

**A Mixed Methods Investigation of
How Young Adults in Virginia Received, Evaluated, and Responded
to COVID-19 Public Health Messaging**

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Introduction

Consistent public health policies and messaging can garner trust and compliance from the public, which are of vital importance during a pandemic. The key to effective messaging is timing, which can be seen in Singapore (Singapore 2020), Hong Kong (Kong 2020), and Taiwan (Piper 2020), who aggressively and transparently adopted such interventions when COVID-19 was first reported in China in early to mid-January. By informing their people early and often of the situation, these countries were able to keep their morbidity and mortality rates low compared to other places around the world.

In the United States, social distancing, lockdowns, and consistent public health messaging did not become the norm until mid to late-March 2020, resulting in large outbreaks of COVID-19 in places like New York, Michigan, and Louisiana. Early Pew (Blake 2020) and Gallup (Ritter 2020) polls from April 2020 showed that the public's overall opinion of COVID-19 media coverage was flat or favorable, and that consumption of local, national, and international media grew by 13%, 22%, and 17% respectively. A cross-sectional survey published in the *Annals of Internal Medicine* on April 9, 2020 showed that initial messaging was inconsistent and many Americans, including those with comorbidities that put them at higher risk, lacked critical knowledge about COVID-19 (Wolf et al. 2020).

As it became clear that the pandemic would likely last months or years instead of weeks, public health and medical professionals started adapting their messaging to reach the overall population, as well as particular age groups, more strategically. Initial messaging campaigns in early spring 2020 strongly emphasized the difference in morbidity and mortality between the young and the old, which resulted in an increased prevalence of both internal and external ageism (Sangrar, Chesser, and Porter 2020) and led some segments of the population to incorrectly believe that only the elderly and infirmed were at high-risk of COVID-19's worst health outcomes (Utych and Fowler 2020). This false belief became especially problematic in the late summer, when young people returned to college towns and engaged in risky behaviors that then allowed COVID-19 to spread into the local communities, often acting as asymptomatic carriers in places that have been advertised as ideal retirement destinations in recent years (Ivory, Gebeloff, and Mervosh 2020).

Several studies have shown that COVID-19 messaging that highlights the risk to older adults and the elderly "have little additive power in influencing attitudes and behaviors" of younger, healthier populations (Banker and Park 2020; Santariano 2020; Shelus et al. 2020; Waselewski et al. 2021). Instead, pro-social messages that specifically address and highlight the combined risks to both younger and older adults, especially in regards to long-term morbidity and health effects like long-haul COVID, appear to allow younger individuals to "perceive COVID-19 as a more serious threat" than initial messaging campaigns did (Utych and Fowler 2020). Distant pro-social messages that framed their purpose around protecting the overall community were observed to be significantly less effective with young people than those that focused on ways to "protect yourself" or "protect your loved ones" (Banker and Park 2020).

As with other mitigative behaviors and recommendations, pro-social masking messages that focused primarily on protecting high-risk individuals in a young person's life appeared to be the most effective, with other significant motivators being self-protection, responsibility, desire for control, requirements, and expert advice (Banker and Park 2020). Studies show that when young people are presented with messages that directly affect themselves or their loved ones, they are more likely to follow recommended COVID-19 guidelines, even in low-risk situations. This willingness to follow stricter safety precautions was found to especially apply to positive

and encouraging messages, which many participants felt were much appreciated given all the negativity in the news (Banker and Park 2020; Shelus et al. 2020).

A growing area of particular concern for effective COVID-19 messaging is misinformation and conspiracy theories. Multiple studies have shown that young people are more likely to believe COVID-19 misinformation, with one national survey that polled 21,196 people across the country showing that “respondents age 18 to 24 had an 18% probability of believing a false claim, compared to 9% for those over 65” (Baum et al. 2020; Santariano 2020). This contradicts past research studies that showed older age groups were more likely to believe or share false news claims on social media, particularly those age 65 and older (Guess, Nagler, and Tucker 2019). Masking and social distancing appeared to be the subjects most prone to misinformation and conspiracy theories among young people, along with the general belief that COVID-19 is nothing more than a minor flu or cold for those who are young, healthy, and have no co-morbidities (Baum et al. 2020; Belluck 2020; Imhoff and Lamberty 2020; Santariano 2020). Although the possibility of long-term side-effects from COVID-19 have been discussed among medical professionals and the scientific community since the pandemic’s start, it has become clear in recent months that “long-haul COVID” is affecting a larger proportion of the low-risk population than originally thought (Boehmer et al. 2020; Frenkel 2021; Puri et al. 2020).

As vaccines have become more widely available to the general public, it has also become clear that targeted public health messaging is going to be an essential component in counteracting misinformation and hesitancy, especially in groups that have already shown in earlier surveys to be hesitant with receiving either Covid-19 vaccines or most vaccines in general (Dror et al. 2020; MacDonald et al. 2015; Puri et al. 2020; Sallam 2021; Wang et al. 2021). Our statewide study shows that there will be a continued need for evidence-based public health messaging. This is especially true among younger groups of people who may believe that COVID-19 is only serious to the elderly or those who have several co-morbidities and are therefore reluctant to continue COVID-19 mitigation strategies like social distancing, mask wearing, and vaccinations.

The purpose of this mixed methods study was to examine how young adults in Virginia received, interpreted, and responded to messages related to the coronavirus/COVID-19, a major disruptor of our time, and to understand how and when these messages influenced behavior. Findings from this study can help inform ongoing public health messaging for young adults and help avoid future lags in adherence to public health guidelines

Methods

Sequential Explanatory Mixed Methods Design

To gain a robust understanding of how Virginia residents received, evaluated, and responded to COVID-19 public health messaging, we employed a sequential explanatory mixed methods design, starting with an online survey for the quantitative strand, followed by virtual focus groups for the qualitative. Recognizing that there are multiple ways of knowing, mixed methods researchers combine qualitative and quantitative methodologies to investigate phenomena more holistically. Of the various types of mixed methods designs, we utilized the sequential explanatory design to first gather survey data and then follow up with interested participants to engage in discussion about the “why,” “how,” and “what else” of survey findings.

Quantitative Data Collection and Analyses: Online Survey

We surveyed a convenience sample of Virginia residents by distributing a link to complete the survey online. The link was distributed through professional and personal email lists on Facebook and on flyers in select locations. Eligibility criteria included being 18 years of age or older and residing in Virginia. Participants provided informed consent prior to beginning the survey. The survey collected socio-demographic information including gender, age, race, ethnicity, level of education, income, employment status, occupation, changes in employment due to the pandemic, political affiliation, sexual orientation, and zip code. Participants were asked about their perceptions of COVID-19, risk mitigation behaviors, messages and events that influenced their beliefs and behaviors, and where they obtained information that they trust. The full survey is available in the appendix.

For this analysis, we included survey respondents who reported an age of 18 to 24 years old. We conducted exploratory analyses by calculating descriptive statistics of survey responses and examining correlations between information sources, perceptions, beliefs, and risk mitigating behaviors related to the COVID-19 pandemic using Pearson's Chi-squared test. We also investigated correlates of the fundamental risk mitigating behaviors, mask wearing, and social/physical distancing in unadjusted and adjusted analyses using logistic regression with robust variance estimates. Statistical significance was defined as $p < 0.05$. All quantitative analyses were conducted using Stata/SE 16.1 and Microsoft Excel.

Qualitative Data Collection and Analysis: Virtual Focus Groups

Focus group participants were recruited in two ways:

1. After completing the COVID-19 messaging survey, participants were given the option of entering their contact information into a separate Google form. The Google form included questions on gender, age, race/ethnicity, and zip code. Responses to the Google form were not linked with responses to the messaging survey.
2. Participants were recruited through an introductory health class at a university in Virginia. If they were interested in participating, potential respondents filled out the Google form described above.

All young adults (ages 18-24) who filled out the Google form after taking the survey were invited to participate in the first focus group. Three out of seven participated.

Due to small numbers, of those who filled out the interest form as part of a class, all non-White young adults (ages 18-24) were invited, in order to improve representation in our sample. White young adults (18-24) were ordered randomly using Stata/SE 16.1. A total of 23 out of the invited 58 participated.

Seven focus groups with a total of 26 participants were conducted from July 10, 2020 through October 2, 2020. Of the 26 total focus group participants, 23 were women (88.46%) and three were men (11.54%). The young adults primarily described themselves as middle income (76.92%), while 19.23% reported being high income and 3.8% reported low income. Most (53.84%) participants were non-Hispanic White, while 26.9% were Black or African American, 11.54% were Asian, and 7.69% were of Hispanic, Latinx, or Spanish origin. Focus groups lasted no more than 90 minutes and took place over the Zoom online meeting platform to account for COVID-19 safety measures. Each focus group had 3-5 participants. Focus groups were audio recorded and transcribed. Participants received a \$25 gift card for their participation.

Questions asked in the focus groups focused on where participants first heard about COVID-19, what messages they had heard, which ones they believed/trusted, and what messages

had been confusing or contradictory. Focus groups also included questions about social distancing and stay-at-home orders, mask wearing, perspectives on how the pandemic had been handled, and their strategies for navigating/coping with the pandemic.

Participants provided verbal consent before the focus group started and prior to audio recording. All focus groups were recorded, transcribed, and uploaded as Word documents into Atlas.ti. A hybrid of inductive and deductive coding was used for theme generation. In following the deductive method, a series of potential codes to look for was determined ahead of time to help identify emerging themes based on a preliminary data analysis of the survey [38 codes]. Following an inductive method, new themes that emerged during the data analysis process were coded, compiled and summarized [8 codes]. Two coders looked for emerging themes common to all the focus groups. A third person coded a subset of the focus group to verify themes across coders. Codes were organized into seven final themes summarized in the qualitative findings below.

Results

Quantitative Findings

Survey Respondent Characteristics

The survey was open from May 19 to July 19, 2020. Of the 3,694 total survey respondents, 207 were 18 to 24 years old and included in this analysis focusing on young adults. Of the young adult respondents, 86% completed the survey in May, 13% in June, and 1% in July. Nineteen percent reported a zip code in Blacksburg, Virginia, where the study was initiated, but at least one individual reported one of 115 unique zip codes across the state. Sociodemographic characteristics are presented in Table 1. Most were female (77%), non-Hispanic White (79%), and identified as heterosexual or straight (82%). Most (91%) had completed at least some college or other post-high school education or training. Twenty-nine percent reported less than \$20,000 in annual household income, 47% between \$20,000 and \$99,999, and 21% over \$100,000. Nearly half (49%) of respondents identified as Democrat, 19% as Republican, 16% as Independent, and 16% had no preference/other. Employment status was not mutually exclusive and 55% of respondents reported being students, 31% had full-time employment, and 20% had part-time employment. In evaluating the effects of the COVID-19 virus on employment, 34% of respondents reported a loss of or reduced employment or income, while 54% reported no change in their employment status and 4% gained employment and/or income.

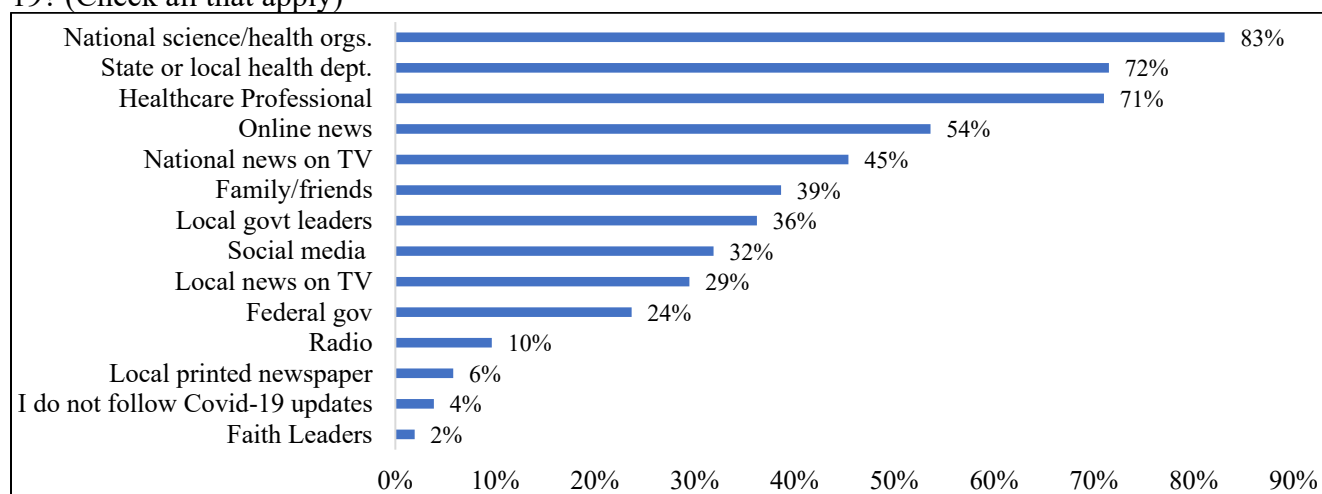
Table 1. Characteristics of young adult survey respondents (N = 207).

Variables	N (%)
Sex/Gender	
Female	160 (77%)
Male	44 (21%)
Other	3 (1%)
Race/Ethnicity	
American Indian or Alaska Native	0 (0%)
Asian	8 (4%)
Black	2 (2%)
Middle Eastern	2 (1%)
Multiracial	15 (7%)
White non-Hispanic	163 (79%)
Ethnicity	
Hispanic	15 (7%)
non-Hispanic	192 (93%)
Sexual Orientation	
Heterosexual or straight	169 (82%)
LGBTQ+	36 (17%)
Political Affiliation	
Republican	39 (19%)
Democrat	102 (49%)
Independent	34 (16%)
Other	8 (4%)
No preference	24 (12%)
Education	
Less than high school degree	0 (0%)
High school or GED	19 (9%)
Trade school or Associate degree	11 (5%)
Some college (no degree)	67 (32%)
Bachelor's degree	99 (47%)
Master's degree	11 (5%)
Doctoral or professional degree	0 (0%)
Household Income	
Less than \$20,000	60 (29%)
\$20,000 to \$39,999	38 (18%)
\$40,000 to \$59,999	28 (14%)
\$60,000 to \$79,999	19 (9%)
\$80,000 to \$99,999	13 (6%)
\$100,000 or more	43 (21%)

Trusted Information Sources

Most (83%) respondents reported national science and health organizations as a trusted source for COVID-19 information and over 50% of respondents reported getting information from state/local health departments (72%), healthcare professionals (71%), and online news sources (51%). Information sources reported by 10% or less of respondents included the radio (10%), local printed newspaper (6%), and faith leaders (2%). Only 4% of respondents reported not following any COVID-19 updates (see Figure 1).

Figure 1. Responses to “Where do you get information that you trust about coronavirus/COVID-19? (Check all that apply)”

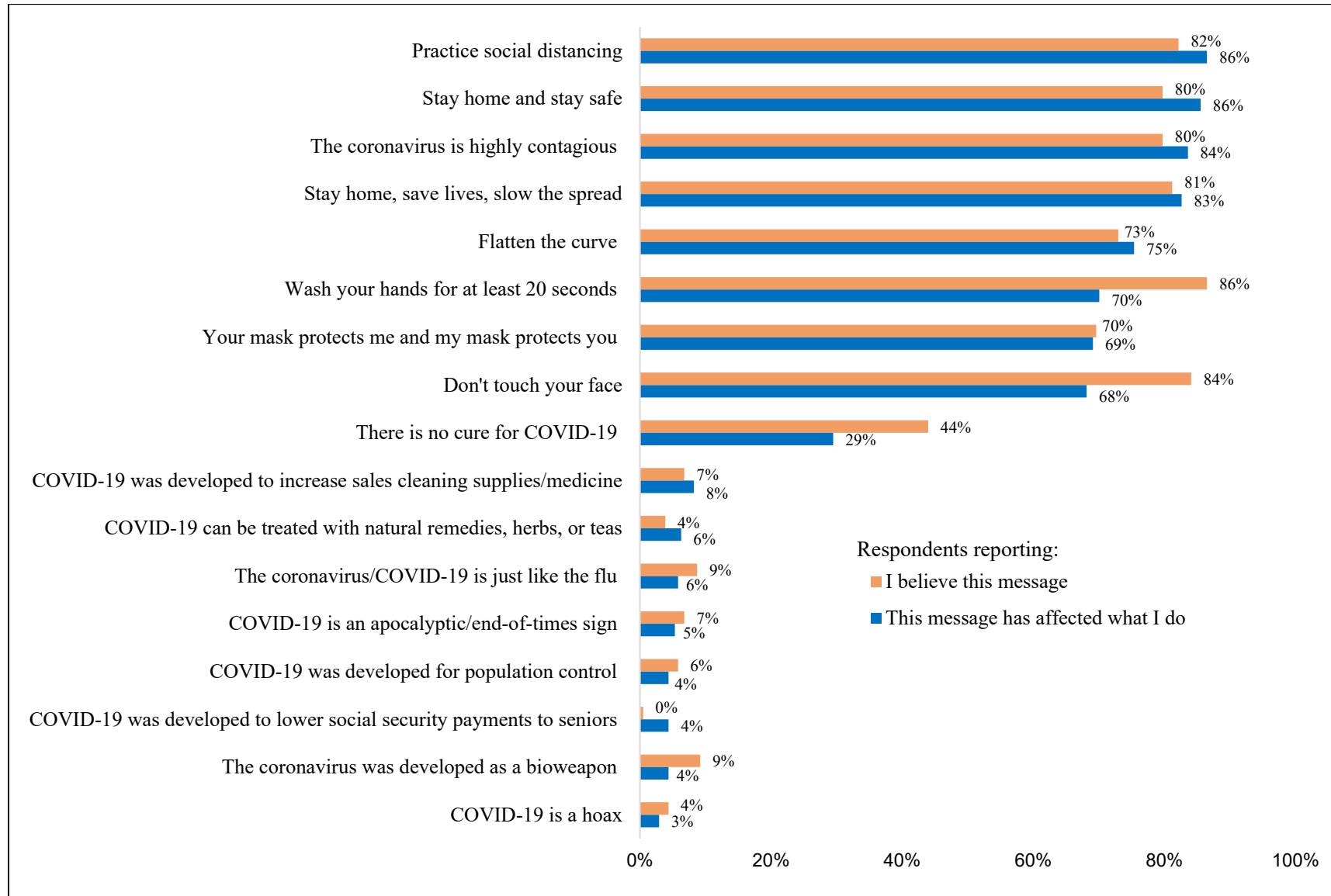


Messaging Related to COVID-19

Over 80% of respondents reported that the following messages impacted their beliefs and behaviors: “practice social distancing,” “stay home and stay safe,” “the coronavirus is highly contagious,” and/or “stay home, save lives, slow the spread” (see Figure 2). Twenty-two percent of respondents reported believing in one or more of the following alternative messages: COVID-19 was “developed as a bioweapon” (9%), was “developed to lower social security payments to seniors” (0.5%), “is a sign of the apocalypse/end times” (7%), “is a hoax” (4%), “can be treated with natural remedies” (4%), was “developed for population control” (4%), and/or was “developed to increase sales of cleaning supplies” (7%). A similar proportion of men and women (20% vs. 23%, respectively) (see Figure 3a), less of those with than without a college degree (18% vs. 27%, respectively) (see Figure 3b), and more of those who identified as non-Hispanic White (30%) compared to other races/ethnicities (20%) believed in one or more of the alternative messages (see Figure 3c). More Republicans (36%) than Democrats (17%) and others (23%) believed in an alternative message (see Figure 3d) and this was the only characteristic that was statistically significantly different. Eighty-seven percent of those who did not believe an alternative message obtained information that they trusted from national science and health organizations like the CDC and NIH compared to 70% who believed one or more of the alternative messages and this difference was statistically significant (see figure 3e).

Young Adults in Virginia and COVID-19 Public Health Messaging

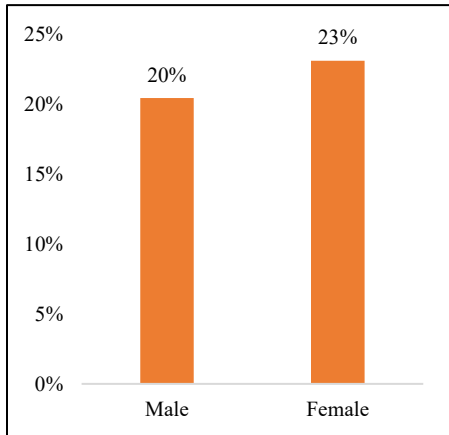
Figure 2. Responses to “The following messages are related to the coronavirus/COVID-19 (not all are true). Please check all that apply if you have heard, believe, and/or changed your behavior based on each message.”



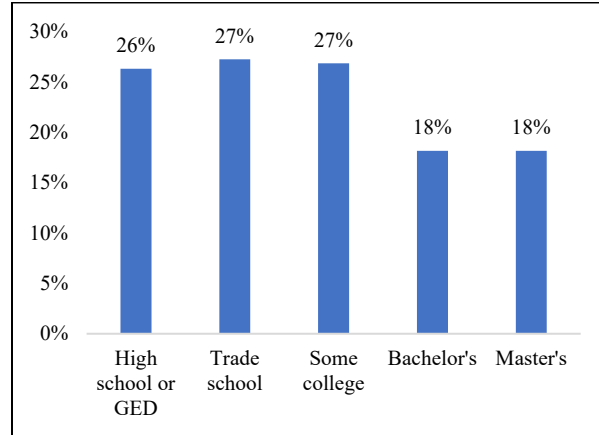
Young Adults in Virginia and COVID-19 Public Health Messaging

Figure 3. Percent of respondents who believed “alternative” messages by select characteristics.

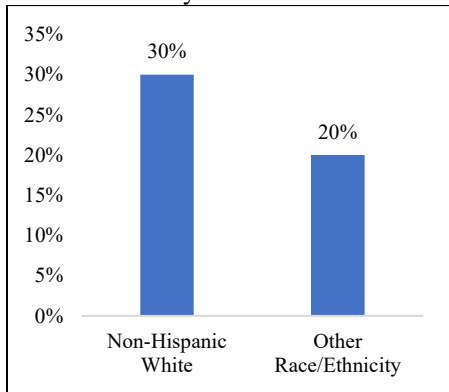
A. Gender



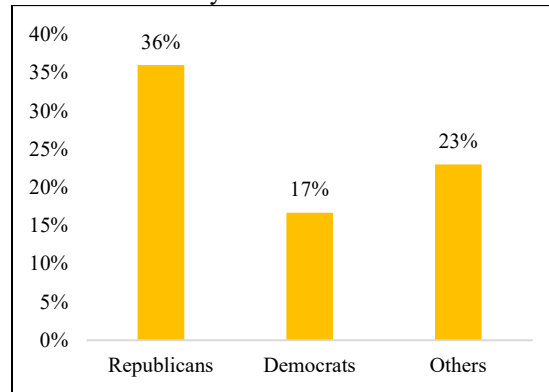
B. Education



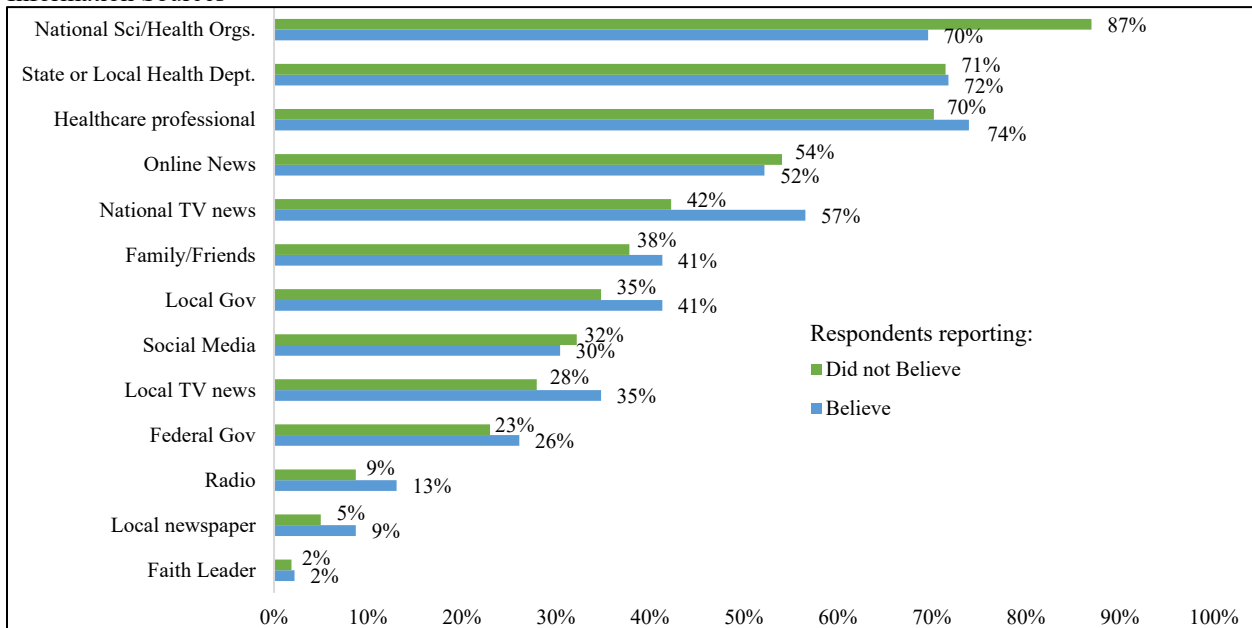
C. Race/Ethnicity



D. Political Identity



E. Percent of respondents who believed and did not believe “alternative” messages by self-reported “trusted Information Sources”



Behaviors Related to COVID-19

The proportion of individuals reporting mask wearing and social/physical distancing increased with increasing level of education (see Figure 4a) and were higher in women than men (see Figure 4b), non-White vs. non-Hispanic White individuals, Democrats vs. Republicans and others (see Figure 4c), and those identifying as LGBTQ+ vs. heterosexual/straight (see Figure 4d). Differences in mask wearing were statistically significant for gender, race/ethnicity, and political party in unadjusted analyses and when adjusting for race, political party, and gender in multivariable analysis (see Table 2). Differences in distancing were only statistically significant for political party in both unadjusted and adjusted analyses.

Figure 4. Percent of respondents who reported wearing a mask distancing in public in response to the pandemic by select characteristics.

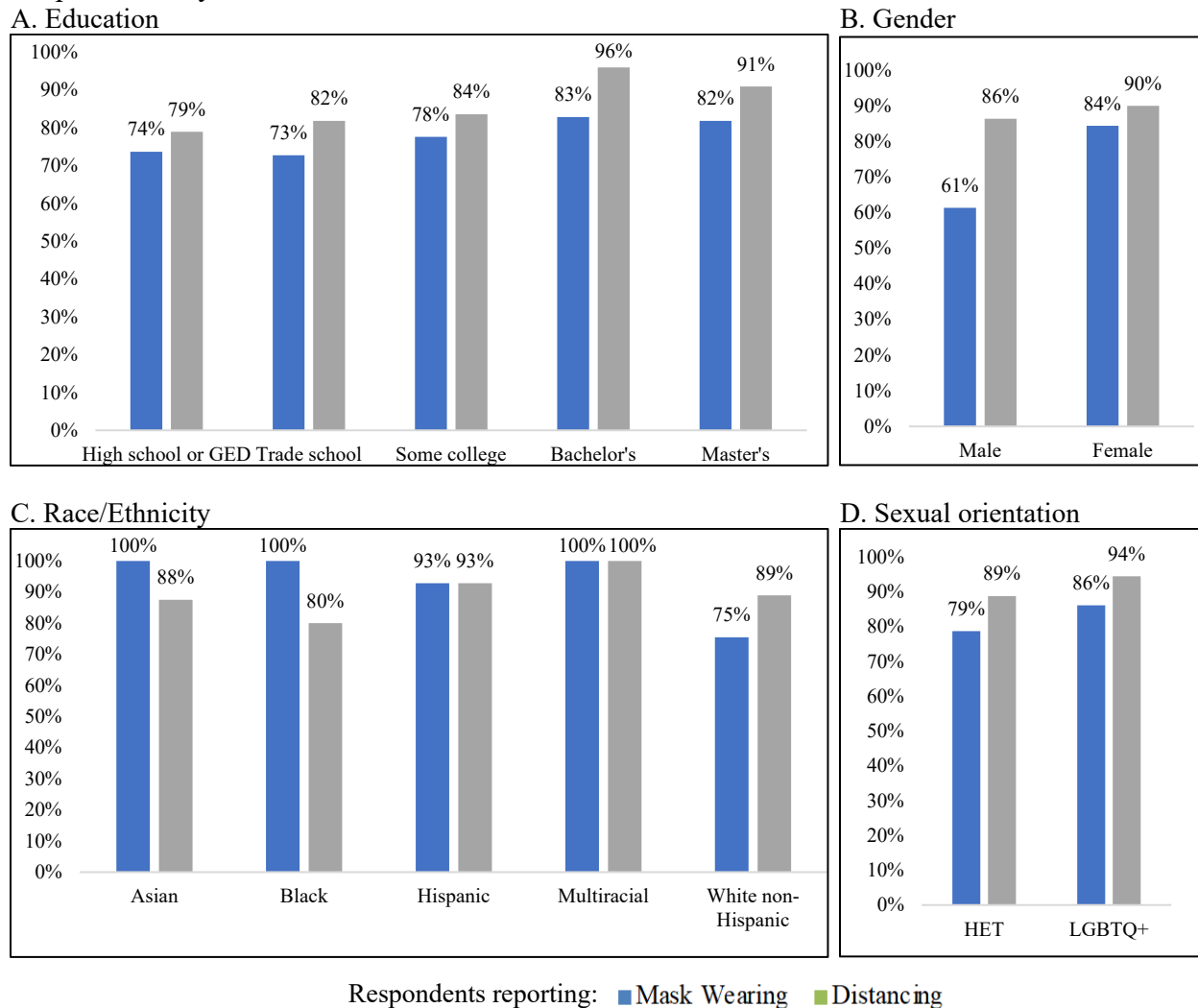


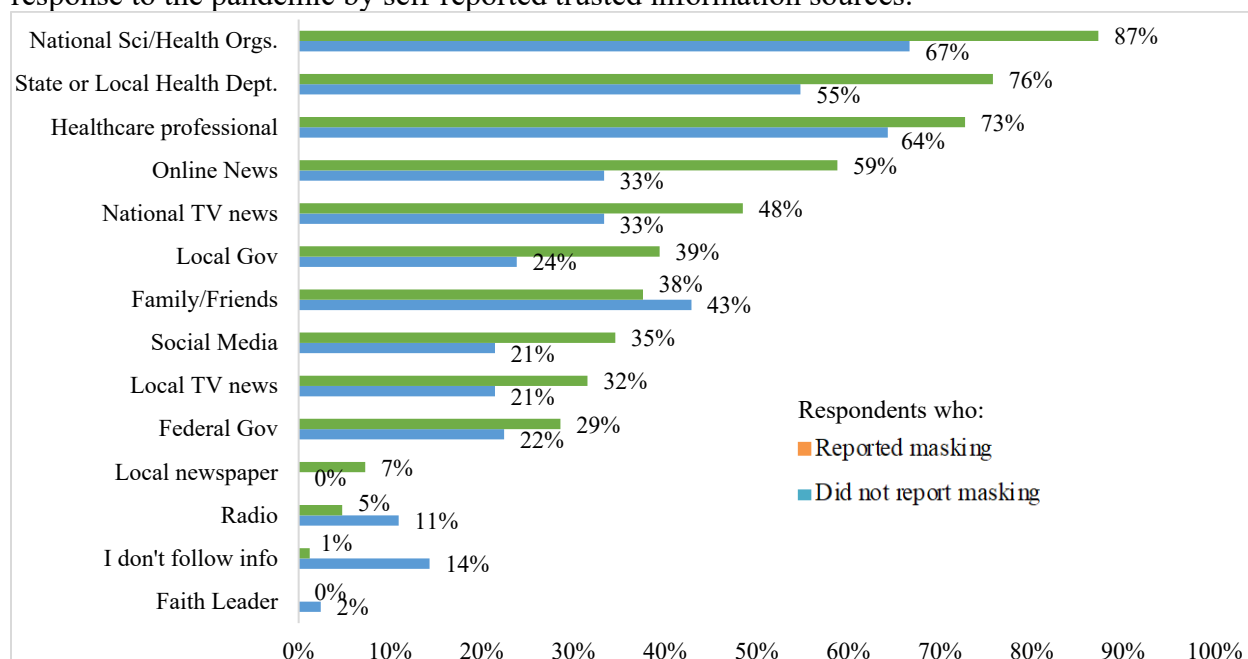
Table 2. Odds ratios (ORs) of reporting not wearing masks in public and not practicing social/physical distancing using logistic regression with robust standard errors (N=207*).

No Mask Wearing	Unadjusted	Adjusted
	OR (95% CI); p-value	OR (95% CI); p-value
Male vs. Female	3.40 (1.62-7.2); 0.001	3.25 (1.53-6.9); 0.002
Non-Hispanic White vs. other race/ethnicities	6.83 (1.58-29.6); 0.010	5.78 (1.21-27.5); 0.028
Republicans vs. Democrats	5.75 (2.29-14.4); <0.001	4.84 (1.83-12.8); 0.002
Other vs. Democrats	3.19 (1.36-7.5); 0.008	2.45 (1.00-5.9); 0.048
No Distancing		
Male vs. Female	1.42 (0.52-3.9); 0.494	1.11 (0.41-3.0); 0.837
Non-Hispanic White vs. other race/ethnicities	1.24 (0.40-3.9); 0.710	0.77 (0.22-2.7); 0.678
Republicans vs. Democrats	9.9 (2.51-39.1); 0.001	10.15 (2.34-44.0); 0.002
Others vs. Democrats	5.9 (1.55-22.4); 0.009	6.01 (1.47-24.6); 0.012

*3 reporting other gender were excluded from the adjusted analyses (N=204).

A smaller proportion of those who reported not wearing a mask received trusted information from all sources except for family and friends and radio, compared to those who reported wearing a mask when in public (see Figure 5). Of those, the proportion of mask wearers who reported receiving trusted information from online news, national sciences organizations, and state or local health departments was statistically significantly greater than non-mask wearers. Fourteen percent of those who did not wear a mask reported not following any information related to COVID-19, compared to 1% of those who reported mask wearing, which was also statistically significant.

Figure 5. Percent of respondents who reported and did not report wearing a mask in public in response to the pandemic by self-reported trusted information sources.



Qualitative Findings

Social Media

Social media played an important role in how young adults received messaging throughout the COVID-19 pandemic. Participants discussed social media during the conversations, noting that they first heard about COVID-19 on platforms such as Snapchat and Twitter. Another way that social media played an important role was as a source for students to report each other to local authorities, with one participant stating, “I've seen people tagging [the university], tagging, like [university] PD, like, oh, like, you know, you're letting people on the bus without any mask on.” Social media was also how participants noticed differences in mask wearing, as they saw people in public wearing them, but not in private with others outside of their immediate households. Young adults also thought social media was a format that could be used to strengthen messaging, by using celebrities or making graphics for the general public. Young adults were also attentive to the polarizing sides of social media, noting that platforms like Facebook allowed for them to “see a lot of ridiculousness on social media that I do not trust,” that family members and acquaintances tend to share or support.

The Role of Prevention Messaging

Prevention messages heard. Most young adult participants mentioned prevention measures to reduce the spread and contraction of COVID-19 which included mask wearing, social distancing, hand washing, and sanitizing hands and surfaces. Young adults mentioned the importance of wearing masks, which was a common practice when going outside of their household. A young adult participant indicated “so the mask was obviously like a huge one. Just everywhere, stores or like, just on the news every time, right? You just hear, ‘wear a mask’ or people share on their stories all the time, ‘you need to do this.’” A young adult participant described how seriously his/her parents took mask wearing saying, “they went and they wore like gloves and masks and they would like sanitize everything. Um, so yeah, they took it pretty seriously.”

Young adults mentioned staying home or staying six feet apart and being distanced from others when going places. A young adult participant mentioned, “Um, I heard a lot of like, ‘stay six feet apart.’ Um, and I know we all hear that six feet apart.” Handwashing and sanitizing surfaces was also a common practice that young adults mentioned. One participant said, “And then I just remember, just like, ‘wash your hands all the time, as soon as you get home for like, at least 30 seconds at a time.’ And just like the most too is just don't touch your face when you're in public or out with others.”

As one participant noted: “...wearing your mask, washing your hands as frequently as possible, keeping distance at all times, and like, especially if you're in groups like wearing masks, keeping six-foot distance. I feel like all those are ones that have like stayed pretty important throughout the whole thing.”

Messages still needed. Young adult participants discussed various messages still needed. Most young adults indicated the need for more educational messaging surrounding COVID-19. A young adult participant indicated, “I think it would definitely be helpful to have some type of public education platform. I agree that it would need to be something that's very simple to understand, and not too much information at once.”

Some of the young adult participants indicated that they didn't understand the process of transmission and contraction of COVID-19, nor the long-term effects of COVID-19 once someone has contracted it. A young adult participant said, “I think a lot of people don't fully

understand or know all of the different types of modes of transmission. And also like, pretty much no one really knows the long-term effects of this, just because it is also new.”

Some participants indicated that messages about recommended guidelines and necessary precautions will provide more clarity into the importance of quarantining, social distancing, and masking so that young adults will take the COVID-19 pandemic more seriously. A young adult participant said, “just general health guidelines like I think the CDC or, you know, even the government, should come out and talk about like the importance of wearing masks and kind of be a direct messenger for everybody, um, kind of where we're at.”

Some young adult participants indicated a need for more messages that reflect personal stories of people who did not survive COVID-19, as opposed to just the recovery stories. A young adult participant said, “but I actually like know this girl whose whole family got it and her dad, her mom, and her grandma died. So now it's just her and her brother. And that's really sad. But people don't really talk about those stories.” Another young adult participant said, “I feel like I hear a lot of things about people like who recover and, you know, have no symptoms or mild ones, but they don't talk enough about that people actually die from it.”

Lastly, young adult participants discussed the importance of mental health and why it should be addressed. A young adult participant said, “I think mental health is something that's really important during this time. And I don't feel like it's being addressed enough.”

Unreliable Messages

Confusing/contradictory messaging and distrust in messaging. Most young adults indicated that the messages surrounding mask wearing was confusing and contradictory. “In the very beginning I remember, um, no one knew whether to wear a mask or not to wear a mask and, um, a lot of people didn't, and a lot of people did and it kind of kept flip flopping.” Another young adult said, “I am still stuck on the fact that they told us that masks were bad or not helpful and now masks are helpful.” This led some young adults to question public health experts and health organizations such as the CDC.

In addition, young adults indicated how messages about the spread COVID-19 were confusing. One young adult said, “There's a lot of things where they were talking about how it transmits through touch, but now they're saying it's only through the air. So, I don't know.” The unknown about the spread of the disease raised concern of how seriously young adults were taking the COVID-19 pandemic. One young adult mentioned, “Especially people my age, I think there's this idea of invincibility when they don't realize it, like they could still give [it]...just because you have the antibody doesn't mean you can't get the virus.”

Moreover, young adults indicated that they do not know who/what to trust, as information about the COVID-19 pandemic is constantly changing. One young adult said, “I think the hardest part for me with all this stuff is that it is constantly changing. And so that kind of makes it difficult for me to trust 100%.” Another young adult said, “It is really hard to figure out who to trust and then realize that things change over time as there's more evidence.”

Politicization of messaging and anti-Asian comments/behaviors. Some young adults mentioned misinformation from then President Donald Trump and how he has made the COVID-19 pandemic a political issue. In addition, some young adults mentioned hearing anti-Asian comments, saying, “it's because of the Chinese” and “China did this in order to like, wipe us out, like bioterrorism and stuff like that.”

Influences on Young Adults' Behavior During the Pandemic

Sentimental/emotional reasons for behaviors. Participants in all focus groups mentioned at least one sentimental or emotional reason driving their behaviors and decision-making. Some of the focus groups participants' behaviors during the pandemic were driven by fear. At the beginning of the pandemic, it was a fear of not knowing what was going on, not knowing the severity of COVID-19, and fearing that they were not being told everything they needed to know. "I was pretty scared because I had no idea what was going on." This fear waned over time, as the understanding of the virus became clearer.

Participants were scared of not making the right decision, and constantly having to think through every decision and its potential ramifications. Participants were also scared of inadvertently hurting someone they love or care for by passing them the virus. "I just feel like I'm constantly overreacting or under reacting. Or like whatever I'm doing is wrong. Like, I'm either overreacting and it's a waste of time and like depriving, or I'm under reacting and like going to kill everyone I love." There was also a sense of guilt at potentially being the one to infect someone else, or in some way cause an outbreak. "I canceled my 21st birthday party because I was like, one of my friends thought she came into contact with the virus and I was like, I would feel really guilty if anything happened. So I think it's not even like the virus that really gets me, it's more like the feelings of guilt that kind of motivate my social distancing." The fear of having to tell friends that they were a contact also drove some decision-making. "I was like thinking about COVID, but not just having COVID, but having to call my friends that I've interacted with and like the people...I've interacted with and telling them I had COVID and they might have it, and that was just terrifying. I never really like thought of that before."

Participants' behaviors were also driven by perceptions of what others thought about them. Mask-wearing seemed to be the behavior most influenced by perceptions. For some, they didn't want to wear a mask for fear of how it made them look. "I just I really don't think that there's that much consideration for the whole like mask thing, especially when you're my age, and people care a lot about, you know, their appearances and how their friends see them and stuff." Many participants wore a mask because of the perceived stigma and disapproval of others if not wearing a mask. "We were always all about perception. I think like how we were perceived by other people. We didn't want to be perceived as like, insensitive or rude. It was ...less than because we actually believed it. Um I mean, we did believe it, but like we were totally fine not wearing it too."

Finally, for some participants, their decision-making and behaviors were driven by their desire to protect others. This usually came in the form of taking precautions such as quarantining before seeing a higher risk family member (such as a parent or grandparent) and practicing safer socializing while living with a higher risk family member. As one participant noted, "Another, I guess, big message that I heard was protecting the people around you– um especially the elderly or anybody who's at a higher risk kind of thing. And so, I have really tried to keep that in mind as well in terms of more intense quarantining if I know I'm going to see, like, when I visit my grandmother kind of thing, more intense quarantining for things like that."

Logical reasons for behaviors. The young adults frequently cited their own and others' actions taken due to the messages they heard surrounding COVID-19. These actions included cleaning hands frequently, sanitizing groceries and packages, ordering groceries for delivery or pickup, visiting grocery stores less often, not eating inside of restaurants, and avoiding large gatherings. The participants also discussed quarantining after they traveled for spring break, or if they were about to see a more high-risk family member, like grandparents.

Mask wearing behaviors emerged in response to a variety of topics. Several participants noted that the change in leaders saying the general public should not wear masks, to saying that they should, created mistrust and feelings of betrayal. However, the young adults committed to the change and noted that the mandate aligned with when they regularly began wearing a mask. The participants discussed the situations they wore masks in, as well as the ones where they did not. They noted public places as areas where they consistently wore masks. However, in a home with roommates, friends, and family some participants choose to not wear masks. Many stated they have groups of friends they do not wear masks with, but will wear one around anyone else. Deciding when to wear a mask outdoors was a topic often discussed, with some stating they wore masks outside in public spaces or carried a mask while exercising in case they needed one. Some shared that the stigma around not wearing a mask strongly influenced their behaviors. One participant noted, "...we started wearing them pretty much right away because that's just what people around us were doing and I think we were uncomfortable not wearing them if other people around us were wearing because we didn't want appear, cut off, or come across as rude."

Social distancing behaviors were a common topic in the focus groups as well. Participants quickly began social distancing early on when the stay-at-home order began. However, some shared that they became less strict about it, especially when they returned to campus or when restrictions began to ease. One participant summarized this saying, "And it's just me and my mom. And, um, we were like, really, really strict about following the guidelines and everything. But as the months went on, I would occasionally see a few of my friends like from my hometown, and like someone mentioned, we would usually just sit outside in like lawn chairs, like further apart." Several shared they created select groups with friends they trusted to interact with unmasked and not distanced. Participants also noted that they often saw large groups gathering on social media or out in public around the community.

Defiance

While there were many reasons why young adults followed public health guidelines, there were also reasons why some did not adhere to guidelines at various points in the pandemic. In the beginning of the pandemic, some young adults did not yield to guidelines because they initially did not take COVID-19 seriously. As the pandemic continued, there were times when young people could not or would not adhere to guidelines due to factors such as needing to work for income, not taking guidelines seriously since they were not being enforced, socializing because they prioritized their mental health, and decreased fear of COVID-19 over time.

A college student shared, "A couple of my friends that pay for their tuition and pay their rent, ...tried to social distance, and they followed majority of the guidelines, but it was harder for them when it first happened to fully social distance, because they needed to find a way to pay for the stuff that they were obligated to pay for." Another student declared, "I'd say my job definitely prevented me from being as safe as I would have liked to be."

Several young adults shared that the enforcement, or lack thereof, of public health guidelines influenced their own or their peers' adherence to guidelines. For example, one participant shared, "but it was like not like people were enforcing it as much and so I personally didn't feel like I had to wear a mask until it was you know, I was going to get kicked out if I wasn't wearing one."

As the pandemic continued, young adults' behaviors and adherence to guidelines shifted. One young adult explained that caring for others had been their primary reason for following guidelines, but that they now prioritized human interaction over protection from COVID-19.

They explained that “in public, most people are taking [it] seriously, like they don't want to put others at risk. But as far as like ourselves, I think we care less. Like, we'd rather have human interaction. ... For me, it's a little different because my sister got it and I was fine. So, I don't want to get it. I don't want to get sick. I don't want to potentially be in a hospital or anything, but I'm also not as scared as I was a couple of months ago.” Another participant shared that prolonged adherence to guidelines was especially difficult for students, who “are all very like outgoing, like the party kind of people.” That student shared that while they did follow guidelines while at home, “since being back at school, I do think that people are taking things serious, maybe not as serious as they should. But like I said, um, our generation we're just not, we're not going to be perfect in something like this, especially being back in our college town.” Some students' families did not adhere to guidelines. One student shared, “especially with some religious family members that are like, ‘if God wants me to get it, I'm going to get it, so it doesn't matter.’ Like I'll wear a mask if I have to in a store, but they were having like family gatherings and stuff, which is foolish, but I know I can't change their minds.”

Another college student cited mental health concerns as a reason for departure from public health guidelines. They shared, “I think what makes it hard to socially distance yourself is just like, like the mental part of it. Just like not seeing other people or like, there are some people who are my neighbors, I like won't see them because we're supposed to be socially distant. It's just kind of sad. It's my senior year. It's my last year. I kind of just, like, want to get my degree and get out at this point. But, I mean, I think it's just that makes it also easier just knowing like if we all do our part we'll be out of this quicker.”

Socializing

Participants found creative ways to spend time with loved ones and friends, while still adhering to public health guidelines. They wore masks, spent time in small groups outdoors and distanced, or in nature. As one participant stated, “I kind of saw some friends but we would either sit outside kind of like on chairs six feet apart, or wear masks.”

Many of the participants stated that they would have liked to be offered more options for healthy ways to socialize instead of being told what not to do. “And it's hard during this time, but I don't see enough messages about alternative options. And the truth is, we're all feeling ‘Zoomed out.’ Like, we are tired of Zoom. So, I don't know, some panel of creativity, I feel like it needs to be happening for how to address these needs, especially for people that are extroverted.” Some participants saw their peers being shamed on social media for being out and socializing without adhering to public health guidelines.

In the Fall of 2020, at least one university in Virginia urged students to join small “pods.” A pod is “a small group of students who are able to interact with each other more closely and in a more relaxed, un-masked environment. In order to do so, students in a pod make a commitment to rigorously follow safety measures including face coverings and physical distancing when interacting with anyone outside of the pod.” (Virginia Tech, 2022) Participants who were students at this university showed a varied understanding and implementation of the pods. For many students, even though they were in a pod, there was often someone in the pod who went outside the pod to socialize. This was especially difficult for students whose roommates and friends consisted of two different circles and for those who had a significant other who was not in their pod. This quote by a student participant exemplifies that difficulty and potential consequences. “But I think the hardest thing, even with like, keeping your circle very tight is like for example, if I only saw five people total outside of my roommates, but then my roommates

also saw five people, and then those five people that we saw, saw another five people, that is like ends up being 100 people right there.” For the students whose main group of friends was also the people they lived with, it was a lot easier to follow the pod model. For those students whose small group of friends were all on the same page as far as prevention, pod life was also easier. “And it's just easy to stick with the people that you know and have that same mentality with them all, you know, just staying together.”

Participants discussed the differences between their mask wearing and distancing behaviors while out in public versus in private. Many of the participants discussed wearing their mask consistently when in public, on campus, or indoors in a public setting, but rarely wearing one when with friends, even indoors. Participants did not distinguish between friends in their pod or other “trusted” friends. As one student put it, “I wear a mask in public settings or when I'm with people that I don't know. But when I'm with my friends, because I live off campus, I don't wear one.” Another participant echoed this sentiment. “If I'm at a friend's house or something, I won't wear it and that might be kind of irresponsible, but I probably trust the person and I'm really close with them anyways, to not wear a mask.”

Participants often referred to the concept of “trust” while deciding who to socialize with. Participants were more likely to not wear a mask and not distance if they were with someone whose behaviors they trusted. “I won't go over a friend's house unless I know that they're trustworthy and I know exactly where they've been and that they're safe.” Still, there was some doubt about trusted friends' behaviors. “I feel like you can trust your close friends, but you also aren't sure because even if they're being safe, if they come into contact with someone who's not being safe, then that's kind of how it happens.” Participants also checked in with each other before socializing, to ensure that everyone had been safe. “With my friends, we usually try and see each other on the weekend. So just before we're about to meet up, we'll just kind of check in with each other and make sure that we've been safe during the week or like, just double check if we've seen anyone outside of our circle and families.” Most participants noted that they did not wear a mask or distance with their family members.

Institutional and Governmental Responses

Economy as a priority. Many of the young adults thought that the priority of students wasn't being addressed at their universities. Some students discussed that there were limited services available on campus, yet they were having to pay additional fees. As one young adult said, “They were going to make you pay a copay after like three visits for psychiatric visits for like \$25, when we already paid like a health fee.” In addition, students were still having to pay tuition, even if they were not on campus. As one young adult indicated, “Campuses definitely wanted the students back, because I felt like they lost a lot of money last semester by giving refunds, ending the semester early, all those types of things, and also investing in COVID-19 preparation for this semester. So they just wanted to get at least some of that money back.” Overall, students indicated that they thought their universities did not prioritize their needs, as indicated by one young adult who said, “I feel like honestly, like [my university] doesn't care about me as a student. They just kind of want my money....and I've seen how other schools have dealt with Corona– like schools that are bigger than [my university].”

Role of closing, mandates and the lockdown. For many of the young adult participants, mandates, lockdowns, and school closings signified a shift in their attitude towards the pandemic and influenced their behaviors. Several participants started taking the pandemic seriously when their university closed after spring break. “...when we heard [during] spring break, like we're not

going to return, that's when things got like, serious.” For a few of the participants, the school closure was the first time they had heard about the pandemic. Most participants started systematically wearing a mask once it was mandated.

Young adults participating in the focus groups noted a wide range of interpretation of Governor Northam’s stay-at-home orders. Many participants chose to interact with fewer people, and to visit with people outdoors and distanced. Others were very strict and only interacted with immediate family members in their household. Some viewed it as an opportunity to reconnect with their immediate family once they moved back home. “It was nice to like, rekindle the relationship I have with my mom and my dad. Like, my family's pretty close.”

Participants observed others not taking the stay-at-home order seriously. Most of the participants expressed frustration that the Virginia stay-at-home orders did not start earlier, last longer and come with heavier enforcement. As one participant noted, “I feel like people are like, ‘oh, well stay at home doesn’t mean to stay in your house all day.’ They kind of made their own rules about it and were still going out places that they could.” Another participant stated, “Even when we went into our lockdown, it wasn't a true lockdown.” Participants also noted the differences between stay-at-home orders in the US and in other countries. Many participants perceived countries with stricter lockdowns and stricter enforcement as having better success at containing the virus than the US.

Discussion

The sequential explanatory mixed methods design allowed for a rich investigation of young adult Virginians’ COVID-19 information sources, evaluations of various COVID-19 messages, and reactions to COVID-19 public health messaging. The convenience sample used for the survey was augmented by the use of the focus groups, which allowed researchers to gain a greater understanding of the perspective of young adults that would not be readily apparent based on the survey findings alone. Conducting focus groups after the messaging survey data were collected and analyzed enabled researchers to intentionally develop the focus group question guide to yield deeper insights around how young adults in Virginia were accessing, evaluating, and adapting their behavior in response to various COVID-19 messages.

Focus group data highlighted the importance of social media. Many young adults reported first hearing about COVID-19 through social media and highlighted the positive role social media could have played if deployed more effectively with trusted messaging for the general public. Focus group participants clearly identified the problem of confusing/contradictory messaging, exacerbated by polarization of messages, juxtaposed against the political landscape in the nation.

Motivational factors for adhering to COVID-19 mitigation strategies included both emotional and logical reasons. Emotional decisions included fear, guilt, perception of others, and desire to protect others. The impact of the pandemic on socialization in the young adult population generated discussion and review of strategies to support socialization albeit limited through “pods.” The concept of trust also contributed to young adult Virginians’ decision-making around whom to socialize with during the pandemic. Young adults had to balance taking appropriate preventative measures with the need to socialize and work outside the home.

The data generated in this study provides valuable insights for future public health messaging to young adults. The stories and reports of those who experienced the pandemic firsthand illustrate many opportunities for improvement for the present and the future. The young adult data generated in this study illustrates the need for improved public education regarding

mitigation strategies for controlling a virus while living through a pandemic. The need for fact-based, positive behavioral health messaging emerged clearly from the collective stories in the focus groups. The data also emphasized that since the coronavirus is mobile and is not contained with state boundaries, there is a grave need for consistent, fact-based, national messaging. A national approach with consistent fact-based messaging could help reduce anxiety, confusion, misinformation, and consequently the spread of the disease and ultimately reduce mortality.

The COVID-19 pandemic presented enormous challenges on a variety of fronts. Efforts to prevent and mitigate transmission of the virus were compromised by mixed messaging, as demonstrated in comments from young adult focus group participants. The focus group data reveal that there were many concerns with the messaging young adults received about COVID-19. As such, despite the urgency of pandemic response, health professionals must be acutely thoughtful about their communication with the public about evidence-based practices to prevent or mitigate transmission of a virus. The harm of mixed and negative messaging is self-evident given the rise of COVID transmission in populations who do not adopt behaviors to decrease transmission of the virus. The young adults in this study have provided an abundance of data on the critical importance of communication during a pandemic. We must learn from the data and stories provided to assure we are better prepared as a nation to navigate high-risk public health circumstances in the future.

Limitations

Like all research, this study has its limitations. This was an internet-based convenience sample of adults in Virginia and may not be representative and generalizable to other populations. Women were overrepresented in focus groups. Other genders may have different perspectives than those gathered in the focus groups conducted in this study. This article reports on attitudes and perceptions of young adults prior to availability of the COVID-19 vaccine in the United States.

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