

Knowledge of Teenagers and Young Adults about COVID-19 and Compliance with Social Distancing Guidelines

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Objectives: Understanding the coronavirus disease 2019 (COVID-19) knowledge and personal preventive behaviors of younger individuals is important as it can affect not only their own health but also the health of other potentially more vulnerable individuals. The aims of this study were to explore the knowledge of teenagers and young adults about COVID-19 and assess their personal preventive behavior.

Methods: We developed a 14-item questionnaire to conduct a cross-sectional online survey. Survey responses with missing variables were excluded. SPSS was used to perform the analyses, including descriptive statistics.

Results: Thirty-five participants, 15 to 27 years of age, completed the survey between May 2020 and March 2021. Thirty-one (88.57%) reported feeling sufficiently informed to avoid the risk of COVID-19 transmission. The most frequent sources of COVID-19 information were social media (68.6%) and parents (68.6%), whereas the least were teachers (11.4%). Thirty-three (94.29%) participants reported practicing social distancing, citing the main reasons to keep oneself, family members, and others safe. Thirty-three (94.29%) identified taking classes online instead of going to school as an example of social distancing, 26 (74.29%) calling friends on the telephone, and 24 (68.57%) going on a walk alone. Twelve (34.29%) chose eating infected foods and 8 (22.86%) touching animals, including pets, as transmission means for COVID-19. When asked about COVID-19 prevention, 34 (97.14%) reported that COVID-19 can be prevented by avoiding close contact with people who are sick, 31 (88.57%) by covering coughs and sneezes with a tissue, and 8 (22.86%) by avoiding contact with animals, including pets.

Conclusions: We found high awareness of COVID-19, but also identified important knowledge gaps about COVID-19 and preventive measures. Digital platforms and social media campaigns can be important

sources for providing evidence-based and age-appropriate information about COVID-19 and recommendations for safe activities to reduce social isolation during the pandemic and its negative mental health effects. This study also suggests that teachers may be an underused source of accurate information about COVID-19. These findings can be used to develop effective educational interventions to help combat the COVID-19 pandemic and its impact on young individuals.

Key Words: coronavirus disease 2019 (COVID-19), knowledge, social distancing, teenagers, young adults

Since the first reports of cases of coronavirus disease 2019 (COVID-19) from Wuhan, China at the end of 2019, more than 200 million confirmed cases of COVID-19 have been reported globally.¹ Understanding of COVID-19 is evolving. Children of all ages can contract COVID-19.²⁻⁴ Between March and December 2020, more than 1.2 million positive tests for severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2) were reported among children younger than 18 years of age and more than 1.6 million among 18- to 24-year-old individuals in the United States.⁵ The weekly number of COVID-19 cases reported to the Centers for Disease Control and Prevention among individuals younger than 21 years of age has increased over time in the United States.⁵⁻⁷ Although COVID-19 generally has been believed to be asymptomatic or mild in younger individuals, severe cases and even fatalities have been reported.⁸⁻¹⁰ As of July 31, 2020, 121 COVID-19-related deaths had been reported to the Centers for Disease Control and Prevention among individuals younger than 21 in the United States.⁶

Key Points

- We found high awareness of coronavirus disease 2019 (COVID-19) among the teenagers and young adults who completed the survey.
- We identified important knowledge gaps about COVID-19, preventive measures, and activities with minimal risk among study participants.
- Although teens and young adults obtain COVID-19 information from various sources, including social media and family, teachers seem to be an underused source of information.
- These findings can be used to develop effective and tailored educational interventions to help combat the COVID-19 pandemic and its impact on young individuals.

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Children of all ages can also transmit SARS-CoV-2 to others.^{11–14} Direct person-to-person respiratory transmission is believed to be the main mode of transmission of SARS-CoV-2.¹² Infected individuals who are asymptomatic may be less likely to isolate themselves from others. Particularly concerning would be transmission to older individuals at a higher risk of severe disease, hospitalization, and mortality. Personal preventive measures, such as masking, hand hygiene, respiratory hygiene, physical distancing, and avoiding crowds and close contact with ill individuals, have been associated with reductions in the incidence of SARS-CoV-2 infection and COVID-19-related deaths^{14–22} and remain important, especially in the setting of the emergence of more transmissible SARS-CoV-2 variants. Understanding the COVID-19 knowledge and personal preventive behaviors of younger individuals is important because it can affect not only their own health but also the health of other potentially more vulnerable individuals. The aims of this study were to explore the COVID-19 knowledge of teens and young adults and assess their personal preventive behavior. We hypothesized that there would be significant gaps in the COVID-19 knowledge and personal protective behavior of study participants.

Methods

This cross-sectional survey study was approved by the institutional review board at the University of Florida College of Medicine. Recruitment was via online social media. The link took participants to a Web site, which presented information about the survey and informed them that participation was voluntary and anonymous. Participants were not offered any type of incentive to complete the survey.

Survey

A 14-item electronic questionnaire was developed using Qualtrics (Qualtrics, Provo, UT). Five questions collected information on demographic variables (sex, age, race/ethnicity, grade in school, and place of residence). One question asked participants about their main source(s) of information about COVID-19. There were seven response options (eg, parents, teachers, social media) and more than one option could be chosen (Table 1). Three questions evaluated respondents' COVID-19 knowledge and more than one option could be chosen (Table 1).

One question asked about participants' perception of communication with parents. There were five response options (excellent, good, average, poor, terrible). Two questions with response choices of yes or no asked participants if they thought that they were sufficiently informed about COVID-19 and whether they practiced social distancing. Participants who reported social distancing were asked why, using an open field answer. Participants who reported not social distancing also were asked why and could choose more than one of the seven options provided.

Statistical Analyses

We excluded survey responses with missing variables. SPSS version 27 (SPSS IBM Statistics, Armonk, NY) was used to

Table 1. Questions, response choices, and frequencies of responses to the survey (N = 35)

Questions/answers	No.	%
Do you feel sufficiently informed to avoid risk of COVID-19 transmission?		
Yes	31	88.6
What has been your main source of information about COVID-19? Check all that apply.		
Parents	24	68.6
Teachers	4	11.4
Friends	10	28.6
Social media	24	68.6
Other Internet sources	18	51.4
Doctors, nurses, or other healthcare workers	12	34.3
Other	4	11.4
Would you rate your communication with your parents as		
Excellent	14	40
Good	14	40
Average	5	14.3
Poor	2	5.7
Terrible	0	0
How can you catch COVID-19? Check all that apply.		
Touching animals, including pets	8	22.86
Touching a surface or object that has the virus on it and then touching your own mouth, nose, or eyes	35	100
An infected person coughing or sneezing on you	35	100
Eating infected foods	12	34.29
From mosquitoes and ticks	0	0
Other	10	28.57
How can you prevent COVID-19? Check all that apply.		
Using a face mask at all times when in public	35	100
Cleaning hands often using soap and water	35	100
Cleaning hands often using an alcohol-based hand sanitizer	35	100
Avoiding close contact with people who are sick (coughing and sneezing)	34	97.14
Covering your coughs and sneezes with a tissue	31	88.57
Cleaning and disinfecting frequently touched surfaces and objects	35	100
Social distancing	35	100
Avoiding contact with animals, including pets	8	22.86
Other	6	17.14
What are some examples of social distancing? Check all that apply.		
Taking classes online instead of going to school	33	94.25
Attending sports events	0	0
Going on a walk by yourself	24	68.57
Playing basketball with your friends	0	0
Visiting friends	0	0
Calling friends on the telephone	26	74.29
Going on a cruise	0	0
Have you been practicing social distancing?		
Yes	33	94.29

COVID-19, coronavirus disease 2019.

perform the analyses, including descriptive statistics. Survey data were examined for the 14 items, and frequencies of item responses were reported to show the percentage of participants who selected each item-response option. The χ^2 tests were used to examine differences in responses by sex, age, race/ethnicity, grade in school, place of residence, perception of communication with parents, and perception of being sufficiently informed about COVID-19.

Results

We received 35 complete survey responses between May 2020 and March 2021. The mean age of the participants was 16.94 (standard deviation 2.57, range 15–27). The majority of participants were female (85.71%), White (60%), and reported residing in Florida (88.57%) (Table 2). Thirty-one (88.57%) reported feeling sufficiently informed to avoid risk of COVID-19 transmission. More participants who resided in Florida (93.55%) reported

Table 2. Demographic characteristics of survey respondents (N = 35)

Variable	No.	%
Sex		
Female	30	85.7
Male	5	14.3
Age, y		
15	9	25.7
16	15	42.9
17	2	5.7
18	2	5.7
19	2	5.7
20	3	8.6
23	1	2.9
27	1	2.9
Race/ethnicity		
Asian	5	14.3
Black	2	5.7
White	21	60
Hispanic	5	14.3
Other	2	5.7
Grade in school		
9th	2	5.7
10th	8	22.9
11th	15	42.9
12th	3	8.6
Postsecondary	7	20
Residence		
Florida, USA	31	88.6
Georgia, USA	1	2.9
Maryland, USA	1	2.9
Pennsylvania, USA	1	2.9
Tarn, France	1	2.9

feeling sufficiently informed, compared with participants who resided outside Florida (50%; $P = 0.010$). The most frequently reported sources of COVID-19 information were parents (68.6%) and social media (68.6%), whereas the least were teachers (11.4%) (Figure 1A). More girls reported social media as a main source of information about COVID-19 (76.67%) as compared with boys (20%) ($P = 0.012$). Participants younger than 20 years of age were more likely to report parents as a main source of COVID-19 information (76.67%) as compared with participants 20 years old and older (20%) ($P = 0.012$). Similarly, more participants who were in high school reported parents as a main source of information (82.14%) as compared with participants who had completed high school (14.29%) ($P = 0.001$). The majority of respondents (80%) rated their communication with their parents as excellent or good (Figure 1B).

All of the participants (100%) identified exposure to cough or sneeze of an infected person and touching a contaminated surface or object as modes of transmission of COVID-19 (Figure 1C). Although none chose mosquitos and ticks as vectors of COVID-19, 12 (34.29%) picked eating infected foods and 8 (22.86%) touching animals, including pets, as transmission means. Two of the participants (40%) who self-identified as Asian, two who self-identified as Black (100%), and four who self-identified as White (18.18%) chose animals as a mode of COVID-19 transmission, as opposed to none of the participants who self-identified as Hispanic or Other ($P = 0.047$).

When asked about COVID-19 prevention, all of the participants (100%) chose using a face mask in public, hand hygiene, social distancing, and cleaning and disinfecting frequently touched surfaces and objects (Figure 1D). Thirty-four (97.14%) reported that COVID-19 can be prevented by avoiding close contact with people who are sick, 31 (88.57%) by covering coughs and sneezes with a tissue, and 8 (22.86%) by avoiding contact with animals, including pets.

Thirty-three (94.29%) participants reported practicing social distancing, citing the main reasons to keep oneself, family members, and others safe. Thirty-three (94.29%) identified taking classes online instead of going to school as an example of social distancing, 26 (74.29%) calling friends on the telephone, and 24 (68.57%) going on a walk alone. No participant chose playing basketball with friends, attending a sports event, and going on a cruise as examples of social distancing. The main reasons provided for social distancing were to keep oneself (45%), family members (34.29%), and others (22.86%) safe. For example, one participant stated, “I have members of my family that are high risk and would suffer terrible consequences if they got sick.” Other examples of open-field responses to reasons for social distancing were “I live with my older grandparents and I’m immunocompromised myself,” “In order to prevent myself from potentially spreading the virus to my parents who are healthcare professionals,” and “because I don’t want other people to die because of me.” Other reasons were preventing COVID spread (eg, to “flatten the curve”), safety, and complying with recommendations. A 15-year-old girl and a 16-year-old girl reported

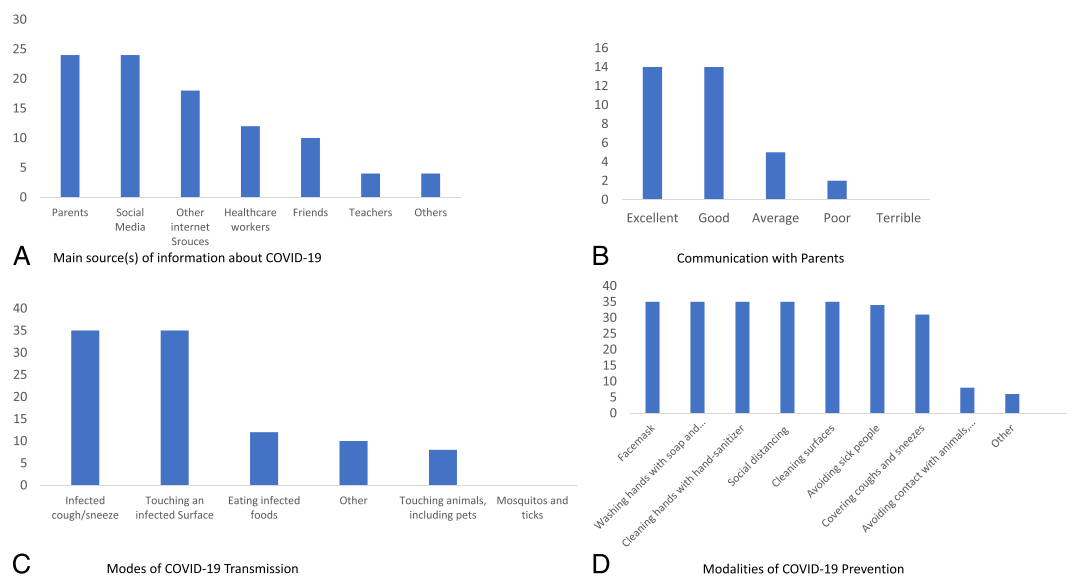


Fig. Responses to survey questions. (A) Main source(s) of information about COVID-19. (B) Communication with parents. (C) Modes of COVID-19 transmission. (D) Modalities of COVID-19 prevention. COVID-19, coronavirus disease 2019.

not practicing social distancing. One cited the desire to see one's friends as the reason and another chose "other."

Discussion

Similar to other studies among teens and young adults,^{23–25} we found high awareness of COVID-19, but also identified important knowledge gaps about COVID-19 and preventive measures among study participants. For example, although 100% of participants correctly cited social distancing as an effective protective measure, they were not all able to identify activities that would be safe, such as taking classes online instead of going to school, calling friends on the telephone, and going on a walk alone. All of the participants correctly identified "an infected person coughing or sneezing" as a mode of transmission, but not all chose respiratory hygiene examples as effective preventives measures. Twelve respondents (34.29%) believed that eating infected food can transmit the infection. Even though SARS-CoV-2 has been detected in nonrespiratory specimens, including stool, transmission through the fecal–oral route is not thought to be a significant factor in the spread of infection.²⁶ Finally, eight respondents (22.86%) believed that the infection could be transmitted by touching animals, including pets. It should be noted that although SARS-CoV-2 infection has been described in animals, there have not been any reports of domesticated animals (other than mink) transmitting SARS-CoV-2 infection to humans.^{27–29}

Other studies suggest that many teens and young adults are participating in recommended preventive behaviors^{23–25} and that youth motivated by the desire to protect others are more likely to engage in social distancing.^{30,31} Similarly, 94% of our respondents reported practicing social distancing, mainly to keep oneself, family members, and others safe. Consistent with previous studies, our participants reported obtaining COVID-19

information from various sources, including social media and family.^{23–25,32–34} Interestingly, the least frequently reported source of COVID-19 information in this study were teachers, which was similar to other studies.^{23,24} Researchers have expressed concern about the impact of the pandemic on stress, anxiety, depression, and loneliness among students.³⁵ The uncertainty and misunderstanding of our participants regarding social distancing rules is important as young individuals may be avoiding safe activities with a positive impact on their mood and well-being, such as touching pets or walking outside alone. The implications for public health officials would be creating content that provides up-to-date information to not only inform, instruct, and motivate young individuals to comply with preventive measures but also educate them about activities that can be safely continued without increasing risk to themselves or others.

One strength of this study was its timeliness. Participants were asked about their experiences as the pandemic was unfolding, and therefore their responses were not subject to recall bias. Although our knowledge of SARS-CoV-2, COVID-19, preventive measures, and treatment has been evolving, the questionnaire used for this study was not modified to reflect the changing horizon of COVID-19. The other limitations of this study include its small number of participants, reliance on self-report, and potential selection bias (because only teenagers and young adults on social media were included and because of the incomplete questionnaires that were excluded). Because of software limitations, incomplete survey responses were deleted as the study was ongoing and not tracked. The study sample is not representative of all adolescents and young adults, as girls and residents from the state of Florida were overrepresented. Furthermore, the study was conducted online, which may affect the representativeness of the current findings. Also, we did not assess participants' perception of risk of infection and severity of the illness to

themselves and their family. Finally, we only asked about the practice of social distancing and not other personal protective measures.

Conclusions

Although we found high awareness of COVID-19, this study identified important knowledge gaps about COVID-19 and social distancing among teenagers and young adults. Digital platforms and social media campaigns can be important sources for providing evidence-based and age-appropriate information about COVID-19 and recommendations for safe activities to reduce social isolation during the pandemic and its negative mental health effects.³⁵ This study also found that teachers may be underused sources for the dissemination of evidence-based information about COVID-19 and for deterring misinformation. These findings can be used to develop effective and tailored educational interventions to help combat the COVID-19 pandemic and its impact on young individuals.

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