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The COVID-19 pandemic and international students: A mixed-methods approach to relationships between social media use, social support, and mental health

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The COVID-19 pandemic and international students:
A mixed-methods approach to relationships between
social media use, social support, and mental health
by Hyunjin Seo, Yuchen Liu, Husain Ebrahim,
Muhammad Ittefaq, and Donghwa Chung

Abstract

The COVID-19 pandemic has added significant stress to international students in the U.S. who already face myriad challenges in adjusting to their host country. We used a mixed-method approach combining survey and interview research involving international students enrolled in undergraduate or graduate programs at a U.S. university to analyze how their social media use and perceived social support and social adjustment are associated with their sense of mental well-being when taking into account demographic and social psychological characteristics. Our findings show that international students spent an increased amount of time on social media during the pandemic for both networking and information seeking purposes. Those who use social media primarily for networking purposes reported better mental health, whereas social media use for information seeking was not significantly associated with their mental health. Social support was an important predictor of international students' social media use. This study provides scholarly and policy implications for supporting international students during a public health crisis.

Contents

[Introduction](#)

[Literature review](#)

[Methods](#)

[Results](#)

[Discussion](#)

[Conclusion](#)

Introduction

Faced with cultural differences, language barriers, and financial constraints, international students enrolled in universities outside their home country tend to experience more psychological challenges than do local students (Andrade, 2006; Mori, 2000; Maleku, *et al.*, 2022; Zhang, *et al.*, 2022). The COVID-19 pandemic, which hit the world in 2019 and continued through 2022, has added significant complexity to challenges international students already face in adjusting to education and lifestyles in the host country (English, *et al.*, 2022; Harlow, 2020; Kim and Kim, 2021; Jenei, *et al.*, 2020). In the United States, many international

students were unable to travel home or had major difficulties in returning home due to COVID-19 travel restrictions and quarantine mandates for international visitors in 2020 and 2021 (Chikaonda, 2021; Harlow, 2020; Koo and Nyunt, 2022). For example, considering hardline immigration stances of the Trump administration, some students decided not to leave for their home country for fear of not being allowed to reenter the United States once the pandemic recedes. A majority of international students remained in the United States, often staying alone in the early days of the pandemic in 2020, and subsequently had limited opportunities for social interactions through early 2022 (Durrani, 2020; Koo and Nyunt, 2022; Yehudai, *et al.*, 2022). This further aggregated a sense of social isolation, which was a concern for international students even before the pandemic (Hefner and Eisenberg, 2009; Koo and Nyunt, 2022; Ye, *et al.*, 2020; Zhai and Du, 2020). Moreover, university announcements to international students during the pandemic were sometimes mixed, ambiguous, and unclear, causing them more stress (Zhou, 2020). In this context, academics and practitioners called for more attention to unique challenges facing international students (Cheng, 2020; Jenei, *et al.*, 2020).

We conducted survey and interview research with international students, who are non-native English speakers enrolled in undergraduate or graduate programs at a U.S. university, to examine how social media use and social psychological factors are associated with reported sense of mental well-being during the COVID-19 pandemic. Empirical data come from a survey of 227 international students and interviews with 25 international students (both undergraduate and graduate) at a large, public research university in the U.S. Midwest in 2020. International students account for a significant proportion of the student population at U.S. higher education institutions, with more than one million studying in the country (Institution of International Education, 2019). Specifically, we analyzed how international students' perceived social support, social adjustment, and social media use (networking vs. information seeking) are associated with mental health even when controlling for demographic (age, gender, number of years at the university) and social psychological factors (self-efficacy and collective self-esteem). Interview data provides important context to patterns identified via survey data. For the purpose of this study, social support is defined as anything that makes an individual feel "cared for" and "valued," and belong to "a network of communication and mutual obligation" [1]. Social adjustment refers to social capital that can help an individual adjust to an environment or situation (Corradi and Levrau, 2021).

The COVID-19 pandemic provides an important opportunity to understand how international students navigate the public health crisis which took "a harsh toll" on young adults' well-being (Kim and Kim, 2021; Mumphrey and Kelleher, 2020). By using a mixed-methods approach, we offer a comprehensive and in-depth look at international students' perspectives and experiences during the pandemic. While the study focuses on COVID-19, implications of this research go well beyond the current public health crisis. In particular, findings from this study concerning combined effects of demographic and social psychological characteristics, social support, social adjustment, and social media use behavior on international students' mental health challenges emphasize the importance of developing holistic understandings of international students' social, cultural, and technological contexts. As international students are more likely to experience heightened levels of anxiety and depression as compared with local students (Koo and Nyunt, 2022), it is essential to devise evidence-based support programs for international students (Institution of International Education, 2019). Empirical research findings from our study contribute to assisting higher education administrators and policymakers in developing empirically informed strategies related both to communication and to provision of relevant support.

Literature review

International students' mental health during COVID-19

Transitioning to university life is considered one of the most challenging experiences that young adults go through (Feldt, *et al.*, 2011; Thomas, *et al.*, 2020). For most young adults, this is the period when they

experience living outside their parental household for the first time. New responsibilities and increased workload as well as changes in social circles and sleeping/eating habits can be major sources of stress for university students (Seo, *et al.*, 2016; Zhang, *et al.*, 2022). International students enrolled in higher education institutions have additional potential sources of stress including language proficiency issues, new societal and cultural norms, academic differences, and financial burdens (Lin, *et al.*, 2012; Park, *et al.*, 2014; Seo, *et al.*, 2016; Sherry, *et al.*, 2010). Previous research (Hefner and Eisenberg, 2009; Maleku, *et al.*, 2022) suggested that students with characteristics that differ from most other students (*e.g.*, international students and ethnic minority groups) are under greater risk of social isolation. International students often report feeling lonely due to lack of strong social connections in their new environment and unfamiliar cultural and societal environments (Maleku, *et al.*, 2022; Sherry, *et al.*, 2010; Zhang, *et al.*, 2022). Faced with these issues, international students often experience more psychological challenges than do local students (Andrade, 2006; Mori, 2000; Seo, *et al.*, 2016).

The COVID-19 pandemic has escalated the level of fear and anxiety among university students (Yehudai, *et al.*, 2022). Students reported feeling “depressed” and having some other health issues such as “chest pain, shortness of breath, and sleeping problems” during the pandemic [2]. Even before the pandemic, one out of five international students reported experiencing mental health problems (Auerbach, *et al.*, 2018). Concerns about their health, education, immigration status, and job prospects during the pandemic have caused enhanced levels of stress among international students (Zhai and Du, 2020). The Trump administration’s moves to tighten access to the H-1B work visa program for high-skilled workers alarmed international students seeking to gain employment in the United States after graduation (Kanno-Youngs and Jordan, 2020). In addition, international students were often ineligible for pandemic-specific government support including funds through the Coronavirus Aid, Relief, and Economic Security (CARES) Act in the United States (Murakami, 2020). For Asian students, especially students from China, exposure to racial discrimination and verbal attacks for being responsible for the spread of the virus is an important factor affecting their mental health (Chen, *et al.*, 2020). Experiencing discrimination can elevate the stress level and can lead to more mental and physical health problems (Chen, *et al.*, 2020). In this context, we examine key mental health challenges that international students report experiencing during the COVID-19 pandemic (Research question 1).

Social psychology, social support, and social adjustment

An important area to examine is the role of social support and social adjustment for international students to deal with crisis situations like the pandemic. Social support refers anything that makes an individual feel “cared for” and “valued,” and belong to “a network of communication and mutual obligation” [3]. Social adjustment is defined as social capital that can help an individual adjust to an environment or situation (Corradi and Levrau, 2021). As previous studies have shown, social support has direct and indirect effects on individuals’ perceived stress level and overall mental health (Kim, Yun, and Yoon, 2009; Li and Chen, 2014; Seo, *et al.*, 2016; Ye, 2006a, 2006b). For example, social support serves as a buffer to an individual’s stress by offering emotional and other types of support to the individual (Chang, *et al.*, 2022; Cobb, 1976; Cohen and Wills, 1985). Consequently, university students who receive more social support are less likely to experience mental health issues (Hefner and Eisenberg, 2009). In particular, a local support network is essential for students’ emotional, social, and academic adjustment to university (English, *et al.*, 2022). Individuals with family members or friends who provide psychological and material resources tend to maintain healthier and happier lives (Cohen and Syme, 1985; Seo, *et al.*, 2016). However, it is often difficult for international students to establish in-person social support systems comparable to what they had in their home country. Establishing mediated social support, provided through digital communication technologies, in their host country also takes time. This in turn may worsen the emotional well-being of international students (English, *et al.*, 2022; Hechanova-Alampay, *et al.*, 2002; Yeh and Inose, 2003). Prior research (Chang, *et al.*, 2022; English, *et al.*, 2022) has found that type or quality of social support that international students received had buffering effects when international students were undergoing psychological stress.

Previous studies suggest that individuals with certain social psychological characteristics may perceive a

higher level of social support and social adjustment and handle stressful situations better (Barker, 2009; Crocker and Luhtanen, 1990; Seo, *et al.*, 2014; Tajfel, 1981). Self-efficacy and collective self-esteem play important roles in this (Bandura, 1995; Barker, 2009; Crocker and Luhtanen, 1990; Seo, *et al.*, 2014; Tajfel, 1981). Self-efficacy refers to an individual's belief of being competent in achieving goals such as building new friendships (Zullig, *et al.*, 2011). Individuals with higher self-efficacy tend to demonstrate higher levels of social support and adjustment and more actively participate in social gatherings (Seo, *et al.*, 2016, 2014). Collective self-esteem is an individual's self-concept influenced by "the value and emotional significance" attached to their membership in a social group as well as knowledge of that membership (Barker, 2009; Crocker and Luhtanen, 1990; Seo, *et al.*, 2014; Tajfel, 1981). In this sense, collective self-esteem is related to group identification. Those with a higher level of group identification and positive collective self-esteem tend to demonstrate higher levels of social activities online and off-line and more positive self-identity (Barker, 2009; Ledbetter, *et al.*, 2011; Murray and Kennedy-Lightsey, 2013; Pelling and White, 2009). For example, a university student's sense of self or self-identity is negatively affected if the student finds it difficult to identify with the overall university community (Kaufman and Feldman, 2004). Similarly, university students lacking self-esteem are more likely to experience negative effects that accompany identity gaps (Murray and Kennedy-Lightsey, 2013). Therefore, our first hypothesis (*H1*) posits that international students' social psychological characteristics would be positively associated with their perceived social support and social adjustment even after controlling for their demographic characteristics.

Social media use, social support, and mental health

The advancement of digital communication technologies and the wide adoption of social media platforms provide international students with an opportunity to maintain relationships with friends and family in their home country while building and maintaining new social connections in the host country (Pang, 2018; Park, *et al.*, 2014). In particular, social media platforms are potential venues for international students to receive relevant social support (Seo, *et al.*, 2016). Indeed, during the COVID-19 pandemic, people around the world reported spending a lot more time on social media to stay updated with friends and family and cope with the pandemic in general (Hootsuite, 2020).

In the age of online social networking, individuals often seek social support through popular social media sites or specific online support groups (Hollenbaugh and Ferris, 2015; Li, *et al.*, 2015). Previous studies suggest that social media use is positively associated with social capital and civic and political participation (Ellison, *et al.*, 2011; Gil de Zúñiga, *et al.*, 2012; Hollenbaugh and Ferris, 2015). For example, based on a survey of 301 Facebook users, Hollenbaugh and Ferris (2015) found that individuals seek companionship via Facebook and that those who use the social media platform for relationship/networking purposes were more likely to be honest, intentional, and positive than users with different motivations. A study by Cao, *et al.* (2018) show that international students who had more frequent interactions with local people via social media tend to perceive a higher level of support from the host country, though such online contacts are not sufficient for the students to adapt to the host culture. Similarly, Lin, *et al.* (2012) found that international students in the United States interacting with their U.S. friends via Facebook more frequently were more likely to generate online bridging capital. Seo, *et al.*'s (2016) study indicated that social media use is positively associated with the perceived social adjustment but not with the perceived social support, which might be explained by the finding that international students in the study generally did not feel comfortable discussing their emotionally stressful experiences on social media. Given the findings of the previous studies, our research hypothesizes that international students' perceived social support and social adjustment are positively associated with their social media use even when controlling for their demographic and social psychological characteristics (Hypothesis 2).

In terms of mental health, Park, *et al.* (2014) found that using social media platforms popular in the host country, rather than the home country's social media platforms, is more helpful for international students in maintaining a healthy mental status. Another study [4] showed that first-year university students' social media intensity — defined as "using social media to maintain friendships and using social media for social information seeking" — was negatively associated with their loneliness. In addition, compared with those who had lived in a foreign country for a longer period of time, new arrivals reported higher perceived

support from online networking activities (Ye, 2006a). These empirical research studies indicate that using social media for relationship or networking purposes may have positive influences on international students' overall mental health (Hypothesis 3a). In addition to networking and social support, information seeking is another important aspect of social media use for international students (Seo, *et al.*, 2016). During the COVID-19 pandemic, there has been a significant increase in the use of social media among people to search for pandemic-related information (Hootsuite, 2020). One of the biggest challenges for international students is finding up-to-date and accurate information regarding traveling restrictions, immigration status, university closure, and COVID-19 treatments and preventions (Jenei, *et al.*, 2020). In addition, as misinformation related to COVID-19 was rampant on social media sites, studies have also identified negative consequences of using social media during the pandemic (González-Padilla and Tortolero-Blanco, 2020; United Nations, 2020). Given the stress associated with dealing with the pandemic, relying social media primarily for information seeking purposes during the pandemic may be negatively associated with mental health (Hypothesis 3b).

Summary of research questions and hypotheses

Research question 1: What are key mental health challenges that international students report experiencing during the COVID-19 pandemic?

Hypothesis 1: International students' social psychological characteristics are positively associated with their perceived social support and adjustment even after controlling for their demographic characteristics. Specifically, the higher the level of social self-efficacy (*H1a*) and collective self-esteem (*H1b*), the higher their levels of perceived social support and adjustment.

Hypothesis 2: International students' perceived social support and social adjustment are positively associated with their social media use for networking (*H2a*) and information seeking (*H2b*) even when controlling for their demographic and social psychological characteristics. Specifically, the higher the level of social support and adjustment, the more important social media are for networking and information seeking.

Hypothesis 3: Controlling for demographics, social psychological characteristics, and perceived social support and adjustment, international students' social media use for networking and information seeking have significant effects on their reported mental health during the COVID-19 pandemic. Specifically, social media use for networking is positively associated with their reported mental health during the COVID-19 pandemic (*H3a*), whereas social media use for information seeking is negatively associated with their mental health (*H3b*).

Methods

In spring 2020, we conducted an online survey and phone interviews with international students, who were all non-native English speakers enrolled in undergraduate or graduate programs at a large, public research university in the U.S. Midwest. Our study is designed to examine international students' mental health challenges during the COVID-19 pandemic and how they are related with perceived social support and social adjustment, social media use, and their social psychological and demographic characteristics. The mixed-method approach of combining qualitative interviews and a quantitative survey is widely used in social science and other fields for a more comprehensive analysis of a research topic (Creswell and Plano Clark, 2017; Johnson, *et al.*, 2007). Indeed, the number of mixed-methods studies used in published academic journal articles has increased significantly in the past two decades (Creswell and Plano Clark, 2017). All research protocols described below were reviewed and approved by the university's Institutional Review Board (IRB).

Sampling/recruitment

To recruit participants for the survey and interviews, we contacted the International Student Association, a student-led association for all international students at the university. In addition, we reached out to country- or region-specific student associations such as the Chinese Student Association, Saudi Student Association, and Latin American Student Union at the university. The student organizations then distributed the survey link to their members through their e-mail listserv and social media channels. No incentive was provided to study participants. All international students who (i) were not native English speakers and (ii) were enrolled in undergraduate or graduate programs at the U.S. Midwestern university at the time of data collection were eligible to participate in this study. Per university Institutional Review Board guidelines, participation in the research was voluntary and answering questions was optional.

As of spring 2020, a total of 1,896 international students from more than 100 countries were enrolled in the university. Of them, 1,027 were undergraduate students, 844 graduate students, and 25 students attending the university's English language center. The majority of the international students came from Asia and the Middle East. Specifically, students from China accounted for 34.4 percent of the international student population at the university, followed by India (11.8 percent), South Korea (4.5 percent), and Saudi Arabia (4.4 percent). This composition reflects that of overall international students in the United States (Institute of International Education, 2019). A report from the U.S. Institute of International Education (2019) shows that more than one million (1,095,299) international students were enrolled in U.S. universities as of 2019, accounting for 5.5 percent of the total U.S. higher education population. The largest proportion of international students in the United States was from China, the world's most populous country, making up for 33.7 percent of the U.S. international student population. Following China were India (18.4 percent), South Korea (4.8 percent), and South Arabia (3.4 percent).

Online survey research

We conducted an online survey of the U.S. university's international students in April 2020. Our survey questionnaire was developed based on the review of previous studies discussed in the previous section. After constructing our initial survey questionnaire, we pretested it with a sample of 20 international students attending the university and then finalized the questionnaire while taking into account the feedback from those who completed the pretest. The final survey questionnaire included a total of 32 questions in mostly closed-ended format and was created on Qualtrics, a popular online survey platform. Answering the questions was optional. Our survey questionnaire included multiple screening questions to filter out those who do not qualify for the survey. A total of 227 international students participated in the survey with the response rate of 12 percent. Specific question items related to concepts and topics measured in this study are described below.

Social support and social adjustments. To measure the level of social support international students report receiving, we asked how much support they get from their family and social connections under the two situations: (1) during an emotionally stressful situation at the university and (2) during the COVID-19 pandemic. Included in the list of potential sources of support in the survey were family in the home country, friends/colleagues in the home country, family in the United States, friends/colleagues in the United States, friends/colleagues from the home country who currently study or live in the United States, advisers/mentors/professors at the university, appropriate university offices, and the home country's embassy in the United States. An index of perceived social support was created based on the scores assigned to the items, and it was reliable based on Cronbach's alpha test ($\alpha = .85$).

In our survey, we also included questions aimed at measuring the level of international students' adaption to the United States and the university (Baker and Siryk, 1989; Gray, *et al.*, 2013; Hurtado, *et al.*, 1996). Question items under this category covered different aspects of adjustment to the United States including adjusting to academic environments and expectations, adjusting to U.S. lifestyles, communicating in English, and making friends with people in the United States. Cronbach's alpha test indicated that an index based on these multiple items was reliable ($\alpha = .86$).

Social media use. We asked multiple questions to understand international students' social media use. The first set of questions were about how frequently they use social media including Instagram, Facebook, TikTok, Twitter, Snapchat, WhatsApp, LinkedIn, and YouTube. On the list of social media platforms, we also included those popular in certain countries such as WeChat for China and KakaoTalk for South Korea.

Second, the participant was asked to rate on a five-point Likert-type scale how frequently they use social media for networking and information purposes (1: Not at all; 5: Very much). Six questions used regarding the networking purpose are: (1) *To stay connected with my family in my home country*; (2) *To stay connected with my friends/colleagues in my home country*; (3) *To stay connected with my family in the United States*; (4) *To build and maintain relationships with friends/colleagues from my home country who currently study or live in the United States*; (5) *To build and maintain relationships with U.S. friends/colleagues in the United States*; and, (6) *To build and maintain relationships with other international students or colleagues in the United States*. For each question, we provided an option for "Not applicable." Cronbach's alpha test indicated that an index based on these multiple items was reliable ($\alpha = .82$). For the information seeking aspect of social media use, we included the following six items: (1) *To get news and information about my home country*; (2) *To get news and information about the United States*; (3) *To stay informed from and connected with my home country's embassy or officials in the United States*; (4) *To seek medical information*; (5) *For information related to professional development*; and (6) *For international related to educational or academic aspects*. Cronbach's alpha test indicated that an index based on these multiple items was reliable ($\alpha = .83$).

Finally, we asked how their social media use has changed since the emergence of the COVID-19 pandemic. Specifically, participants were asked to indicate on a five-point Likert-type scale whether they are spending more time or less time on different activities on social media (e.g., reading news and updates about the United States, reading friends' updates or interacting with friends, and seeking medical information).

Social psychological variables. Our survey covered two social psychological variables that have shown to be related to social media use and perceived social support: social self-efficacy and collective self-esteem (e.g., Barker, 2009; Gangadharbatla, 2008; Seo, *et al.*, 2014; Zullig, *et al.*, 2011). To measure social self-efficacy, we used five items adapted from previous studies (Seo, *et al.*, 2014; Zullig, *et al.*, 2011). The items are (1) *How well can you express your opinions when other classmates disagree with you?*; (2) *How well can you become friends with other people your age?*; (3) *How well can you have a chat with an unfamiliar person?*; (4) *How well can you work in harmony with your classmates?*; (5) *How well can you tell other people your age that you are doing something they do not like?* Cronbach's alpha test showed that the index was reliable ($\alpha = .91$).

In measuring collective self-esteem, we used five items adjusted from previous studies (Barker, 2009; Crocker and Luhtanen, 1990; Seo, *et al.*, 2014; Tajfel, 1981). Specifically, we asked the participant to indicate a level of agreement on each of the following seven statements: (1) *I am a worthy member of the groups or organizations that I belong to*; (2) *In general, others respect the groups or organizations that I am a member of*; (3) *In general, I am glad to be a member of the groups or organizations that I belong to*; (4) *The groups or organizations I belong to are an important reflection of who I am*; and (5) *I am a cooperative participant in the groups or organizations I belong to*. Participants were asked to respond on a scale of 1 (Strongly disagree) to 5 (Strongly agree), and were also offered the "Not applicable" option. Cronbach's alpha for the index was ($\alpha = .93$).

Perceived health conditions during the pandemic and demographics. We included a set of questions aimed at assessing the participant's perceived mental and physical health status. To measure mental health status, we asked the participant (i) how they would rate their overall mental health (1: *Poor* to 5: *Excellent*); (ii) stress level amid COVID-19 (1: *A lot more stress* to 5: *A lot less stress*); (iii) anxiety level amid COVID-19 (1: *A lot more anxiety* to 5: *A lot less anxiety*); and (iv) sadness amid COVID-19 (1: *A lot more sadness* to 5: *A lot less sadness*). Cronbach's alpha for the physical health index variable was ($\alpha = .90$). In terms of physical health, we asked them to rate their overall physical health and to what extent they can carry out daily physical activities. Cronbach's alpha for the physical health index variable was ($\alpha = .91$).

Finally, the demographics section of the survey questionnaire included questions on their home country, race/ethnicity, gender, age, marital status, and whether they live with or have family members in the United States. In addition, participants were asked to indicate their major, level of study (undergraduate, Master's, Ph.D., etc.), number of years attending the U.S. university, and number of years studying in the United States.

Interview research

Interview participants were recruited through recommendations from the international student organizations at the university as well as personal contacts of research team members. Through this convenience sampling approach, a total of 25 international students participated in the interview research in spring 2020. A semi-structured interview method was used to understand international students' mental health challenges, social media use, and social support during the COVID-19 pandemic. Each interview was conducted by a research team member who earned the university's IRB human subject research certificate. Specifically, the open-ended interview questionnaire covered primary sources of stress during the pandemic and ways of handling the stress or other mental health challenges. In addition, the interviewees were asked about any changes in their social media use during the pandemic, sources of information related to COVID-19, from whom they seek and gain support during the stay-at-home order. Each interview was recorded with the consent from the study participant and transcribed for data analysis. Based on grounded theory (Glaser and Strauss, 1967; Hesse-Biber and Leavy, 2010; Rubin and Rubin, 2011; Strauss and Corbin, 1994), we developed codes using a constant comparison technique. Specifically, using this inductive approach, we identified patterns in the transcripts related to themes of pandemic-related stress, social media use, and social support as well as new and emergent themes. For the reliability of interview data analysis, two independent coders, who are communication researchers, coded the same subset of the interview data (10 percent of the entire data) on identified themes. Their percent agreement was 89 percent, suggesting reliability of the analysis (Cheung and Tai, 2021; Kurasaki, 2000).

Results

The following results are based on survey responses from 227 international students and interviews with 25 international students who were enrolled in the U.S. university at the time of the data collection in spring 2020. The number of study participants represents about 13.3 percent of the total number of the students (1,896) enrolled at the university during the academic semester. As described below, the composition of the study participants in terms of level of study, nationality, age, and gender was comparable to that of the university's entire international student body (the study population from which the sample was drawn).

Demographics of study participants

Survey participants. [Table 1](#) shows key demographic characteristics of the survey participants. About 57.3 percent of the participants were students from Asia. Specifically, about 30.8 percent of the respondents were from East Asia including China, South Korea, and Japan, whereas 26.4 percent were from South or Southeast Asia including India and Singapore. A total of 29.5 percent students reported coming from the MENA (Middle East and North Africa) region, primarily from Kuwait and Saudi Arabia. In addition, about 6.2 percent of the participants came from South or Central America such as Brazil or Bolivia. This pattern is similar to the composition of the study population. In 2020, about 60 percent of international students at the university were from Asia — mostly from China (34.3 percent), followed by India (11.9 percent), and South Korea (4.6 percent). MENA is the second most significant region from which international students are from with Saudi Arabia and Kuwait leading the group.

Table 1. Characteristics of Survey Respondents

<i>Variable</i>	<i>Value</i>	<i>Count</i>	<i>Percent</i>
Gender	Male	117	51.5%
	Female	106	46.8%
	Non-binary	1	.4%
	Prefer not to answer	3	1.3%
	Total	227	100%
Level of Study	Undergraduate	101	44.5%
	Master's	39	17.2%
	Ph.D.	79	34.8%
	English-language course	8	3.5%
	Total	227	100%
Age	18-20 years old	41	18.1%
	21-24 years old	69	30.4%
	25-28 years old	52	22.9%
	29-32 years old	39	17.2%
	33 years or older	26	11.4%
	Total	227	100%
Region	Asia (East Asia)	70	30.8%
	Middle East or North Africa	67	29.5%
	Asia (South or Southeast Asia)	60	26.4%
	South or Central America	14	6.2%
	Europe	5	2.2%
	Other	11	4.9%
	Total	227	100%

About 44.5 percent were enrolled in undergraduate programs, 17.2 percent in Master's programs, and 34.8 percent in Ph.D. programs at the university. In addition, 3.5 percent of the respondents were non-degree seeking students taking English-language courses at the university's English language center. This is consistent with the study level composition of the university's international student body, as described in the [Methods](#) section. A slightly higher proportion of male students (51.5 percent) participated in the survey. About 46.8 percent chose "female"; 1.3 percent "prefer not to answer"; and 0.4 percent chose "non-binary"

of the survey options. In terms of age, about 18.1 percent of the respondents were ages 18–20; 30.4 percent ages 21–24; 22.9 percent ages 25–28; and 17.2 percent ages 29–32. About 39.5 percent of the survey participants reported attending the university less than two years, with 37.2 percent between two years and less than four years and 19.8 percent between four years and less than six years.

Interview participants. Of the 25 participants in the interview research, 12 were from Asia, 10 were from the Middle East and North African (MENA) region, and three were from South or Central America. In terms of specific countries of the Asian region, six students were from China, four from South Korea, and two from India. For the MENA region, we had five students from Saudi Arabia, four students from Kuwait, and one student from Egypt. In addition, the interview research included two students from Brazil and one student from Bolivia. In terms of level of study, 12 students were undergraduate students, nine doctoral students, and four Master’s students. Finally, 13 interviewees identified themselves as men and 12 women.

COVID-19 challenges for international students (RQ1)

When asked about living arrangements after classes moved online in March 2020 due to the COVID-19 pandemic, 35.9 percent of the survey respondents said they were staying alone. About 27.7 percent said they were staying with family, 22.3 percent with friends, and 8.7 percent with someone in a romantic relationship (but not family). In terms of where they were staying during the pandemic, the majority of the international students said they were residing within the state where the university is located (84.8 percent). Half of these respondents identified the state as their permanent residence (42.4 percent) and the other half as their temporary residence. About 5.4 percent of the students reported staying in their permanent residence outside the United States with 3.8 percent staying in their temporary residence outside the United States. With regard to their overall mental and physical health during the pandemic, the respondents rated their physical health ($M = 3.58$, $SD = .91$, on a scale of 1: *Poor* to 5: *Excellent*) slightly higher than their mental health ($M = 3.24$, $SD = 1.15$). Similarly, students reported increased level of stress during the pandemic ($M = 3.67$, $SD = .96$, on a scale of 1: *A lot less stress* to 5: *A lot more stress*). Overall, the majority of the students reported that they were able to carry about their everyday activities during the pandemic ($M = 3.74$, $SD = 1.18$, on a scale of 1: *Not at all* to 5: *Completely*).

Our interview data provide additional insights into challenges facing international students during the pandemic. Most of all, students reported feeling enhanced anxiety due to uncertainties surrounding academic, travel, and job situations as well as racial harassments experienced during the period. For example, a graduate student noted that while he had had anxiety issues for several years, the COVID-19 situation made it worse. He said: “Well, I do have anxiety issues ... I’ve been having anxiety issues for a number of years. But for this period of time, the reason why I got so anxious is because of little things, for example, assignments and stuff ...” Referring to travel restrictions and visa issues, he said he was concerned about whether he can travel to his home country and even if he could, whether he could reenter the United States considering the Trump administration’s hardline immigration policy. “The questions that nobody can answer,” he added. An undergraduate student mentioned feeling anxious about not knowing whether and when she can safely travel to her home country and also about her job prospects after graduation. “My plan was to try to find a job in the United States, but I don’t know how the job market will be affected by the pandemic and whether I can maintain my immigration status after graduation,” she said.

Our interviews show that for Asian students, harassment and racial slurs during the pandemic were sources of enhanced anxiety. A student from China said “random” people yelled at her both on and off campus accusing her of bringing Coronavirus to the United States. She said: “Some random guy in a running vehicle shouted at me, ‘Coronavirus, [expletive]’ ... it really influenced me, like it doubled, tripled my anxiety. I think it really took me a long time to overcome the emotional turbulence. When you see a vehicle is coming towards you, you will feel threatened.” Another student from South Korea mentioned someone who mistook him for a Chinese national stared at him at a grocery store and shouted, “China let you leave the country so that you spread the virus here? Go back to your country.”

Students reported that this enhanced level of anxiety affected their academic performances and sometimes

daily activities. Many relied on their peers and family members for social support during the pandemic while others received support from university offices such as international student services or student health center. “I would say for academic struggle and anxiety, I would turn to my peers, other Ph.D. students, because these things resonate with them and they know what I’m talking about and understand my anxiety,” one participant said. Another student mentioned that he learned to seek professional support for mental health challenges and that’s what he did during the pandemic. “If you have emotional problems, you have to speak out because it’s very common,” he said. He added that, like many international students, he believed in a “rumor” that seeking medical help will make you “go broke.” He added: “I didn’t see any doctors for four years because I was immersed in the freaking rumor and every time I had issues I just dealt with it myself. And I feel that I was so stupid because my insurance covers pretty much everything. So you have to know this kind of information.”

Social psychology, social support, social adjustment, and social media (H1 and H2)

The results of the hypothesis testing are shown in [Table 2](#). Our Hypothesis 1 posited international students’ social psychological characteristics would be positively associated with their perceived social support and adjustment even after controlling for their demographic characteristics. Specifically, we predicted that the higher the level of social self-efficacy (*H1a*) and collective self-esteem (*H1b*), the higher their levels of perceived social support and adjustment. Demographic variables controlled for this analysis are gender, age, and number of years spent at the university.

Table 2. Results of Multiple Regression Analyses

Dependent variable	Independent variable	β	t	R^2	ΔR^2	F
Social support (H1a)	Social self-efficacy	.25**	3.13	.18	.15	7.03***
	Self-esteem	.22**	2.75			
Adjustment (H1b)	Social self-efficacy	.43***	5.81	.32	.30	14.90***
	Self-esteem	.16*	2.12			
SM Networking (H2a)	Social self-efficacy	.09	.956	.09	.05	2.12*
	Self-esteem	.01	.11			
	Social support	.17*	1.98			
	Adjustment	-.05	-.48			
SM Information (H2b)	Social self-efficacy	-.04	-.39	.09	.04	2.08*
	Self-esteem	.07	.77			
	Social support	.25**	2.95			
	Adjustment	-.04	-.43			
Mental Health (H3)	Social self-efficacy	.29*	3.15	.20	.15	4.22***
	Self-esteem	.05	.56			
	Social support	.08	.91			
	Adjustment	.06	.71			
	SM networking (H3a)	.17*	2.10			
	SM information (H3b)	-.01	-.16			

Note. Age, gender, and the number of years spent at the U.S. university were controlled for in all analyses. * $p < .05$, ** $p < .01$, *** $p < .001$.

Both *H1a* and *H1b* were supported. First, our results show that self-efficacy and collective self-esteem are

significant predictors of perceived social support ($\Delta R^2 = .15, F = 7.03, p < .001$). Specifically, those with higher levels of self-efficacy ($\beta = .25, t = 3.13, p < .01$) and collective self-esteem ($\beta = .22, t = 2.75, p < .01$) were more likely to report the higher level of perceived social support. In addition, these social psychological characteristics showed significant associations with perceived social adjustment ($\Delta R^2 = .30, F = 14.90, p < .001$). As predicted in *H1b*, the higher the levels of self-efficacy ($\beta = .43, t = 5.81, p < .001$) and collective self-esteem ($\beta = .16, t = 2.12, p < .05$), the higher the level of perceived social adjustment.

Hypothesis 2 dealt with effects of international students' perceived social support and social adjustment on their social media use for networking (*H2a*) and information seeking (*H2b*) even when controlling for their demographic and social psychological characteristics. Specifically, we hypothesized the higher the level of social support and adjustment, the more important social media would be for networking and information seeking. Our regression analysis found support for *H2a* and *H2b*. The social psychological characteristics had significant effects on social media use for networking ($\Delta R^2 = .05, F = 2.12, p < .05$) and for information seeking ($\Delta R^2 = .04, F = 2.08, p < .05$). Those with higher levels of perceived social support were more likely to report that social media was important for their networking ($\beta = .17, t = 1.98, p < .05$) and information seeking ($\beta = .25, t = 2.95, p < .01$). However, perceived social adjustment was not significantly associated with social media use.

Our interview data provide additional perspectives on these topics. Those who see themselves as part of a social group on social media were more likely to feel supported by their connections and interact with them on social media. One participant mentioned: "I have to check on what's going on ... you know with my friends and all that. I am part of the social circle so it is important to know what other people are doing." Another student said: "During this pandemic, everybody is overwhelmed and stressed out. Social media is a channel for mutual support. Like you say, oh this course is overwhelming, this course takes too long, I cannot stand these online courses ... so something, like small talks ... dialogue ... everybody is in this together."

Overall, these students noted that they spent more time updating their friends and family about what they were going through during the pandemic and also keeping "an eye on what's happening" to their friends and family. In particular, those who do not have family members in the United States said social media has been essential for them to stay connected with their family members during the pandemic. An undergraduate student from Saudi Arabia said: "Everyday I check with my family in my home country how they are doing and also tell them how I am doing and feeling and get some advice from them." A graduate student from China said she communicates with her parents via a messaging app on a regular basis on "general life struggle," though she does not discuss academic matters with them.

Social media use and mental health (H3)

Our survey results show that YouTube is the most frequently used social media site among the respondents ($M = 5.26, SD = 1.16$, on a scale of 1: *Never* to 6: *Everyday*). It was followed by Instagram ($M = 4.57, SD = 1.85$), WhatsApp ($M = 4.33, SD = 2.17$), Facebook ($M = 3.64, SD = 1.97$), and Twitter ($M = 3.32, SD = 1.88$). When asked about reasons for using social media, participants indicated that staying connected with their family in the home country was the most important ($M = 4.70, SD = .755$, on a scale of 1: *Not important at all* to 5: *Very important*). The next important reasons were to stay connected with friends/colleagues in the home country ($M = 4.43, SD = .811$), to get news and information about the home country ($M = 4.32, SD = 1.01$), for fun ($M = 4.04, SD = 1.16$), and to build/maintain relationships with friends/colleagues from the home country who study/live in the United States.

Our survey asked students to indicate how their social media use has changed amid the pandemic. Students reported spending more time on reading news and updates about their home country on social media ($M = 3.90, SD = .82$, on a scale of 1–5), reading news and updates about the United States ($M = 3.86, SD = 1.02$), and checking family members' updates or interacting with family members on social media ($M = 3.84, SD = .90$). The results indicate that they also visited social media sites more frequently to pass time ($M = 3.77, SD = 1.16$), seek medical information ($M = 3.61, SD = .87$), and reading updates from their home country's

embassy in the United States ($M = 3.44$, $SD = 1.02$).

Hypothesis 3 posited that international students' social media use for networking and information purposes would have significant effects on their mental health during the pandemic, even when controlling for demographics, social psychological characteristics, and perceived social support and adjustment. Specifically, we predicted social media use for networking would be positively associated with their reported mental health during the COVID-19 pandemic ($H3a$) and social media use for information seeking would be negatively associated with their mental health ($H3b$). We found statistically significant effects of social media use on the students' reported mental health ($\Delta R^2 = .15$, $F = 4.22$, $p < .001$). Specifically, the more frequently they use social media for their networking purposes, the more likely they were to report better mental health ($\beta = .17$, $t = 2.10$, $p < .05$). Therefore, $H3a$ was supported. However, there was no statistically significant negative relationship between social media use for information seeking and mental health. While previous research showed that "excessive" social media consumption or reviewing social media content aimlessly (e.g., checking Facebook, Twitter, and Instagram with no specific purpose) during the COVID-19 pandemic worsened mental health outcomes (Haddad, *et al.*, 2021), it may not be the case when people use social media for specific information seeking. In our survey, questions related to information seeking included the following: *getting news and information about my home country*, *seeking medical information*, *getting news and information about the United States*, and *staying informed from my home country's embassy or officials in the United States*. However, as discussed below, some of our interview participants mentioned getting stressed reading about COVID-19 information. It is also important to note that social self-efficacy was a significant predictor of reported mental health. Those with higher levels of self-efficacy reported better mental health during the pandemic ($\beta = .29$, $t = 3.15$, $p < .05$).

Our interview participants discussed how isolation and uncertainty during the pandemic made him spend more time on social media, and how using social media to stay connected with their friends and families provided comfort. A student commented: "I would say that the biggest change in terms of my social media use is the intensity of it. Right now, I spend about twice as much time as I used to." Expressing frustrations with being isolated due to the pandemic, the student noted: "... really want to know what's going on because quarantine got yourself at home ... and the only way I can get anything fresh, you know, more fresher than air in my room is through social media."

Students also mentioned they spent more time looking for pandemic-related information and often that was stressful. A student from Kuwait said: "At the beginning of the COVID-19 pandemic, I was using social media to reads news about it all the time, but then I felt that was affecting me in a wrong way." The student explained that he was stressed that this pandemic has spread very fast around the world and thus try to reduce time spent on reading news on social media. "While I am really worried about my family back home, recently I am trying not to use social media to search anything about this COVID-19. I only watch TV to get all the recent updates about this pandemic, and that is happing every other day." A Chinese student discussed avoiding "sad news" related to the pandemic on social media. "I'm afraid of reading the sad news. It's sad to learn about the [COVID-19] statistics. I think I prefer to read some happier news. I don't like to read stories about Wuhan, China."

Several interview participants mentioned it was stressful to try to assess the quality of Coronavirus-related information on social media. An interviewee said: "Because at this period of time, I cannot really trust a lot of people. I mean, there's misinformation spreading around social media ... like crazy ... more than ever ... They are all contradictory to one another." The student said when it comes to pandemic-related information, he relied on governmental Web sites. Other students noted that while they are aware of "fake news circulating on social media," they still spend a significant amount time on social media as it is an important way for them to get informed and updated.

Discussion

Based on a survey and interviews with international students enrolled at a large public university in the U.S. Midwest, our study examined challenges international students experienced during the COVID-19 pandemic and how their social media use was associated with mental health along with social psychology, social support, and social adjustment. The outbreak of COVID-19 has caused more concerns among international students who already face a variety of challenges in adjusting to education and lifestyles in their host country (Harlow, 2020; Jenei, *et al.*, 2020; Ye, *et al.*, 2020; Zhai and Du, 2020). The study is particularly important and relevant, as international students account for a significant proportion of the study population at universities in the United States (a total of 1,095,299 international students), a home to the world's largest international student population (Institution of International Education, 2019; Project Atlas, 2019). In addition, social media platforms are important communication channels for international students to build new relationships in the host country and stay connected with those in the home country.

Scholarly implications. Overall, our results indicate that international students were spending a lot more time on social media during the pandemic — both for social networking and information seeking purposes. Specifically, they reported consuming a significant amount of time on reading news and updates about their home country and the United States as well as checking updates from family members and friends and interacting with them on social media. This is in line with reports showing people around the world spend more time online, especially on social media platforms, during the public health crisis (Hootsuite, 2020).

A significant finding from our research related to social media use is that international students who use social media primarily for social networking purposes reported better mental well-being during the pandemic. In contrast, while no statistically significant relationship was found between social media use for information seeking and reported mental health. As previous studies have shown, using social media to maintain friendships can help university students cope with loneliness (Thomas, *et al.*, 2020). Using social media to stay connected with friends and family is particularly relevant for international students who are often away from their family and friends (Seo, *et al.*, 2016). Social media serves as an important communication channel for them to be in touch with family and friends in their home country. In fact, our research shows that staying connected with their family in the home country was the most important reason for them to use social media, followed by staying connected with friends in the home country, getting news and information about the home country, for fun, and building relationships with friends from the home country who study in the United States.

It is important to note that social support was a significant predictor of social media use even when demographic and social psychological variables are controlled for. Specifically, international students who perceive higher levels of social support were more likely to use social media for both networking and information purposes. Our interviews with international students provide some context. Several students mentioned that their social groups or “friend circles” are on social media so they want to check Instagram, Facebook or other relevant sites frequently. One student mentioned: “I want to know what’s going on to them, and that’s very important ... I am part of them ... Otherwise, I feel isolated and lost.” Students indicated that the relationships built through in-person classes or cohort meetings in the United States often turn into social media friendships. In addition, their friends in the home country are connected via social media. These indicate that expectation of social support is an important condition for international students to engage in social media activities. Though most previous studies focused on how social media use may result in social support (Hollenbaugh and Ferris, 2015; Li, *et al.*, 2015), our research suggests that examining the reversed relationship is also important.

Both self-efficacy and collective self-esteem were statistically significant predictors of perceived social support and social adjustment, but only self-efficacy remained significant in predicting reported mental health when analyzed with other variables examined in the study. Self-efficacy is about an individual’s competence in the ability to succeed in a particular situation (Bandura, 1995; Seo, *et al.*, 2014), whereas collective self-esteem is about attachment to membership in a social group (Barker, 2009). Both social psychological characteristics play an important role in an individual’s relationship building and adjustments to new environments. In that sense, it seems intuitive that both factors significantly predict how much

international students feel supported and adjusted to their academic and personal life in the host country. It is important to note the significant role of self-efficacy in international students' reported mental health conditions during the pandemic, even when considering all the other factors analyzed in this study. According to Bandura (1995), self-efficacy can contribute to an individual's sense of well-being by helping them remain positive and confident in their ability to handle challenges. As discussed earlier, the COVID-19 pandemic has brought many unexpected challenges to international students. In that sense, helping international students build self-efficacy, along with providing relevant support, might be an important aspect to enhance mental health and well-being of international students.

Practical and policy implications. Results of this research offer several practical and policy implications. First, our findings show that international students who use social media for networking purposes report better mental health during the COVID-19 pandemic. While excessive social media use may be harmful to international students' mental health (Haddad, *et al.*, 2021), a more purposeful use in moderation appears to increase international students' sense of belonging and reduce the sense of social isolation. In this sense, university programs facilitating affinity group networking, both online and offline, could contribute to both mental health and professional developments among international students. Opportunities to build relationships with local communities outside the university would also be useful. In addition, workshop sessions on healthy use of social media could be incorporated into international student orientation sessions.


Second, given our findings that international students' levels of self-efficacy and collective self-esteem are significantly associated with their perceived social support and social adjustment, university programming designed to enhance international students' self-efficacy and collective self-esteem might be useful. A peer mentor program aimed at helping international students set achievable goals and gain new experiences may prove helpful in strengthening self-efficacy. With regard to collective self-esteem, events that allow international students to celebrate their cultural and ethnic heritage or programs supporting them to gain skills in handling hateful comments or biases against racial or ethnic groups would be useful.

Finally, it is important to develop a holistic view of international students. Our research shows that various aspects including demographics, social psychological characteristics, and social media use influence international students' perceptions of social support and social adjustment as well as mental health. International students come with diverse identities and lived experiences. University officials should make efforts to demonstrate their sincere commitment to understanding and valuing international students' perspectives, skills, and experiences and work with them to challenge existing practices that marginalize international students.

Limitations and future research. As with any social science research, this study has some limitations. To control for any extraneous variables such as factors associated with types of universities and cities or states where universities are located, we chose to study international students only in one university. Therefore, the findings cannot be generalized to a larger international student population in the United States, though demographics of the study participants are representative of those of the international student body of the U.S. university under study. Future studies with a large national representative sample will be able to produce more generalizable findings.

Conclusion

Social media and emerging technologies have become increasingly important in university students' academic and personal lives. For international students, these technologies are important means of staying connected with their family and friends in their home country, establishing new relationships in the host country, and gaining news and information about both home and host countries. As our research shows, the reported significance of social media for international students has heightened during the COVID-19 pandemic. As international students rely more and more on digital communication technologies, it is

important to better understand how their social media use and how it might be related to social support and mental health, among others. Based on a mixed-methods approach, our research provides theoretical and methodological guidance to future studies on this and other related topics. Moreover, relevant policy-making and higher education institutions could refer to our findings as they devise ways to better support the academic success and well-being of international students during a public health crisis and beyond. 

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Notes

[1](#) Cobb, 1976, p. 300; Thoits, 1995.

[2](#) Yehudai, *et al.*, 2022, p. 6.

[3](#) Cobb, 1976, p. 300; Thoits, 1995.

[4](#) Thomas, *et al.*, 2020, p. 146.

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The COVID-19 pandemic and international students: A mixed-methods approach to relationships between social media use, social support, and mental health

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