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Assessment of COVID-19 Knowledge Among University Students: Implications for Future Risk Communication Strategies

Amy Chesser, PhD, MA[1], Amy Drassen Ham, PhD, MA, MPH[1], and Nikki Keene Woods, PhD, MPH, MA, CPH[1]

Abstract

The purpose of this study was to describe population knowledge and beliefs about COVID-19 and current social media coverage to address a gap in what is known about risk communication during health crises. A survey with 27 questions was developed. Twenty-three percent (N = 1,136) of respondents started the survey. Less than half of the students reported a high health literacy level (43%, n = 365/855). When asked where students have heard about COVID-19, the majority reported the Internet and social media. Students reported a basic level of COVID-19 knowledge, but few students (18%, n = 173/966) correctly identified all three signs and/or symptoms of COVID-19. Results highlight the need for an increased public health presence on social media and the urgent need to remain diligent in educating community members about COVID-19 myths.

Keywords

e-health, risk communication, health literacy, infectious disease, internet, quantitative methods, social media, student health

COVID-19 (a.k.a. coronavirus disease 2019) was first reported from Wuhan, China, on December 31, 2019 (World Health Organization, 2020). Preliminary data from the Centers for Disease Control and Prevention (CDC) indicated that the virus has high fatality rates (specifically for older adults or those with underlying health conditions), effective medical treatment is lacking, and there is no vaccine. Rapidly sharing scientific information about COVID-19 is an effective way to improve public responsiveness and is key to providing real-time guidance to epidemiologists working to contain the outbreak, clinicians managing patients, and modelers helping understand future developments and effectiveness of interventions (Song & Karako, 2020). Public health officials and the media are intensely focused on COVID-19 as the world shutters schools and businesses and alters systems of care to quell spread of the disease. As such, there remains continued debate if the United States can effectively manage the COVID-19 crisis (Fauci et al., 2020), should further regulate travel and border control (Rocklöv et al., 2020), and responsibly elevate concern for the general population (Heymann & Shindo, 2020; Kobayashi et al., 2020).

There is limited information available about population knowledge and beliefs about COVID-19 and how current media and social media are accessed related to COVID-19. University students represent a unique population for assessing these variables due to their primary reliance on social media, proximate disruption of transitions to remote learning, and potential distal impact on careers. Critical to students engaging in action to protect their health includes learning if they have factual knowledge of COVID-19 signs and symptoms and where they get accurate, up-to-date information about public health and COVID-19. Specifically, the purpose of this study was to describe what university students know and believe about COVID-19 and where they get their information about the disease.

Methods

Data were collected from March 13 to 31, 2020, concurrent with the announcement to suspend in-person classes at the University. The university is an urban-serving university with approximately 15,000 students located in a Midwestern city

[1]Wichita State University, Wichita, KS, USA

Corresponding Author:
Nikki Keene Woods, Wichita State University, 1845 Fairmount St, Wichita, KS 67260, USA.
Email: Nikki.keenewoods@wichita.edu

with a population of approximately 390,000 people. The study was approved by the university institutional review board.

The survey included 27 questions on demographics, health literacy, and COVID-19. Questions were from previous CDC risk communication surveys (including health literacy; $n = 8$) and the remaining were created based on published CDC COVID-19 information ($n = 12$) and current Gallup polling strategies ($n = 7$). The survey was based on the information seeking as part of uncertainty reduction theory (Griffin et al., 2014). A random sample of 5,000 students currently enrolled in at least one course at the university received an email invitation to participate in the survey. The response rate was 23%, with 1,136 respondents starting the survey. Individual response rates varied for each question ($n = 579–1,067$). All students were eligible for a drawing for a $10 gift card incentive for participation. Respondents were mostly women (68%, $n = 646$), men were 30% ($n = 290$), and 2% ($n = 17$) were nonbinary or preferred not to answer. The mean age was 27 years (range 18–74, $SD = 9$). The highest percentage of respondents reported educational status as fourth year college students (31%, $n = 288$), and the majority (90%, $n = 851$) self-classified as domestic. Most (76%, $n = 701$) reported not having children. One hundred three university degree programs are represented in the data with the highest number of responses from engineering, nursing, and teaching majors. Less than half of the students reported a high health literacy level (43%, $n = 365/855$).

Results

Where Students Get Information About COVID-19

Eighty-five percent ($n = 839/987$) of students reported using email every day. However, email use decreased by year in college with first year students reporting the lowest daily email use at 69% ($n = 57/83$). When asked where students usually get information about health for specific diseases, the majority reported the Internet and social media "most often" and "always" as opposed to newspapers, radio, and television. Additional "most often" and "always" reported sources of information on health issues included family and friends, health professionals, and schools/universities as opposed to books/brochures and the faith community. When asked, "Where have you heard the most information about COVID-19?" most students responded the Internet (39%, $n = 394/992$) and social media (39%, $n = 298/992$), followed by radio and TV (11%, $n = 112/992$). Students were asked to rate the statement, "I am sick and tired of hearing about COVID-19" on a scale of 1 (*not tired*) to 5 (*very tired*), and the mean response was 2.65 ($SD = 1.51$) or "not really/neutral" ($n = 925$). Finally, students reported visiting a variety of online news sources for information in everyday life, including websites for television news (21%, $n = 545$), Facebook (15%, $n = 399$), and local or national papers' websites (13%, $n = 354$; Table 1).

Table 1. Student Online News Sources for Everyday Information.

Student responses	%	*n*
Website for television news show (e.g., KAKE news website)	21%	565
Facebook	15%	399
Local or National Paper website (e.g., *Wichita Eagle* or *Wall Street Journal*)	13%	354
News App (e.g., BuzzFeed or NPR)	10%	286
Twitter	9%	257
Email news newsletter (e.g., The Skimm)	6%	175
Other	6%	152
Instagram	6%	163
WSU Student Paper—The Sunflower (website or Facebook)	5%	138
Snapchat	4%	120
Podcast	3%	92
Comedy news sources	2%	50
Total (multiple response question)		2,751

What Students Know and Believe About COVID-19

Ninety-four percent ($n = 891/952$) of the study participants reported there is no cure for COVID-19. Few students (18%, $n = 173/966$) correctly identified all three signs and/or symptoms of COVID-19 (i.e., fever, cough, shortness of breath). When asked about more complex health conditions and COVID-19, students' level of knowledge further decreased. Only 7% ($n = 43/579$) of students correctly identified the CDC recommendations for pregnant women and nursing mothers. Additionally, most students said they would get a COVID-19 vaccine immediately if it were available (68%, $n = 635/937$).

Students indicated several beliefs about COVID-19, most notably they worry that family, friends, or they will get the virus, but had confidence they also could protect themselves from infection. Protection did not strongly include using facemasks or avoiding packages delivered from China. While students reported COVID-19 is a major global threat, they also expressed confidence in the ability of public health experts to do what is necessary to keep the community safe. Interestingly, they did not have the same level of confidence in the government's ability to handle this outbreak and only moderately believed experts will find a cure and that the threat soon will be over (Table 2). Most participants ($n = 812/950$) incorrectly reported older adults were "most at risk for being infected" with COVID-19. Last, 79% ($n = 747/952$) of students correctly identified 20-second handwashing as proper prevention for spreading the virus.

Table 2. Student Beliefs About COVID-19.

Survey question	Strongly disagree	Strongly agree	*M*	*n*
COVID-19 is a major global health threat	0	5	4.13	947
I'm worried my family and/or friends will get COVID-19	0	5	3.74	915
I can protect myself from getting COVID-19	0	5	3.69	947
Public health experts will do what it takes to keep the community safe from COVID-19	0	5	3.49	948
I'm worried I will get COVID-19	0	5	2.76	855
I am confident the government will be able to handle an outbreak of COVID-19 in this country	0	5	2.31	854
Disease experts will develop a treatment or cure for COVID-19 before it gets too bad	0	5	2.29	882
The COVID-19 threat soon will be over	0	5	2.27	881
I should use a facemask to prevent getting COVID-19	0	5	1.87	709
I can get COVID-19 from packages delivered from China	0	5	1.43	636

Discussion

Overall the survey respondents had some level of post high school education, with 25% being graduate students. Despite the high level of education, respondents were not knowledgeable about most COVID-19 factors beyond knowing if a cure was available. Few (18%) correctly identified the three symptoms of COVID-19 widely shared by the CDC, and even fewer (7%) correctly identified more technical information about breastfeeding and pregnancy with COVID-19. The low level of COVID-19 knowledge highlights the need to share additional disease-specific information in accessible ways through online and social media sites where populations are already engaged in information seeking behavior. With the amount of misinformation shared on social media sites continually increasing (Song & Karako, 2020), the need for increased public health information dissemination and engagement online through existing channels is of the utmost importance.

The most accessed sources for current COVID-19 information were the Internet (39%) and social media (39%), and respondents reported being neutral about hearing more about COVID-19. This information combined with how respondents reported accessing news via online sites in everyday life (television news [21%], Facebook [15%], and local or national papers' websites [13%]) can help health educators, medical service providers, and public health practitioners serving similar populations develop communication strategies to improve reach and enhance population knowledge.

Finally, health literacy levels were measured through three questions used by the CDC (2016). Less than half of students reported a high health literacy level (43%, n = 365/855), which is lower than national data for individuals who attended some college or technical school (47%) and those who graduated college or technical school (58%; CDC, 2016). While the health literacy level of respondents was unexpected, it may be an indicator of overall wellness of the population and the impact of the related pandemic stresses on individual self-efficacy. The results support the need for continued high-frequency communication touch points with high-risk communities and populations through most frequently accessed sources for news and health information.

This study was not without limitations. The greatest limitations were based in logistical challenges to complete a quick assessment of misperceptions in the early weeks of the U.S. outbreak. Other limitations include representativeness of the sample and the lack of race and ethnicity data from the sample. Data may not be generalizable for other universities that have a different demographic makeup, although the study sample was representative of the studied population when the demographics were compared. Responses may also present unidentified biases misunderstood in our current, unprecedented circumstances. Last, there was a wide range of variance in responses from question to question and decay in student completion of the survey that may impact the findings.

Conclusion

Study findings demonstrate the importance of increased public health information through trusted information channels and sources. Additionally, the student belief that public health experts versus the "government" will develop solutions to the COVID-19 pandemic could be a widespread belief in communities and could affect future communication messaging and strategies. Communities need to continue reinforcing where community members can go for reliable health information and supporting or reaching out to local news media with public health messages aimed at increasing COVID-19 knowledge and disease prevention strategies. Most respondents believe they can prevent being infected, so additional content about signs and symptoms and prevention strategies for COVID-19 should consistently be shared through community social media accounts and news partners.

Findings support remaining diligent in educating communities about COVID-19 myths. Although only a small percentage of students thought there was a cure for COVID-19, this remains a point for clarification along with the misperception that older adults are at greatest "risk for infection." As the group of respondents in this study had a higher level of education than the general population in the United States, findings support communities need continued education and reinforcement of COVID-19 known facts to address the abundance of misinformation available online and on social media sites.

Declaration of Conflicting Interests

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ORCID iD

Nikki Keene Woods https://orcid.org/0000-0001-8545-9010

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