


Loneliness and Its Association With Social Media Use During the COVID-19 Outbreak

Social Media + Society
July-September 2021: 1–10
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DOI: 10.1177/20563051211033821
journals.sagepub.com/home/sms


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Abstract

Social distancing rules during the COVID-19 pandemic changed social interaction for many and increased the risk of loneliness in the general population. Social media use has been ambiguously related to loneliness, and associations may differ by age. The study aimed to examine loneliness and its association with social media use within different age groups during the COVID-19 pandemic. A cross-sectional online survey was conducted in Norway, the United Kingdom, the United States, and Australia during April/May 2020, and 3,810 participants aged 18 years or above were recruited. Multiple regression analyses were conducted to examine associations between social media use and social and emotional loneliness within separate age groups. Emotional loneliness was higher among young adults and among those who used social media several times daily. Adjusting by sociodemographic variables, using more types of social media was associated with lower social loneliness among the oldest participants, and with higher emotional loneliness among the youngest participants. Among middle-aged participants, using social media more frequently was associated with lower social loneliness. We found that the associations between social media use and loneliness varied by age. Older people's engagement on social media may be a resource to reduce loneliness during the COVID-19 pandemic. We observed higher levels of loneliness among high-frequent social media users of younger age.

Keywords

coronavirus, cross-national study, pandemic, social distancing

Introduction

Loneliness can be understood as comprising three core components (Bekhet et al., 2008). First, loneliness indicates that there is a perceived lack or deficiency in a person's social network, meaning that relationships with other people are missing, scarce, or in other ways inadequate. Second, loneliness cannot be objectively assessed, for example, by an external observer. By its nature, feelings of loneliness are based on the perception of the person, essentially underscoring that loneliness is a subjective experience. Third, the experience of loneliness is unpleasant and distressing. Thus, while people sometimes want to be left alone (for a while), they generally do not want to be lonely. Consequently, at its core, loneliness emerges when a person feels a lack of relationships with others, and it highlights the emotional distress present due to this lack of connection with others. While acknowledging a common core of the loneliness experience,

several authors, building on Weiss' (1973) seminal work, have differentiated between two types of loneliness, often denoted as social and emotional loneliness (Dahlberg & McKee, 2014; de Jong Gierveld & Van Tilburg, 2010; DiTommaso & Spinner, 1997; Dykstra & Fokkema, 2007; Russell et al., 1984). In general terms, social loneliness refers

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to the lack of an acceptable social network and is concerned with having a sufficient number of relationships with other people. Emotional loneliness, on the other hand, is concerned with intimacy in the relationships and feelings of attachment (Dahlberg & McKee, 2014; Dykstra & Fokkema, 2007). This study builds on this nuanced conceptualization of loneliness.

Loneliness has received much attention during the COVID-19 pandemic. In the early days of the pandemic outbreak, people were instructed to practice social distancing (World Health Organization, 2020). Essentially, this implied maintaining a physical distance from people outside the household and when possible staying at home to prevent spreading the coronavirus. Schools and nurseries were closed, as were many shops and businesses (Blustein et al., 2020), leading to an abrupt increase in unemployment rates internationally (International Labor Organization, 2020). Those who were able to work from home continued to work in a sheltered environment. Due to the restrictive social distancing policies and a general sense of uncertainty during the COVID-19 outbreak, the population's mental health has been subject to worldwide growing concern (Haider et al., 2020; Kaufman et al., 2020; Mi et al., 2020; Serafini et al., 2020). Specifically, one concern related to the implementation of pandemic guidelines is that feelings of loneliness may increase due to increased social distancing practices (Bonsaksen et al., 2021; Luchetti et al., 2020; Palgi et al., 2020).

Despite somewhat differing conceptualizations and measurement methods, loneliness has consistently been found to be associated with poorer mental health. For example, researchers have found associations between loneliness and depression (Beutel et al., 2017; Luanaigh & Lawlor, 2008; Palgi et al., 2020; Santini et al., 2016; Victor & Yang, 2012), anxiety (Beutel et al., 2017; Palgi et al., 2020), suicidal ideation and behavior (Beutel et al., 2017; Stickley & Koyanagi, 2016), and moderate to severe psychological distress in general (Richard et al., 2017). Loneliness and its relationship to mental health problems among older people have received much research attention (Alpass & Neville, 2003; Bekhet & Zauszniewski, 2012; Gerino et al., 2017; Losada et al., 2012; Santini et al., 2016). However, in a study of a general population sample from Germany, 10.5% of the total sample of participants reported some degree of loneliness, with more loneliness found among young people and less loneliness found among older people (Beutel et al., 2017). In addition, loneliness was higher among women, those living alone, and those without a partner. Among those of younger age, a longitudinal study of British undergraduate students found that loneliness predicted more depression, anxiety, and general mental health problems over time (Richardson et al., 2017). There was no evidence that mental health problems increased loneliness over time; thus, a causal pathway from loneliness to subsequent mental health problems was suggested (Richardson et al., 2017).

Across the world, the use of social media has become widely adopted in people's everyday lives (Boulianne, 2015; Chou et al., 2009). In this context, social media is referred to as applications that allow users to engage in virtual interactions, with broader or narrower audiences (Meier & Reinecke, 2020). "Interactions" should be understood broadly—while social media-based interaction may occur as direct interactions between people at a given point in time, more delayed forms of interaction, such as looking at or reading another person's social media posting hours or days later, are common ways to use social media. However, as the latter form may be considered passive media consumption, rather than interaction (in the ordinary meaning of the word), recent research has suggested that the level of interactivity should be considered a core dimension in the conceptualization of social media use (Kaye, 2021). Further, people typically speak of social media as brands—for example, they use Twitter, Facebook, Instagram, and so on. While studies have often examined which brands of social media are most frequently used within a given population or context (e.g., Martin et al., 2018), one can assume that using several brands of social media regularly will be related to a larger total amount of time spent interacting with them, and possibly also to a general preoccupation with social media and "fear of missing out" (Fumagalli et al., 2021; Hunt et al., 2018).

In relation to loneliness and mental health, it has been argued that social media may serve as a source of social connection and inclusion, and may therefore prevent or provide relief from loneliness (Morahan-Martin & Schumacher, 2003; Nowland et al., 2018; Thomas et al., 2020). The alternative reasoning suggests that social media may serve as a substitute for real-life social relationships. Specifically, social media may create and sustain new stressors, such as "fear of missing out," and high-frequent social media use may therefore be viewed as indicative of poorer mental health, as shown in recent studies (Geirdal et al., 2021; Hunt et al., 2018). Research has also suggested that different aspects of the social media experience may produce different effects for different groups of people. For example, Phu and Gow (2019) reported that a higher number of Facebook friends were associated with lower loneliness, while more persistent use, indicating higher emotional connectedness to the use of social media, predicted higher levels of loneliness. Yang (2016) focused on the interaction between patterns of use and the users' personality traits, and found that using social media for browsing and interaction was associated with lower loneliness, but only for participants with low social comparison orientation. Pittman and Reich (2016) differentiated between types of social media, reporting results in support of image-based social media being able to provide enhanced intimacy, whereas text-based social media was not. While effects are complex and differ depending on the social media and outcome indicators used, a recent meta-review found an overall small and negative association between

social media use and mental health (Meier & Reinecke, 2020).

The above literature review suggests that social media use is multi-dimensional, and that complex relationships exist between social media use and its impacts on different groups of people. Social media use is often measured with estimates of time use, varying between measures such as frequency of use within a given time frame (e.g., Geirdal et al., 2021) and more specific measures such as the number of minutes or hours spent on social media during a typical day (e.g., Ellison et al., 2007). Clearly, research efforts need to go beyond establishing simple associations between social media use and various outcomes of interest. By far, social media is more frequently used within the younger age groups (Feng et al., 2019). Patterns and motives for their use have been shown to vary between younger and older people (Kircaburun et al., 2020), and thus, social media use may be differently linked with loneliness across different age groups. More knowledge about the use of social media in different age groups, and how social media may be associated with loneliness in these groups, can add nuance to our understanding of social media and its significance for people of varying ages. Therefore, in this study, historically situated within the COVID-19 pandemic, the relationship between loneliness and social media use is explored by age.

Study Aim

The aim of this study was to examine loneliness and its association with social media use within different age groups during the COVID-19 pandemic.

Methods

An invitation to participate in this self-administered survey was distributed via different social media in Norway, the United States, the United Kingdom, and Australia during April and May 2020. Each country had a landing site for the survey at the researcher's universities; OsloMet—Oslo Metropolitan University, Norway; University of Michigan, USA; University of Salford, UK; and the University of Queensland, Australia, respectively. The initiator of the project was A.Ø.G. from OsloMet, but all countries and universities had their own head of the project, due to ethical considerations and permissions. The survey was translated from Norwegian to English by the researchers according to language and cultural contexts. To be included in the study, participants had to be 18 years or older, understand Norwegian or English, and live in Norway, the United Kingdom, or Australia.

Measures

Sociodemographic Characteristics. Sociodemographic variables included age group (18–24, 25–29, 30–34, . . . , 85 years

and above), sex (male vs. female), highest completed education level (high school, associated/technical degree or lower vs. bachelor's degree or higher), cohabitation (living with someone else vs. not), employment status (having full- or part-time employment vs. not), and living area (rural/farming area, small town, medium-sized city, large city). For the analysis, age groups were collapsed into 18–39, 40–59, and 60 years and above, representing young, middle-aged, and old participants, respectively.

Loneliness. The loneliness scale (de Jong Gierveld & van Tilburg, 2006) consists of six statements, all of which are rated from 0 (*totally disagree*) to 4 (*totally agree*). It was designed to measure two different aspects of loneliness, social loneliness (e.g., “There are plenty of people I can rely on when I have problems”) and “emotional loneliness” (e.g., “I experience a general sense of emptiness”). Previous factor-analytic studies have found the six statements to load on two different factors, and that they therefore should be treated as constituting two different scales reflecting the two different aspects of loneliness (Bonsaksen et al., 2018; de Jong Gierveld & van Tilburg, 2006). Cronbach's α s in this study were .66 (mean inter-item correlation: .39) and .86 (mean inter-item correlation: .68) for the emotional loneliness and social loneliness scales, respectively. For both scales, the score range was 0–12 with higher scores indicating more loneliness.

Social Media Use. Based on a list of the most widely used social media in the United States (Perrin & Anderson, 2019), the participants were asked to indicate (yes vs. no) whether they had used any of the following 10 social media channels: Facebook, YouTube, Snapchat, Instagram, LinkedIn, Twitter, Pinterest, WhatsApp, Reddit, and Tumblr. As the first indicator of how strongly social media were integrated with the participants' lives, the number of social media used was calculated by adding the affirmative responses. To establish a second indicator of social media's integration with the participants' lives, the participants were asked how often they had used social media in general (i.e., not for each type of social media) after the COVID-19 outbreak. Response options for this question were monthly or less frequently (1), weekly (2), a few times per week (3), daily (4), or several times daily (5).

Statistical Analysis

Social and emotional loneliness (means and standard deviations) were calculated for each category of the independent variables: age group, sex, education level, cohabitation, employment status, living area, and social media use. Depending on the number of group categories, group differences were examined using the one-way analysis of variance (ANOVA) with Bonferroni correction, and the independent t test. Adjusted associations between independent variables and social and emotional loneliness were assessed with

multiple linear regression analyses. Within each age group, social and emotional loneliness was assessed in relation to the number of social media used and frequency of use, while adjusting for sex, education level, cohabitation status, and employment status. Statistical significance was set at $p < .05$. Missing values were handled with the case-wise deletion procedure, resulting in n varying between analyses.

Ethics

The data in this cross-sectional and cross-country study were collected anonymously. All ethical rules were followed in each country. The study was thereby quality assured and approved by OsloMet and the regional committees for medical and health research ethics (REK; ref. 132066) in Norway, reviewed by the University of Michigan Institutional Review Board for Health Sciences and Behavioral Sciences (IRB HSBS), and designated as exempt (HUM00180296) in the United States, by University Health Research Ethics (HSR1920-080) in United Kingdom, and (HSR1920-080; 2020000956) in Australia.

Results

Participants

The sample consisted of 3,810 individuals from Norway (20.2%), the United States (36.6%), the United Kingdom (36.0%), and Australia (7.2%). In the whole sample, 37.2% were under the age of 40 years, 40.7% were aged 40–59 years, while 21.9% were aged 60 years or above. The majority (79.6%) were women, and 74.0% had education at the bachelor's degree level or higher. Full- or part-time employment was held among 70.7%, while 61.4% lived with a spouse or partner. Social media was used daily or less frequently among 27.8% of the sample, while a majority (71.5%) reported the use of social media several times daily. On average, the participants reported using four different social media brands.

In the total sample, the mean score on social loneliness was 3.92 ($SD=3.01$) and the mean score on emotional loneliness was 6.03 ($SD=2.68$). Table 1 displays the levels of social and emotional loneliness according to sociodemographic characteristics and use of social media in sample subgroups. Social loneliness did not differ between age groups, while emotional loneliness was higher among the younger age groups. Compared to women, male participants had higher social loneliness and lower emotional loneliness. Social and emotional loneliness varied significantly by the education level, cohabitation, and employment status, with higher levels of loneliness among those with lower education, without a partner, and without employment. While there were significant differences in loneliness between living areas, these differences did not follow a linear pattern. Significant group differences in social and emotional

loneliness were also revealed for different frequencies of social media use. Due to the large differences in group sizes, these analyses were re-run using a dichotomized social media use variable (several times daily vs. daily or less often). Using the dichotomized variable, social loneliness was not significantly different between the groups, whereas emotional loneliness was significantly higher among those using social media several times daily, compared to those using social media daily or less frequently ($M=6.19$ vs. $M=5.65$, $p < .001$).

Adjusted Associations Between Social Media Use and Loneliness

The results from the linear regression analyses are reported in Table 2. Adjusted for sociodemographic variables (sex, education, cohabitation, and employment), social media use was not associated with social loneliness among those aged 18–39 years. Among those aged 40–59 years, using social media more frequently was associated with lower levels of social loneliness ($\beta = -.06$, $p < .05$). Among those in the oldest age group, the use of more social media platforms was associated with lower social loneliness ($\beta = -.10$, $p < .05$). Among the sociodemographic variables, cohabitation and employment were consistently associated with lower reported social loneliness.

Among participants in the youngest age group, using more social media platforms was associated with higher levels of emotional loneliness ($\beta = .09$, $p < .01$). Social media use was not associated with emotional loneliness among those in the middle or old age groups. Across age groups, having higher education and living with a spouse or partner were consistently associated with lower emotional loneliness.

Discussion

This study aimed to examine loneliness and its association with social media use within different age groups during the COVID-19 pandemic. Unadjusted analyses revealed that compared to their counterparts, emotional loneliness was higher among those in the youngest age group and among those using social media several times daily. Adjusting for sociodemographic variables, using more social media platforms was associated with lower social loneliness among the oldest participants, while it was associated with higher emotional loneliness among the youngest participants. Among those aged 40–59 years, using social media more frequently was associated with lower levels of social loneliness. The sociodemographic variables were associated with social and emotional loneliness in a mostly consistent pattern across age groups.

In this study, levels of social loneliness were similar across age groups, whereas emotional loneliness was higher among those in the youngest age group. Thus, it appears the

Table 1. Social and Emotional Loneliness According to Sociodemographic Characteristics and Frequency of Social Media Use.

Characteristics	Social loneliness				Emotional loneliness			
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>p</i> value	<i>n</i>	<i>M</i>	<i>SD</i>	<i>p</i> value
Age group (years)				.65				<.001
18–39	1,415	3.94	3.00		1,417	6.70	2.63	
40–59	1,542	3.94	3.12		1,541	5.77	2.66	
60+	826	3.83	2.82		826	5.39	2.57	
Sex				<.01				<.01
Male	715	4.25	3.12		716	5.72	2.85	
Female	3,016	3.81	2.97		3,016	6.08	2.63	
Education level				<.001				<.001
High school or lower	983	4.41	3.20		982	6.54	2.81	
Bachelor's degree or higher	2,805	3.75	2.93		2,807	5.86	2.62	
Cohabitation				<.001				<.001
Yes	2,327	3.46	2.80		2,324	5.57	2.54	
No	1,201	4.59	3.17		1,201	6.92	2.76	
Employment				<.001				<.001
Full- or part-time	2,679	3.70	2.96		2,681	5.93	2.64	
No	1,109	4.45	3.07		1,108	6.29	2.77	
Living area				<.01				<.01
Rural/farming area	279	3.76	3.15		277	5.55	2.93	
Small town	837	4.07	3.04		839	5.92	2.60	
Medium-sized city	1,221	4.13	3.02		1,224	6.23	2.66	
Large city	1,452	3.69	4.95		1,450	6.03	2.69	
Social media use				<.05				<.001
Monthly or less frequent	15	4.80	3.03		15	5.40	2.17	
Weekly	39	5.23	4.06		39	5.74	2.77	
A few times per week	106	4.20	2.83		105	5.79	2.58	
Daily	896	3.98	3.00		895	5.64	2.71	
Several times daily	2,707	3.88	3.00		2,711	6.19	2.67	

ANOVA: analysis of variance.

Statistical tests are one-way ANOVA *F* test (age groups, living area, and social media use) and independent *t* tests (all other variables). Cohabitation refers to “living with spouse or partner.”

level of social deprivation was similar across age groups, whereas the youngest participants were more inclined to suffer emotionally. This finding brings nuance to the knowledge about loneliness among young adults and underscores the significance of understanding the young person's psychological response to their social world. Relying on a mere count of the relevant social contacts may obscure rather than reveal loneliness in this age group. While much research has focused on loneliness problems among those of old age (Alpass & Neville, 2003; Bekhet & Zauszniewski, 2012; Gerino et al., 2017; Losada et al., 2012; Santini et al., 2016), a general population study from the United Kingdom found a U-shaped distribution with higher levels of loneliness among those younger than 25 years and older than 65 years (Victor & Yang, 2012). In Germany, Beutel and coworkers (2017) found a linear decrease in loneliness with increasing age. The international comparisons extend support to the notion that younger people (in addition to older aged individuals) may be particularly vulnerable to experiencing loneliness. However, measurement issues may also be relevant

for the understanding of loneliness in various age groups, as a large Norwegian general population study yielded differing results depending on whether direct (e.g., “Do you feel lonely?”) or indirect measures of loneliness (such as the loneliness scale used in this study) were used (Nicolaisen & Thorsen, 2014).

Adjusting for sociodemographic variables, using more types of social media was associated with lower social loneliness among those aged 60 years or above. Although this broadly composed age group consists of employed and retired individuals alike, people commonly experience a decline in social contact in older age (Cornwell et al., 2008)—due to, for example, retirement, reduced capacity for participation and socializing, own or others' health problems, or a combination of these. However, according to Havighurst's (1963) theory of active aging, life satisfaction may be best sustained if the old person maintains the roles and activities of middle life, with the necessary adjustments. For older persons, using and learning to use new social media may be one way of communicating and interacting with family, friends,

Table 2. Linear Regression Analyses Showing Adjusted Associations Between Social Media Use and Loneliness Within Age Groups.

Independent variables	Social loneliness			Emotional loneliness		
	Age 18–39 years	Age 40–59 years	Age 60+ years	Age 18–39 years	Age 40–59 years	Age 60+ years
Female sex	-.05	-.02	-.09*	.01	.02	.14***
Having higher education	-.11***	-.06*	-.01	-.09**	-.08**	-.08*
Living with spouse/partner	-.10***	-.21***	-.20***	-.23***	-.16***	-.13**
Having employment	-.07*	-.14***	-.08*	-.09**	-.13***	-.02
Number of SM used	-.02	-.02	-.10*	.09**	-.04	.04
Using SM more frequently	-.03	-.06*	-.02	.04	.05	.06
Explained variance (%)	4.3	8.0	6.2	9.8	5.9	5.8

SM: social media.

Table content is standardized β weights.

* $p < .05$. ** $p < .01$. *** $p < .001$.

and acquaintances, and may extend their social network. Thus, this way of using social media may indeed be a tool for preventing or reducing loneliness, as suggested from previous research (Nowland et al., 2018; Sum et al., 2008). During the COVID-19 situation, under circumstances where older people are generally considered at risk of a fatal outcome if infected by the coronavirus, their use of social media to stay in touch with others may be particularly important (Dahlberg, 2021). Even for those in the middle age group, using social media more frequently was associated with lower levels of social loneliness. Possibly, the loneliness burden arising from reduced opportunities to socialize with family, friends, and colleagues during the pandemic may be somewhat lifted by being able to connect with others via social media.

In contrast, using a larger number of social media was associated with higher emotional loneliness among those in the youngest age group. Although different measures of social media use are employed (number of social media used vs. frequency of use), a salient abstraction of the results is that while more use of social media was related to less loneliness among those of middle and old age, it was related to more loneliness among those of younger age. Possibly, the discrepancy may be explained by varying motives for social media use. Among the middle-aged and old participants, a motive for using social media may be stimulation—using social media to connect with others stimulates interaction and has been found to reduce loneliness over time (Teppers et al., 2014). In contrast, using social media to compensate for poor social skills in the real world has been associated with increased loneliness over time (Teppers et al., 2014). In addition, excessive use of social media (“Facebook addiction”) and the internet, in general, has been found to be related to higher levels of loneliness (Błachnio et al., 2016; Odacı & Kalkan, 2010). An inclination toward social comparison and toward presenting a “liminal self” (Kerrigan & Hart, 2016)—editing and re-inventing yourself online—may be stronger among younger compared to older adults. Compared to their counterparts, people with high social comparison orientation have been shown to have poorer

self-perception, lower self-esteem, and more negative affect balance (Vogel et al., 2015), and those presenting a liminal self on social media have been found to experience greater loneliness (Thomas et al., 2020). Such experiences can readily be aligned with the items comprising the emotional loneliness scale, such as feeling empty and rejected. Therefore, a stronger tendency among young adults toward social comparison (Callan et al., 2015) and possibly toward presenting with a façade may contribute to explain why more use of social media was related to more loneliness in the younger age groups.

Finally, one should consider these results in the COVID-19 context. It is possible that younger and middle-aged participants, to a larger extent than those of older age, use social media to seek information about the pandemic. Exposure to information about COVID-19 developments can also occur without being sought; the social media’s algorithms are designed to ensure that information presents itself in the newsfeed in part based on one’s own and one’s friends’ previous involvements (Alvarado & Waern, 2018). Possibly, attempts to disentangle the information from the disinformation—handling the “infodemic”—may add to the burden during already difficult times (Leung et al., 2020; Schoultz et al., 2021). In contrast, people in the oldest age group may still be inclined to seek and get their news from traditional media, such as newspapers, radio, and TV (Holt et al., 2013). Future research is needed to examine the motives and methods of social media use across generations, and their associations with loneliness.

Study Limitations

The study has several limitations. The data were collected using a cross-sectional online survey; therefore assumptions about causal relationships should not be made. Although loneliness is treated as an outcome in this study, it is equally possible that feelings of loneliness can increase social media use. The representativity of the four populations of the four respective countries is unknown. The sample had a majority

of female and urban participants, and the distributions of age and education were similar to general population statistics. Response to the general population-targeted advertisement in Australia was low, resulting in a large proportion of participants being recruited among followers of the university's social media postings. Thus, the Australian participants were commonly younger and had postgraduate degrees.

The sample was recruited through advertisements released by the university through social media and by personal postings and shares on social media. Thus, generalizing the results beyond a population of relatively frequent social media users should be done with caution. The degree of disease outbreak and social distancing policies differed between states within the United States, and between the four countries.

The study used relatively crude measures of social media use. In some analyses, frequency of use was dichotomized into two categories, and the number of social media used was calculated from a list of social media that is not extensive. However, the list was constructed based on well-known and popular social media channels (Perrin & Anderson, 2019). Cronbach's α of the emotional loneliness scale was lower than the recommended .70 threshold. However, lower internal consistency estimates are common for shorter scales (Ponterotto & Ruckdeschel, 2007; Streiner & Norman, 2008), such as the three-item emotional loneliness scale. However, the mean inter-item correlation ($r = .39$) well exceeded the .20 threshold that has been suggested for short scales (Briggs & Cheek, 1986).

The large age group intervals allowed for significant developmental differences between participants within the defined intervals. Thus, within age groups, there may be variations in social media use, loneliness, and their association that is not accounted for by this study.

Conclusion

This study examined loneliness and its association with social media use within different age groups during the COVID-19 pandemic. We found that the associations varied by age: using more social media, or using them more frequently, was associated with lower social loneliness among the middle-aged and old participants, while more social media use was associated with increased emotional loneliness among the younger participants. Thus, while younger people may be encouraged to spend their time differently, and/or to be more conscious about how they use social media, people in the older age group may use social media to find joy and possibility for connection with others during a time where regular social contact is severely limited.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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