, where participants described feeling validated by transgender-related social media content; and informational support where participants commented on the ability to get information from other transgender people about gender as a helpful aspect of SNS (Selkie et al., 2020). Transgender adolescents are at increased risk of mental health difficulties due to family and peer rejection, stigma, internalised transphobia and many other factors (Connolly et al., 2016). In addition, transgender adolescents are less likely to seek mental health treatment due to discrimination and inadequate provider training (Guss et al., 2015). Thus, social support accessed via SNS may serve as a protective factor for transgender adolescents.

Type of SNS use

Two papers explored participant approaches to SNS use; active and passive use of Facebook (Frison & Eggermont, 2016) and the use of instant messaging, a function most SNS platforms have that allows people with accounts to communicate (Valkenburg & Peter, 2007) privately. Passive Facebook use, defined as viewing the content of other people's profiles and monitoring their lives without engaging with them, was positively associated with depressed mood, especially in girls (Frison & Eggermont, 2016). Active Facebook use, defined as interacting with other Facebook users in a private (instant messaging) or public (status updating, commenting on others status') setting, was not associated with depressed mood in adolescents (Frison & Eggermont, 2016). Valkenburg & Peter (2007) examined the use of instant messaging and active private use of SNS and found that participants spent a greater amount of time using instant messaging than other forms of SNS use. Adolescents were mostly using instant messaging to communicate with existing friends (Valkenburg & Peter, 2007). Engaging in active Facebook users, either publicly or privately, positively predicted perceptions of online social support, subsequently decreasing adolescent depressed mood (Frison & Eggermont, 2016). Thus, it is possible that passive use of SNS by adolescents' reduces perceptions of social support, with negative implications for depressed mood.

Sex differences

Three papers provided evidence of differences in how males and females experience SNS use (Donchi & Moore, 2004; Frison & Eggermont, 2016; Tseng & Yang, 2015). Adolescent females who engage in active Facebook use in public or private settings and perceive social support from other Facebook users benefit as perceived online social support negatively predicted depressed mood in females (Frison & Eggermont, 2016). There were no differences between adolescent males and females regarding passive Facebook use and perceived social support (Frison & Eggermont, 2016). Passive Facebook use predicted depressed mood in girls, and active public Facebook uses positively predicted boys' depressed mood (Frison & Eggermont, 2016). In addition, Donchi & Moore (2004) found that online friendships were associated with better well-being for girls but not for boys. Higher numbers of regular online friendships amongst boys were related to lower self-esteem and greater loneliness (Donchi & Moore, 2004). Communicating using SNS was identified as a risk factor for self-injurious thoughts and behaviours in boys but not in girls (Tseng & Yang, 2015).

Online vs offline friends

Four papers discussed adolescent friendships dichotomised by online and offline friendships (Best et al., 2015; Donchi & Moore, 2004; Subrahmanyam & Lin, 2007; Valkenburg & Peter, 2007). Best et al. (2015) reported that the majority of participants used SNS to chat with offline friends (76.6%), whereas chatting with strangers (7.4%) was the least reported activity, and 64% stated they felt SNS strengthened their offline friendships. The amount of time spent online was not related to adolescents' perceptions of support from significant others (Subrahmanyam & Lin, 2007). The number of friendships a person had offline, and the perceived importance of those friendships, positively predicted well-being for both boys and girls (Donchi & Moore, 2004). Alternatively, the number of online friendships and their importance negatively predicted well-being for boys (Donchi & Moore, 2004). The time spent using instant messaging was positively related to the time spent with existing friends offline, and the perceived quality of the friendships positively predicted well-being (Valkenburg & Peter, 2007). Although there is clearly a marked difference in how adolescents value offline vs online friendships, it is never suggested that online friends are unimportant, with some commenting that online friendships evoked feelings of belonging and togetherness (Best et al., 2015).

DISCUSSION

As SNS continue to be the preferred method of communication for adolescents, it is of increasing importance to examine the possible benefits and detriments of SNS use to adolescent mental health due to the associated risk for poor mental health in later life and the subsequent societal and economic burden it represents. Social support is frequently reported as a positive outcome associated with SNS use and the buffering effect it can have against stress and promoting positive mental health. This systematic review aimed to identify and synthesise literature that has examined SNS use, social support and mental health in adolescents. Several key findings are highlighted in the current review.

An important finding is that adolescents use SNS to access social support when experiencing stressful life events. In these circumstances, it appears that perceptions of social support via SNS are critical to enabling the positive impact of SNS use on mental health. SNS allow marginalised and isolated individuals to access support that might not otherwise be accessible through their offline family and friends. This is illustrated by Selkie et al. (2020), who examined transgender adolescent experiences of SNS use and additionally supported by Li & Peng (2019), who reported that international students experienced less acculturative stress when using SNS to communicate with host country nationals and perceived increased levels of social support (Li & Peng, 2019).

Different methods for engaging with SNS appear to have different impacts on adolescent mental health, particularly in terms of active or passive use. This supports existing research that details different types of internet activity associated with different outcomes for depressive symptoms in adolescents (Vidal et al., 2020). Using the internet for information searching was associated with lower depressive symptoms, however using the internet to communicate or play games for more than four hours a day was associated with greater-depression like symptoms (Vidal et al., 2020).

There are clear variations between genders in SNS use and the impact it has on adolescent mental health. This is consistent with research identifying gender differences in how adolescents engage with social media. However, the overall picture of these differences is not clear. Literature has highlighted that higher social media use at age ten was associated with declines in well-being for females but not males (Booker et al.,

2018), whereas other results have shown that females on SNS give and receive greater social support than do males, which has an impact on well-being (Tifferet, 2020).

Adolescents use SNS to talk to and strengthen relationships with people they know offline rather than talking to strangers who are unknown to them. The included papers approach online and offline friends as two distinct groups. However, the findings do not support this dichotomy. In a study by O'Reilly et al. (2019), adolescent participants reported experiencing difficulty separating the two worlds of online and offline friendships: *'You can't just turn off your phone and leave it, 'cos like the two worlds are so like intertwined that if you're not, you're almost like a weird outcast'.* Their research highlighted that SNS is not an addition to adolescent lives but a core part of peer relationships (O'Reilly et al., 2019).

All the studies included in the current review were carried out before the COVID-19 pandemic, and we do not know whether these findings would be the same during the pandemic. However, evidence suggests that social media can be a positive coping strategy for adolescents experiencing loneliness and anxiety during COVID-19 quarantine (Cauberghe et al., 2021).

Evaluation of the reviewed studies

Ten of the eleven included studies report using surveys to collect data; accordingly, there is a risk of self-report bias. In addition, the quality assessment indicated that most studies did not report their response rate, so we were unable to determine the risk of non-response bias. Causation cannot be inferred as the included studies all adopted a cross-sectional design.

There was considerable variation in how SNS use was measured in the included studies from two-items to measure support seeking through Facebook (Frison & Eggermont, 2015) to a combination of items from different established questionnaires addressing different aspects of the internet use and communication (Relojo-Howell, 2021; Tseng & Yang, 2015). This area of research would benefit from the development of objective and timely measures of SNS use specifically for adolescent samples that reflect the reality of how adolescents use SNS as social media platforms are continuously evolving.

There is a clear difference in the impact of public and private SNS use, including the use of instant messaging highlighted in the included papers. However, variation in the type of SNS use across different platforms is not explored. This is an important point to note as the average internet user holds between 8 and 9 social media accounts, and each platform serves a different purpose for the user (Statista, 2021; Verduyn et al., 2017). For example, platforms such as Facebook are primarily used for leisure (Verduyn et al., 2017). Similarly, the dominant mode of communication varies between platforms; for example, Twitter is mainly text-based, and Instagram is image-based, these differences are not explored in the literature with different types of SNS being generally combined, or the findings from research focussing on one platform being generalised across all SNS (Verduyn et al., 2017).

Mental health can be thought of as a continuum rather than being a strictly binary state of either poor or good mental health, particularly for individuals experiencing severe mental health problems undergoing prolonged treatment. For this reason, the lack of longitudinal work is a limitation of this review. How an individual engages with SNS can change over time; for example, Vidal et al. (2020) reported that adolescents' use of SNS shifted from negative to positive while undergoing treatment for clinical depression. In addition, longitudinal research had found that using SNS over three years was not related to depressive symptoms in participants aged between 17 and 19 when the study began (Stockdale & Coyne, 2020).

There is some exploration of the difference between how adolescent males and females experience using SNS; however, there is no exploration of the non-binary, transmasculine or trans feminine in these studies. As Selkie et al. (2020) highlight, SNS are a means of developing a support system for non-cisgender individuals. As a group, these individuals are particularly vulnerable to mental distress due to factors such as increased experiences of stigma, isolation and abuse, and have a higher than average suicide prevalence (Connolly et al., 2016); therefore, this is an area in need of more research. Further to this, exploring why active public Facebook uses positively predicted boys' depressed mood is of great importance. Qualitative research would be well placed to explore the differences in how adolescent boys and girls approach and experience SNS use, social support and the impact it has on mental health.

Limitations of the current review

There was an under-representation of SNS platforms such as Twitter and Instagram, as most of the research has focused on Facebook, which probably reflects the popularity of the platform and its longevity (15

years). A search of the grey literature was not a part of this systematic review. However, this may have produced more research that met the criteria for inclusion.

Conclusion

This review draws on the available evidence and highlights gaps in the literature that require additional research to further the understanding of the relationships between the use of social network sites, social support, and mental health in adolescents. Key findings from this review show that adolescents use SNS to access social support when experiencing stressful life events and perception of support is crucial. Although there is good quality research in this area, it is mostly cross-sectional, correlational, and limited in terms of exploration of the relationships between SNS use, social support and adolescent mental health. This research area will benefit greatly from qualitative research exploring adolescent perspectives and longitudinal work examining how SNS use, perceived social support and the impact on adolescent mental health changes over time.

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