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ORIGINAL RESEARCH

The impact of social media use on the relationship between social isolation and connectedness during COVID-19 in Hong Kong

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Abstract
The emergence of the COVID-19 pandemic has emphasised the importance of social connectedness, whilst the popularity of social media continues to rise. The present study examined the relationship between engagement on social networking sites (SNSs), social connectedness and social isolation in a sample of Hong Kong Chinese adults during the COVID-19 pandemic. A total of 232 participants (65% female) aged 18–65 years were recruited to a cross-sectional online study. SNS engagement was predictive of social connectedness in the present sample. Findings revealed that SNS engagement was associated with lower levels of social isolation. Younger participants reported greater engagement with SNSs, and lower levels of social isolation compared to older participants. However, older respondents reported greater levels of social connectedness. No gender differences were observed in social connectedness, but men reported significantly higher levels of social isolation compared to women. With the COVID-19 pandemic only just at an end, social restrictions have recently been lifted in Hong Kong, resulting in the significance of online communication becoming ever more important as a means of maintaining social connectedness.

Keywords Social media · Social connectedness · Social isolation · Wellbeing · Hong Kong

The popularity, significance and use of digital and social media has grown substantially in the last decade, an ever-increasing phenomenon of the 21st century that has become an essential part of people's lives (Ortiz-Ospinosa, 2019). Social media has changed the way we communicate with one another and how we access information (Ortiz-Ospinosa, 2019; Rosenfeld et al., 2019). Social networking sites (SNSs) are online platforms that allow users

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to create public or semi-public profiles and interact with other users. The most popular SNSs around the globe include Facebook, YouTube, WhatsApp, and WeChat (Statista, 2023a). Social media and SNSs are used for various reasons including networking, entertainment, communication, and sourcing information. Recent research suggests that social media is changing forms of group interaction, as well as changing both individual and collective behaviour (Tateno et al., 2019). This has resulted in increasing concerns of the potential negative impact on wellbeing. Excessive use has been associated with anxiety and depression, loneliness, and social isolation (Appel et al., 2020; Choi & Noh, 2019). Meanwhile other studies have identified a link between use of social media, reduced feelings of social isolation, and building a sense of connectedness and community among users (Twenge & Campbell, 2019; Ostic et al., 2021). There remains widespread concern about the long-term impact of the COVID-19 pandemic and its associated stressors on mental health and wellbeing. Social connectedness during COVID-19 has been identified as an important determinant of health and wellbeing (Okabe-Miyamoto & Lyubomirsky, 2021).

Members of social networks have access to a range of social support, information, and other resources resulting from their network membership and social connections (Bekalu et al., 2019). The shift to increasingly more time being spent online has led to questions about associations between digital media and health and wellbeing. Social connectedness is broadly defined as feelings of belongingness and closeness and feeling connected to others (Winstone et al., 2021), while loneliness and social isolation have been identified as public health risks (Lai et al., 2023; Rochelle, 2023). The extant literature has examined a range of indicators of wellbeing; the present study focuses on social isolation and social connectedness as two opposite ends of the same continuum (Franke et al., 2021).

SNSs have been shown to benefit wellbeing by increasing social capital (Hussenoeder, 2022; Ostic et al., 2021). Increased online communication has been shown to enhance wellbeing by expanding communication quantity and quality (Dienlin et al., 2017); time spent communicating online with family and friends has been linked to reductions in depression (Nagakomi et al., 2022). However, scholars disagree on the impact of SNSs. One longitudinal study found no changes in depression among adolescents (Scherr et al., 2019), suggesting no effect of SNS engagement on wellbeing. A growing body of evidence suggests that social media can impact negatively on health-related outcomes and wellbeing due to the increasing amount of time invested online coming at the expense of offline relations and activities (Lin et al., 2016). There is much evidence demonstrating that offline, real time, face-to-face connection is linked to better wellbeing (Adams et al., 2011; Ng et al., 2014). Researchers have argued that online communication lacks quality and depth, and thus does not bring the same benefits as face-to-face communication, reducing connectedness and increasing isolation among individuals (Yang et al., 2014). Others have shown that who people connect with online is a more important consideration (Okabe-Miyamoto et al., 2021).

The habit of being more permanently online and connected than ever before is leading to higher mental load due to multitasking, which can lead to higher stress and worse quality and quantity of sleep (Vorderer et al., 2017). The impact of the COVID-19 pandemic led to restrictions on free movement, social gatherings etc., being implemented by governments around the world; it will be interesting to explore how SNS engagement is linked with connectedness and isolation during the time of the pandemic. Although much evidence supports a negative association between wellbeing and SNS engagement, during the pandemic with

limitations and restrictions on face-to-face contact, this may have impacted on the importance of SNSs as a means of keeping in touch and feeling connected.

Research has consistently shown young people to be more engaged with social media and SNSs, and with higher rates of use than older people (Twenge & Campbell, 2019). However, the recent COVID-19 pandemic resulted in a context in which social media was proposed and promoted as a way of helping individuals to maintain contact with one another whilst isolated/separated and abiding by rules on restriction of movement etc. (Dixon, 2021). As such it could be expected that COVID-19 impacted on SNS engagement among adults of all ages, not just young people.

While studies have traditionally shown women to be more avid users of social media, more recent data has shown this gender gap to be closing, with greater gender parity now observed in use of digital and social media (Statista, 2023b). Gender differences have also been found in social support and social networks, with women generally reporting larger and wider networks of support than men (Kiely et al., 2021). Studies have found that while men report higher utilisation of resource-based social media tools, women have more of an emphasis on relationship-building platforms (Twenge & Martin, 2020). These gender differences could potentially impact on connectedness, and motives for using social media. Motives include social interaction, communication, information sharing, entertainment, and relaxation (Whiting & Williams, 2013). Studies have shown that motives for social media use are associated with social media engagement (Jarman et al., 2021), other research has made a distinction between using social media for social interaction and entertainment, and the differential impact on wellbeing (Wang et al., 2014).

1 The Case of Hong Kong

Hong Kong is a densely populated region located near the epicentre of COVID-19 in mainland China. The leading social media platforms in Hong Kong include WhatsApp, Facebook, Instagram, WeChat, and Signal (Oosga, 2024). Recent data reveals that over 91% of the population aged 18 and above use at least one social media profile (Kemp, 2023). The age profile of social media users in Hong Kong is predominantly younger; that said, up to a third of social media users in Hong Kong are middle aged or older (Oosga, 2024). There is relative parity in the gender distribution of social media users, with 55% of social media users female and 45% male (Kemp, 2023). Hong Kong is a digitally connnected city with eight in ten HongKongers spending two hours or more on social media platforms daily (Statista, 2024).

Immediately prior to the COVID-19 pandemic, a series of protests and demonstrations took place across Hong Kong throughout 2019 and early 2020 against the government's attempts to introduce a bill of amendment that resulted in the introduction of the National Security Law in 2020. Recent longitudinal research has shown that the wave of social unrest that took place across Hong Kong immediately prior to the pandemic had a significant negative impact on the mental health and wellbeing of Hongkongers (Ni et al., 2020).

Following initial reporting of COVID-19, Hong Kong immediately began to implement rigorous preventive measures with strictly enforced quarantine and social distancing protocols in place for over three years, from January 2020 until March 2023. By March 2020, Hong Kong had closed its borders to incoming non-residents, and banned indoor and out-

door public gatherings of more than four people, reducing to a maximum of two people at peak points during the pandemic; meanwhile food venues were required to operate at half capacity, while pubs and bars closed (HKSAR Government, 2023). Despite its geographical proximity and close connections to China, Hong Kong achieved a relatively low fatality rate (HKSAR Government, 2023). The immediate and comprehensive response to the pandemic was credited for the initial success in containing a local outbreak (Cowling et al., 2020). However, this comprehensive response to COVID-19 came at a price and meant that the community inhabited a prolonged and enforced period of social distancing and social isolation.

2 The Present Study

Increased online communication has been shown to enhance wellbeing by expanding communication quantity and quality (Dienlin et al., 2017); time spent communicating online with family and friends has been linked to reductions in depression (Nagakomi et al., 2022). However, the literature remains undecided. Despite a large body of literature examining the relationship between digital media and wellbeing, the findings remain mixed. Some studies link use of digital media to reduced wellbeing (Appel et al., 2020; Schemer et al., 2021), others have found that social media use can enhance health and wellbeing, by enhancing social connection and reducing feelings of loneliness and isolation (Dienlin et al., 2017; Hussenoeder, 2022). Some have found no link between digital media use and wellbeing (Berryman et al., 2017), while others have emphasised that what people do online, and who people spend time with online, is more important than the amount of time spent on digital media (Marino, 2018; Okabe-Miyamoto et al., 2021). Although the literature continues to expand, there is surprisingly little research examining the issue in the Chinese context. Much of the literature has been conducted in Western contexts, using majority white populations and/or student samples (Schemer et al., 2021; Twenge & Campbell, 2019). In these unprecedented times, it is also important to examine how the COVID-19 pandemic has impacted on SNS engagement, isolation, and connectedness. Thus, one of the overarching aims of the present study was to examine the association between digital media and wellbeing in a Chinese context during the COVID-19 outbreak in Hong Kong. The present study examines the relationship between SNS engagement, social isolation, and social connectedness during the COVID-19 outbreak in Hong Kong. Based on previous research, it was hypothesized that:

H_1: SNS engagement will lead to more social connectedness (H_1).
H_2: SNS engagement will lead to less social isolation (H_2).
H_3: Age differences will be observed in SNS engagement, social isolation, and social connectedness. Younger adults are expected to report greater SNS engagement than older adults (H_{3a}), more social connectedness (H_{3b}), and lower levels of social isolation (H_{3c}).
H_4: Gender differences will be observed in social connectedness and isolation. Women are expected to report greater social connectedness (H_{4a}) and lower levels of isolation (H_{4b}).

3 Methodology

3.1 Participants & Procedure

The study adopted a cross-sectional online design. Inclusion criteria: Hong Kong Chinese, aged ≥ 18 years, and possession of at least one social media account. As the purpose of the study was to examine social media use, a convenience sample of participants were recruited online via social media platforms, including adverts on Facebook, and through a participant pool advertising the study to students in a higher education institution in Hong Kong. Online recruitment also suited the COVID-19 pandemic climate of minimising physical contact. Interested parties were directed to further information about the study in the form of an online participant information sheet via a URL before providing informed consent. Participation was voluntary, no payment or incentive was provided. Data were collected via QuestionPro during November 2020.

3.2 Measures

The online survey consisted of the following five domains:

Social Network Site Engagement The Facebook Intensity Scale (FBI; Ellison et al., 2007) was used to measure participants' engagement with social network sites. The FBI was originally developed to examine Facebook use but has since been widely used to examine engagement with social network sites in general, including in the Chinese context (Cheng et al., 2019). In the present study, the term 'Facebook' was replaced with 'social media', for example: '*Social media is part of my everyday activity*'. The FBI is an 8-item measure with items measured on a 5-point scale (1 = Strongly Disagree to 5 = Strongly Agree). Total scores are averaged, with higher scores indicating greater engagement with social networking sites. The scale had robust reliability ($\alpha = 0.74$).

Motives for SNS Use The Motives for Facebook Use (MFU; Hollenbaugh & Ferris, 2014) was used to examine participant's motives for using SNS. The MFU is a 24-item designed to measure motives across the following five areas: virtual community, companionship, exhibitionism, relationship maintenance, and passing time. The MFU was originally developed to examine Facebook use but has since been widely used to examine engagement with social network sites more broadly. The term 'Facebook' was replaced with 'social media' in the current study, for example: '*I use social media to meet new people*'. Items are measured on a 5-point scale (1 = Very Unlikely to 5 = Very Likely). Items for each domain are averaged, with higher scores indicative of stronger motives. Cronbach's alphas for the five motives ranged from $\alpha = 0.84$ to $\alpha = 0.88$ indicating robust reliability.

Social Isolation The Lubben Social Network Scale-Revised (LSNS-R; Lubben et al., 2002). The LSNS-R was adopted to examine social isolation. The LSNS-R is a 12-item measure examining two domains of social networks, namely kin and non-kin. The LSNS-R examines social network size and interactions (i.e. *How many relatives/friends do you see at least once a month*) with items measured on a 5-point response format (None to 10 or more people). The measure has been used previously in a Chinese context (Ng et al.,

2014). In the present study items were reverse-scored to gauge levels of social isolation, with higher scores representing greater levels of social isolation. The scale had robust reliability (α = 0.79).

Social Connectedness The Social Connectedness Scale Revised (SCS-R; Lee et al., 2001) was used. The SCS-R is a 20-item measure consisting of 10 positive and 10 negative statements concerning social connectedness. Items include: '*I am able to relate to my peers*' and are measured on a 6-point scale (1 = Strongly Disagree to 6 = Strongly Agree), with negatively worded items reverse-scored. Items are summed, with higher scores indicating greater social connectedness. The scale had very robust reliability (α = .91).

Sociodemographics The survey contained a number of items relating to personal characteristics, including gender, age group, educational attainment, and employment.

3.3 Analysis

Data were analysed using IBM SPSS 27. Preliminary analysis including descriptive statistics and a correlation matrix examining associations between key variables was initially conducted. This was followed by t-test analyses to examine age, gender, and educational differences between key variables. Finally, a linear regression analysis (see Table 1) was conducted to examine predictors of social connectedness. Data were screened for multicollinearity no issues were identified; VIF values for variables included in the analysis ranged from 1.00 to 1.86. Statistical assumptions for normality were tested using the White test ($\chi^2 = 58.17$, $p = .06$) and modified Breusch-Pagan test ($\chi^2 = 0.05$, $p = .83$), both were non-significant, demonstrating normal data distribution.

4 Results

The sample consisted of 232 Hong Kong Chinese adults aged 18 to 65 years (65% female). Over two thirds (69%) of the sample had obtained a bachelor's degree or above, and 72% were employed. A correlation analysis was initially conducted where several significant associations were observed. SNS engagement was positively associated with social connectedness, although the association was not significant ($r = .11$), offering no preliminary support for H_1. SNS engagement was significantly negatively associated with social isolation ($r = -.20$**), indicating that SNS engagement was linked with lower levels of social isolation, providing preliminary support for H_2.

Three independent samples t-test were conducted to examine age, gender, and educational differences between key variables. Age was grouped into younger (≤35yrs) and older (≥36yrs) age. Younger participants ($M = 3.81$, $SD = 0.60$) were significantly more likely engage with SNSs than older participants ($M = 3.55$, $SD = 0.57$; t (230) = 3.30, $p = .001$), supporting H_{3a}. The magnitude of the differences in the means ($MD = 0.25$, *95% CI*: 0.10 to 0.41) was moderate ($eta^2 = 0.05$), meaning that 5% of the variance in SNS engagement can be explained by age. Significant differences were observed in social isolation, older participants ($M = 29.35$, $SD = 8.32$) reported greater social isolation compared to younger

participants (M=27.03, SD=7.92; t (230) = -2.18, p=.03), whilst conversely also reporting greater levels of social connectedness (M=82.93, SD=12.80) than younger respondents (M=78.42, SD=12.66; t (230) = -2.70, p=.008). The magnitude of the differences in the means for both social isolation (MD = -2.33, *95% CI*: -4.43 to −0.23, eta^2=0.02) and social connectedness (MD = -4.515, *95% CI*: -7.80 to -1.21, eta^2=0.03) was small. Findings reveal that H_{3b} was not supported as older, not younger adults, reported greater levels of social connectedness. Support was shown for H_{3c}, younger adults reported significantly lower levels of social isolation. Significant differences were also observed in virtual community, and companionship motives. Younger participants (M=3.11, SD=0.76) were more likely to use SNSs for the upkeep of virtual communities (M=2.78, SD=0.79; t (230)=3.24, p=.001). The magnitude of the differences in means (MD=0.33, *95% CI*: 0.13 to 0.53) was small (eta^2=0.01). Younger participants (M=2.84, SD=0.94) were also more likely to use SNSs for companionship motives compared to older participants (M=2.47, SD=0.78; t (230)=3.20, p=.002). The magnitude of the differences in the means (MD=0.36, *95% CI*: 0.14 to 0.59) was relatively small (eta^2=0.04), with 4% of the variance in companionship explained by age.

Gender differences were observed in virtual community and social isolation. Men were more motivated to use SNSs for the building and upkeep of virtual communities (M=3.15, SD=0.76) compared to women, M=2.84, SD=0.79; t (230)=2.94, p=.004. The magnitude of the differences in means (MD=0.31, *95% CI*: 0.10 to 0.53) was relatively small (eta^2=0.04), meaning that 4% of the variance in virtual communities can be explained by gender. Men also reported higher levels of social isolation (M=30.51, SD=8.11) compared to women, M=26.95, SD=7.97; t (230)=3.22, p=.001 in the present study. Again, the magnitude of the differences in the means (MD=3.56, *95% CI*: 1.38 to 5.74) was relatively small (eta^2=0.04). These findings demonstrate partial support for H_4, although women reported greater social connectedness, the difference was not significant, thus H_{4a} was not supported. Differences were observed in social isolation, men reported significantly greater levels of social isolation, providing support for H_{4b}.

Educational differences were explored; education was grouped into lower (≤college) and higher (≥bachelor's degree) educational attainment. Significant differences were observed in SNS engagement and relationship maintenance. Participants with higher educational attainment were more likely to engage with SNSs (M=3.75, SD=0.59) compared to those with lower educational attainment (M=3.53, SD=0.59; t (230) = -2.66, p=.008). The magnitude of the differences in means (MD=−0.22, *95% CI*: −0.39 to −0.06) was relatively small (eta^2=0.03), 3% of the variance in SNS engagement can be explained by education. Higher educated participants were also more likely to use SNSs for relationship maintenance (M=4.18, SD=0.52) compared to those with lower educational attainment (M=3.91, SD=0.65; t (230) = -3.31, p=.001). The magnitude of the differences in the means (MD=−0.27, *95% CI*: −0.42 to −0.11) was small (eta^2=0.01).

Hierarchical regression analysis examined predictors of social connectedness (see Table 1). Age and gender were entered into Block I, SNS engagement was entered into Block II, motives for SNS use (virtual community, companionship, exhibitionism, and relationship maintenance) were entered into Block III, and social isolation was entered into Block IV. The inclusion of age and gender in Block I explained 4% of the variance in social connectedness, the addition of SNS engagement to Block II explained a further 3% of the variance in social connectedness, the inclusion of SNS engagement motives into Block III

Table 1 Regression analysis examining predictors of social connectedness

	Block I			Block II			Block III			Block IV		
	β	*SE*	*t*	*β*	*SE*	*t*	*β*	*SE*	*t*	*β*	*SE*	*t*
Age	0.17**	0.74	2.63	0.22**	0.76	3.26	0.23***	0.75	3.53	0.28***	0.70	4.48
Gender	0.08	1.75	1.22	0.07	1.74	1.06	0.07	1.72	1.07	−0.01	1.63	−0.16
SNS Engagement				0.17**	1.45	2.57	0.20**	1.55	2.84	0.15*	1.46	2.18
Virtual Community							0.15	1.36	1.81	0.10	1.27	1.22
Companionship							−0.29***	1.18	-3.61	−0.22**	1.11	-2.96
Exhibitionism							−0.07	1.07	-1.01	−0.06	1.00	−0.84
Relationship Maintenance							0.16*	1.52	2.35	0.13*	1.41	2.03
Social Isolation										−0.37***	0.10	-6.07
	$\Delta R^2 = 0.04$			$\Delta R^2 = 0.03$			$\Delta R^2 = 0.09$			$\Delta R^2 = 0.12$		
	$\Delta F = 4.18$*			$\Delta F = 6.60$**			$\Delta F = 6.15$***			$\Delta F = 36.89$***		
	df = 2, 229			*df* = 1, 228			*df* = 4, 224			*df* = 1, 223		

*$p \leq .05$, **$p \leq .01$, ***$p \leq .001$

explained an additional 9% of the variance, while the inclusion of social isolation into the final Block IV explained a further 12% of the variance. Age retained significance throughout the model and was predictive of social connectedness, meaning that older age was predictive of greater social connectedness, reiterating lack of support for H_{3a}. SNS engagement also retained significance throughout the model, suggesting that engagement with SNS's was predictive of social connectedness, providing support for H_1. Companionship and relationship maintenance motives for SNS use both retained significance through the model, being motivated for SNS use by companionship was associated with lower levels of social connectedness, while being motivated to use SNS's for relationship maintenance was predictive of social connectedness. Finally, as expected, social isolation was significantly negatively predictive of social connectedness. The total variance in social connectedness explained by the model was 28%, $F(8,223) = 10.58$, $p < .001$.

5 Discussion

The emergence of the COVID-19 pandemic has emphasised the importance of social connectedness and the impact of social isolation (Liu et al., 2022; Okabe-Miyamoto & Lyubomirsky, 2021). Recent studies have shown that the impact of stress is more pronounced when the experience is prolonged (Goldfarb, 2020). Prior to the COVID-19 outbreak, Hong Kong experienced a prolonged period of social unrest through 2019 and into early 2020, halted only by the arrival of the COVID-19 pandemic. This led to one of the longest, more rigorous and restrictive COVID-19 measures in place around the globe. The present study sought to examine the relationship between SNS engagement, social isolation and social connectedness during the COVID-19 outbreak in Hong Kong, in the immediate aftermath of the social unrest. Regression analysis revealed that SNS engagement was a significant predictor of social connectedness, providing support for H_1. SNS engagement was negatively associated with social isolation, providing support for H_2. Greater SNS engagement was observed in younger adults, confirming H_{3a}. Older not younger adults reported greater social connectedness in the present sample, meaning H_{3b} was not supported. Significantly lower levels of social isolation were observed in younger adults, providing support for H_{3c}. Gender differences were observed in social isolation; men reported significantly higher levels of social isolation compared to women (H_{4a}), however significant differences were not observed in social connectedness (H_{4b}), meaning that H_4 was partially supported.

SNS engagement was a significant predictor of social connectedness in the present study. This implies that during the early stages of the pandemic social media use enabled respondents to feel more socially connected. This finding is in line with previous research (Kovacs et al., 2021; Latikka et al., 2022; Ostic et al., 2021). SNS engagement was negatively related to social isolation, suggesting that during the pandemic engagement with social media enabled respondents to feel less socially isolated, supporting previous findings (Kovacs et al., 2021; Latikka et al., 2022; Ostic et al., 2021; Twenge & Campbell, 2019).

Age differences were observed in SNS engagement, social isolation, and social connectedness. Greater SNS engagement and lower levels of social isolation were evident among younger participants (≤35yrs). This supports previous research observing greater social media engagement among younger populations and lower levels of social isolation (Hawkley et al., 2022; Twenge & Campbell, 2019). However, this did not lead to feel-

ings of greater social connectedness among younger participants in the present study: older respondents (≥36yrs) reporting significantly greater levels of social connectedness. This echoes the findings of Cornwell et al. (2008) and is inconsistent with the assumptive negative impact of ageing on social connectedness. This could suggest that older individuals engage in more meaningful social interaction online that contributes to greater feelings of social connectedness.

Gender differences were observed in social isolation, with men reporting greater levels of social isolation. This supports previous research reporting that the larger and wider networks of women may help to reduce or buffer feelings of isolation (Kiely et al., 2021). Gender differences were identified in SNS engagement, with men engaging in SNSs less than women in the present sample, gender differences were also observed in SNS engagement motives, with men more motivated to engage with SNSs for virtual community building, supporting previous reports of men's higher utilisation of resource-based SNSs compared to women (Twenge & Martin, 2020).

Age was associated with greater levels of social connectedness in the present study. This is interesting as much of the literature associates older age with declines in social connectedness (O'Rourke et al., 2018). However, more recent examinations of the relationship between age and social connectedness remain undecided (Ang, 2019; Kiely et al., 2021). Older age was associated with being motivated to engage in SNSs for companionship in the present study, and was also associated with social isolation, supporting recent research reporting social isolation risks in older adults, particularly in the context of the COVID-19 pandemic (O'Rourke et al., 2018; Wu, 2020). SNS engagement was associated with lower levels of social isolation, implying that engagement with SNSs reduced social isolation in the present study. This aligns with previous research on the positive effects of digital media on wellbeing, where SNS has been shown to have beneficial effects on wellbeing by increasing social capital, which in turn boosts wellbeing (Valkenburg & Peter, 2011).

Hong Kong experienced one of the strictest and longest of COVID-19 restrictions, after over three years of enforced limitations and restrictions on movement and social gatherings, it cannot be expected that individuals can immediately return to 'normal' following the upheaval of the previous three years and beyond. Immediately prior to the COVID-19 pandemic, Hong Kong had already experienced major social unrest throughout 2019, which has resulted in a major burden on the mental health of the local Hong Kong population (Ni et al., 2020; Tso & Park, 2020). During the social unrest, SNSs and social media was described as battleground (Shao, 2019), whereby the population had already begun utilising SNSs in an increasing bid to keep in touch and connect during the social unrest (Lim, 2019; Parker, 2014). As such, online communication has become ever more important as a means of social connectedness. Although recent research concerning the mental health of Hong Kongers paints a disconcerting picture (Ni et al., 2020; Tso & Park, 2020), the present findings reveal that social connectedness offers hope for salvation. In the present study older age was predictive of social connectedness and associated with lower engagement on SNSs. Recent research has revealed a 16% prevalence of mental health disorders among young people in Hong Kong (Hung, 2023), with experts appealing to health authorities to address the impact of technology on young people. Findings from the present study, although small scale, align with previous findings observing that older adults who spend less time engaging on SNSs report greater levels of social connectedness (Newman et al., 2021).

5.1 Limitations & Conclusions

The present study makes a meaningful contribution to the literature examining the relationship between social media engagement, social isolation and social connectedness in a Chinese context during the COVID-19 outbreak in Hong Kong. The current findings lend support to the extant literature. However, the study is not without its limitations: firstly, the data was cross-sectional, meaning that any long-term changes in the relationship between social media engagement, social isolation and social connectedness through the emergence and evolution of COVID-19 remains unknown. Secondly, the reliance on a convenience sample limits the ability to generalize the results to a larger population. Future studies could consider a larger sample examined longitudinally to examine the long-term impacts of COVID on the relationship between social media engagement, social isolation and social connectedness. It is now more than three years since the emergence of COVID-19, while COVID-related restrictions may be over in most countries, the lingering effects of enforced and prolonged social restrictions and isolation are cumulative, necessitating more in-depth examination of the long-term effects of the COVID-19 pandemic on social connectedness and wellbeing.

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Declarations

Conflicts of interest No potential conflict of interest is reported by the authors.

References

Adams, R. E., Santo, J. B., & Bukowski, W. M. (2011). The presence of a best friend buffers the effects of negative experiences. *Developmental Psychology*, *47*, 1786–1791. https://doi.org/10.1037/a0025401.

Ang, S. (2019). Life course social connectedness: Age-cohort trends in social participation. *Advances in Life Course Research*, *39*, 13–22. https://doi.org/10.1016/j.alcr.2019.02.002.

Appel, M., Marker, C., & Gnambs, T. (2020). Are social media ruining our lives? A review of meta-analytic evidence. *Review of General Psychology*, *24*, 60–74. https://doi.org/10.1177/1089268019880891.

Bekalu, M. A., McCloud, R. F., & Viswanath, K. (2019). Associations of social media use with social well-being, positive mental health and self-rated health: Disentangling routine use from emotional connection to use. *Health Education & Behaviour*, *46*, 695–805. https://doi.org/10.1177/1090198119863768.

Berryman, C., Ferguson, C. J., & Negy, C. (2017). Social media use and mental health among young adults. *Psychiatry Quarterly*, *89*, 307–314. https://doi.org/10.1007/s11126-017-9535-6.

Cheng, C., Wang, H., Sigerson, L., & Chau, C. (2019). Do the socially rich get richer? A nuanced perspective on social network site use and online social capital accrual. *Psychological Bulletin*, *145*, 734–764. https://doi.org/10.1037/bul0000198.

Choi, D. H., & Noh, G. Y. (2019). The influence of social media use on attitude toward suicide through psychological well-being, social isolation, and social support. *Information Communication & Society*, *23*, 1–17. https://doi.org/10.1080/1369118X.2019.1574860.

Cornwell, B., Laumann, E. O., & Schumm, L. P. (2008). The social connectedness of older adults: A national profile. *American Sociological Review*, *73*, 185–203. https://doi.org/10.1177/000312240807300201.

Cowling, B. J., Ali, S. T., Ng, T. W. Y., Tsang, T. K., Li, J. C. M., Fong, M. W., & Leung, G. M. (2020). Impact assessment of non-pharmaceutical interventions against coronavirus disease 2019 and influenza in Hong Kong: An observational study. *Lancet Public Health*, *5*, 279–288. https://doi.org/10.1016/S248-2667(20)30090-6.

Dienlin, T., Masur, P. K., & Trepte, S. (2017). Reinforcement or displacement? The reciprocity of FTF, IM, and SNS communication and their effects on loneliness and life satisfaction. *Journal of Computer-Mediated Communication*, *22*, 71–87. https://doi.org/10.1111/jcc4.12183.

Dixon, A. (2021). The United Nations Decade of Healthy Ageing requires concerted global action. *Nature Ageing*, *1*, 2. https://doi.org/10.1038/s43587-020-00011-5.

Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook 'friends': Social capital and college students' use of online social network sites. *Journal of Computer-Mediated Communication*, *12*, 1143–1168. https://doi.org/10.1111/j.1083-6101.2007.00367.x.

Franke, T., Sims-Gould, J., Nettlefold, L., Ottoni, C., & McKay, H. A. (2021). It makes me feel not so alone: Features of the choose to Move physical activity intervention that reduce loneliness in older adults. *Bmc Public Health*, *21*, 312.

Goldfarb, E. V. (2020). Participant stress in the COVID-19 era and beyond. *Nature Reviews Neuroscience*, *21*, 663–664. https://doi.org/10.1038/s41583-020-00388-7.

Hawkley, L. C., Buecker, S., Kaiser, T., & Luhmann, M. (2022). Loneliness from young adulthood to old age: Explaining age differences in loneliness. *International Journal of Behavioural Development*, *46*, 39–49. https://doi.org/10.1177/0165025420971048.

Hollenbaugh, E. E., & Ferris, A. L. (2014). Facebook self-disclosure: Examining the role of traits, social cohesion and motives. *Computers in Human Behaviour*, *30*, 50–58. https://doi.org/10.1016/j.chb.2013.07.055.

Hong Kong Special Administrative Region (HKSAR) Government (2023). Coronavirus Disease (COVID-19) in HK. Retrieved from: https://www.coronavirus.gov.hk/eng/index.html.

Hung, E. (2023, May 12). More than 16 per cent of Hong Kong's young people have likely mental health issues, large scale study finds. *South China Morning Post* Retrieved from: https://www.scmp.com.

Hussenoeder, F. S. (2022). The bright side of social network sites: On the potential of online social capital for mental health. *Digital Health*, *8*, 1–9. https://doi.org/10.1177/20552076221093133.

Jarman, H. K., Marques, M. D., McLean, S. A., Slater, A., & Paxton, S. J. (2021). Motivations for social media use: Associations with social media engagement and body satisfaction, and well-being among adolescents. *Journal of Youth & Adolescence*, *50*, 2279–2293. https://doi.org/10.1007/s10964-020-013390-z.

Kemp, S. (2023). Digital 2023: Global overview report. Retrieved from: https://datareportal.com/.

Kiely, K. M., Sutherland, G., Butterworth, P., & Reavley, N. J. (2021). Age and gender differences in the reciprocal relationship between social connectedness and mental health. *Social Psychiatry & Psychiatric Epidemiology*, *56*, 1069–1081. https://doi.org/10.1007/s00127-020-01960-3.

Kovacs, B., Caplan, N., Grob, S., & King, M. (2021). Social networks and loneliness during the COVID-19 pandemic. *Socius*, *7*. https://doi.org/10.1177/237802312098524.

Lai, E. T. C., Ho, S. C., & Woo, J. (2023). Social isolation, socioeconomic status, and development of functional impairments in Chinese older adults aged 70 years and over: A cohort study. *Aging Clinical & Experimental Research*, *35*, 155–165. https://doi.org/10.1007/s40520-022-02259-w.

Latikka, R., Koivula, A., Oksa, R., Savela, N., & Okasen, A. (2022). Loneliness and psychological distress before and during the COVID-19 pandemic: Relationships with social media identity bubbles. *Social Science & Medicine*, *293*, 114674. https://doi.org/10.1016/j.sociscimed.2021.114674.

Lee, R. M., Draper, M., & Lee, S. (2001). Social connectedness, dysfunctional interpersonal behaviours and psychological distress: Testing a mediator model. *Journal of Counselling Psychology*, *48*, 310–318. https://doi.org/10.1037/0022-0167.48.3.310.

Lim, L. (2019, August 30). Do you speak Kongish? Hong Kong protestors harness unique language code to empower and communicate. *South China Morning Post* Retrieved from: https://www.scmp.com/magazines/post-magazine/short-reads/article/3024863/do-you-speak-kongish-hong-kong-protesters.

Lin, L. Y., Sidani, J. E., Shensa, A., Radovic, A., Miller, E., Colditz, J. B., & Primack, B. (2016). Association between social media use and depression among US young adults. *Depression & Anxiety*, *33*, 323–331. https://doi.org/10.1002/da.22466.

Liu, S. R., Davis, E. P., Palma, A. M., Sandman, C. A., & Glynn, L. M. (2022). The acute and persisting impact of COVID-19 on trajectories of adolescent depression: Sex differences and social connectedness. *Journal of Affective Disorders*, *299*, 246–255. https://doi.org/10.1016/j.ad.2021.11.030.

Lubben, J. E., Gironda, M. W., & Lee, A. (2002). Refinements to the Lubben Social Network Scale: The LSNS-R. *Behavioural Measurement Letter*, *7*, 2–11.

Marino, C. (2018). Quality of social media use may matter more than frequency of use for adolescents' depression. *Clinical Psychological Science*, *6*, 455. https://doi.org/10.1177/2167702618771979.

Nakagomi, A., Shiba, K., Kondo, K., & Kawachi, I. (2022). Can online communication prevent depression among older people? A longitudinal analysis. *Journal of Applied Gerontology*, *41*, 167–175. https://doi.org/10.1177/0733464820982147.

Newman, L., Stoner, C., & Spector, A. (2021). Social networking sites and the experience of older adult users: A systematic review. *Ageing & Society*, *41*, 377–402. https://doi.org/10.1017/S0144686X19001144.

Ng, T. K., Rochelle, T. L., Shardlow, S. M., & Ng, S. H. (2014). A transnational bicultural place model of cultural selves and psychological citizenship: The case of Chinese immigrants in Britain. *Journal of Environmental Psychology*, *40*, 440–450. https://doi.org/10.1016/j.envp.2014.10.005.

Ni, M. Y., Yao, X. I., Leung, K. S. M., Yau, C., Leung, C. M. C., Lun, P., & Leung, G. M. (2020). Depression and post-traumatic stress during major social unrest in Hong Kong: A 10-year prospective cohort study. *The Lancet*, *395*, 273–284. https://doi.org/10.1016/S0140-6736(19)33160-5.

O'Rourke, H. M., Collins, L., & Sidani, S. (2018). Interventions to address social connectedness and loneliness for older adults: A scoping review. *BMC Geriatrics*, *18*, 214. https://doi.org/10.1186/s12877-018-0897-x.

Okabe-Miyamoto, K., & Lyubomirsky, S. (2021). Social connection and wellbeing during COVID-19. *World Happiness Report*, Chap. 6. Retrieved from: https://worldhappiness.report/ed/2021/social-connection-and-well-being-during-covid-19/.

Okabe-Miyamoto, K., Folk, D., Lyubomirsky, S., & Dunn, E. W. (2021). Changes in connection during COVID-19 social distancing: It's not (household) size that matters, it's who you're with. *Plos One*, *16*, e0245009. https://doi.org/10.1371/journal.pone.0245009.

Oosga (2024). Social media in Hong Kong: 2023 stats and platform trends. Retrieved from: https://oosga.com/social-media/hkg/.

Ortiz-Ospinosa, E. (2019). The rise of social media. Retrieved from: https://ourworldindata.org/rise-of-social-media.

Ostic, D., Qalati, S. A., Barbosa, B., Shah, S. M. M., Vela, E. G., Herzallah, A. M., & Liu, F. (2021). Effects of social media use on psychological well-being: A mediated model. *Frontiers in Psychology*, *12*, 678766. https://doi.org/10.3389/fpsyg.2021.678766.

Parker, E. (2014, October 1). Social media and the Hong Kong protests. *The New Yorker*. Retrieved from: https://www.newyorker.com.

Rochelle, T. L. (2023). Social participation, loneliness and well-being among older adults in Hong Kong: A longitudinal examination. *Psychology Health & Medicine*, *28*, 2927–2937. https://doi.org/10.1080/13548506.2022.2058028.

Rosenfeld, M. J., Thomas, R. J., & Hausen, S. (2019). Disintermediating your friends: How online dating in the United States displaces other ways of meeting. *Proceedings of the National Academy of Sciences*, *116*, 31431531. https://doi.org/10.1073/pnas.1908630116.

Schemer, C., Masur, P. K., Geiss, S., Müller, P., & Schäfer, S. (2021). The impact of internet and social media use on well-being: A longitudinal analysis of adolescents across nine years. *Journal of Computer-Mediated Communication*, *26*, 1–21. https://doi.org/10.1093/jcmc/zmaa014.

Scherr, S., Toma, C. L., & Schuster, B. (2019). Depression as a predictor of Facebook surveillance and envy. *Journal of Media Psychology*, *31*, 196–202. https://doi.org/10.1027/1864-1105/a000247.

Shao, G. (2019, August 15). Social media has become a battleground in Hong Kong's protests. Retrieved from: https://www.cnbc.com/2019/08/16/social-media-has-become-a-battleground-in-hong-kongs-protests.html.

Statista (2024). Social media in Hong Kong: Statistics and facts. Retrieved from: https://www.statista.com.

Statista (2023a). Most popular social networks worldwide as of October 2023. Retrieved from: https://www.statista.com.

Statista (2023b). Gender distribution of social media audiences worldwide. Retrieved from: https://www.statista.com.

Tateno, M., Teo, A. R., Ukai, W., Kanazawa, J., Katsuki, R., Kubo, H., & Kato, T. A. (2019). Internet addiction, smartphone addiction, and hikomori trait in Japanese young adult: Social isolation and social network. *Frontiers in Psychiatry*, *10*, 455. https://doi.org/10.3389/fpsyt.2019.00455.

Tso, I. F., & Park, S. (2020). Alarming levels of psychiatric symptoms and the role of loneliness during the COVID-19 epidemic: A case study in Hong Kong. *Psychiatric Research*, *293*, 113423. https://doi.org/10.1016/j.psychres.2020.113423.

Twenge, J. M., & Campbell, W. K. (2019). Media use is linked to lower psychological well- being: Evidence from three datasets. *Psychiatric Quarterly*, *90*, 311–331. https://doi.org/10.1007/s11126-019-09630-7.

Twenge, J. M., & Martin, G. N. (2020). Gender differences in associations between digital media use and psychological well-being: Evidence from three datasets. *Journal of Adolescence*, *79*, 91–102. https://doi.org/10.1016/j.adolescence.2019.12.018.

Valkenburg, P. M., & Peter, J. (2011). Online communication among adolescents: An integrated model of its attraction, opportunities and risks. *Journal of Adolescent Health*, *48*, 121–127. https://doi.org/10.1016/j.jadohealth.2010.08.020.

Vorderer, P., Hefner, D., Reinecke, L., & Klimmt, C. (2017). *Permanently online, permanently connected: Living and communicating in a POPC world*. Routledge.

Wang, J. L., Jackson, L. A., Gaskin, J., & Wang, H. (2014). The effects of Social networking site (SNS) use on college students' friendship and well-being. *Computers in Human Behaviour*, *37*, 229–236. https://doi.org/10.1016/j.chb.2014.04.051.

Whiting, & Williams (2013). Why people use social media: A uses and gratification approach. *Qualitative Market Research: An International Journal*, *16*, 362–369. https://doi.org/10.1108/QMR-06-2013-0041.

Winstone, L., Mars, B., Haworth, C. M. A., & Kidger, J. (2021). Social media use and social connectedness among adolescents in the United Kingdom: A qualitative exploration of displacement and stimulation. *Bmc Public Health*, *21*, 1736. https://doi.org/10.1186/s12889-201-11802-9.

Wu, B. (2020). Social isolation and loneliness among older adults in the context of COVID- 19: A global challenge. *Global Health Research & Policy*, *5*, 27. https://doi.org/10.1186/s41256-020-00154-3.

Yang, C., Brown, B. B., & Braun, M. T. (2014). From Facebook to cell calls: Layers of electronic intimacy in college students' interpersonal relationships. *New Media & Society*, *16*, 5–23. https://doi.org/10.1177/14614448124724.