

Motivators and Barriers to COVID-19 Vaccination in Young Adults Living in the USA

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Young-Me Lee, PhD, RN¹ , Shannon D. Simonovich, PhD, RN¹,
Suling Li, PhD, APRN, FNP-BC¹, Lily Amer, BS¹,
LeAnne Wagner, MFA¹, Janet Hill, MFA¹,
Roxanne Spulark, DNP, APRN, FNP-C¹,
and Elizabeth Aquino, PhD, RN²

Abstract

High rates of COVID-19 infection and lower vaccination rates among young adults aged 18 to 26 in the United States prompted this study to examine motivating factors and barriers to COVID-19 vaccination and identify preferences in COVID-19 vaccine education. Three focus group discussions were completed. Transcribed data were analyzed using thematic analysis. Three key themes were identified including (1) motivating factors to vaccination, (2) barriers to vaccination, and (3) COVID-19 vaccination educational intervention design recommendations. Motivating factors included five relevant subthemes: civic duty, fear related to the disease process; fear related to emerging variants and breakthroughs; fear regarding the suffering of others; and freedom. Barriers included four subthemes: lack of trust, misinformation, politics, and pressure. Attempts to further educate young adults about the COVID-19 vaccine should consider strategies that target motivating factors and barriers while also making accurate information accessible through social media.

Keywords

COVID-19 vaccine, motivations, barriers, young adults, focus group

Introduction

Since the first positive case of COVID-19 was reported in January 2020 in the United States, young adults have consistently reported the highest cumulative incidence of COVID-19 infection (Centers for Disease Control and Prevention [CDC], 2022a). Because young adults have high rates of asymptomatic infection and active social lives, they are more likely to transmit COVID-19 infection than others, and most responsible for the spread of COVID-19 within their personal networks and communities (CDC, 2022a). A previous study revealed that one-third of young adults were vulnerable to developing severe COVID-19 illness if they were infected (Adams et al., 2021). According to the CDC's COVID-2019-Associated Hospitalization Surveillance Network, rates of COVID-19-associated hospitalizations in January 2022 remained higher in unvaccinated adults than in fully vaccinated adults (CDC, 2022b). Despite this fact, adults aged 18 to 26 years were least likely to report having received a COVID-19 vaccine and were most likely to report being unsure about getting vaccinated (CDC, 2021, 2022c).

The Kaiser Family Foundation (KFF) (2021) reported the similar finding that young adults ranked highest in intention to “wait and see” before accepting COVID-19 vaccination (KFF, 2021). Data released in 2022 by the KFF align with the historically lower vaccination rates, showing that only 67% of young adults between the ages of 18 and 29 received the primary series of COVID-19 vaccines. The vaccination rate has significantly increased since May 2021, when 28.4% of 18- to 29-year-olds reported being vaccinated (Baack et al., 2021). However, this age group still remains at the lowest rate for vaccination in comparison to all other age groups—ages 65 and older (85%), ages 50 to 64 (71%), and ages 30 to 49 (71%) (KFF, 2022). This is of great concern because young

¹DePaul University, Chicago, IL, USA

²University of Illinois at Chicago, Chicago, IL, USA

Corresponding Author:

Young-Me Lee, School of Nursing, DePaul University, 990. W. Fullerton Avenue, Chicago, IL 60614, USA.
Email: Ylee23@depaul.edu

adults are more likely to transmit the virus than others and reportedly have the highest cumulative incidence of COVID-19 infection in the country (CDC, 2022a). This has resulted in surges of disease in the surrounding communities during the COVID-19 crisis (CDC, 2020). As a result, the CDC has indicated an urgent need to enhance COVID-19 vaccination as the most effective community mitigation strategy, along with personal preventive behaviors for young adults to help reduce infection and subsequent transmission to persons at higher risk of severe illness (CDC, 2020).

Several pharmaceutical companies and research laboratories have developed COVID-19 vaccines with mRNA, DNA, subunits, virus-like particles, and viral vectors (E. Kim et al., 2020; Zhang et al., 2020). With emergency vaccine approval from the FDA, a national vaccination program began in the United States, and millions of people started to receive the COVID-19 vaccine. Although the acceptance of COVID-19 vaccines has been identified as key mitigation strategy for protecting vulnerable populations and regaining our pre-pandemic social and economic lives, vaccine hesitancy raises concerns and challenges (Adams et al., 2021; Fisher et al., 2020; Kamisar & Holzberg, 2020). Research into the underlying reasons for vaccine hesitancy among adults in the United States has identified vaccine-specific concerns (e.g., side effects, safety and efficacy, and the speed with which the vaccines were developed), a need for more information, a lack of trust, and negative attitudes toward and perceptions of the COVID-19 vaccine (Fisher et al., 2020; Silverman, 2020; Thigpen & Funk, 2020).

Young adults living in the United States have consistently been vaccinated at lower rates, so previous studies have investigated factors for vaccine hesitancy and reported similar factors found in the general population (Adams et al., 2021; Fisher et al., 2020; Gurley et al., 2021; S. J. Kim et al., 2022). Negative perceptions related to unknown long-term effects of the COVID-19 vaccine and unknown underlying conditions were found to be major barriers affecting young adults' vaccination decisions (Adams et al., 2021; Brandt, et al., 2021; Gurley et al., 2021; S. J. Kim et al., 2022). Concerns about vaccine safety is another barrier to COVID-19 vaccination among young adults (Adams et al., 2021). In addition, misinformation about the COVID-19 vaccine and its development process is a common deterring factor, increasing vaccine hesitancy and reducing the intention to get vaccinated (Coulaud et al., 2022; Lee et al., 2022). Another interesting finding is that young adults who reported a lower level of concern for COVID-19 impact on family are more likely to refuse the vaccine (Coulaud et al., 2022). However, the majority of previous studies on young adult vaccine acceptance focused on college and/or medical students. These studies have not provided a comprehensive understanding of vaccine perceptions that include both vaccinated and

unvaccinated young adults and they provide little information about what motivates those who get vaccinated.

Study Aims

Despite the current high rates of COVID-19 infection, vaccination rates remain low among young adults living in the United States, who often function as vectors of infectious disease within their personal networks and communities. Few studies have examined young adults' perspectives regarding the COVID-19 vaccine, and no known studies have described young adults' perspectives and preferences surrounding COVID-19 vaccine education designed to increase vaccine acceptance and uptake. The purpose of this study was to examine motivating factors and barriers to COVID-19 vaccination as well as preferences in COVID-19 vaccine education in young adults aged 18 to 26. The findings obtained from the focus group discussions will be helpful to identify effective strategies to enhance vaccine uptake and to develop the future development of an educational intervention tailored to today's young adult population living in the United States.

Conceptual Framework

For this study, the Health Belief Model (HBM) was the conceptual framework that helped guide the understanding of vaccine-related health behavior among young adults. The HBM is frequently used to study a wide range of health-related behaviors to explain why people engage in healthy behavior and to understand the motivations behind health behaviors (Janz & Becker, 1984). The underlying assumption of the HBM is that health actions depend on a person's perceived threat of a health program and opinion of a recommended action for managing or preventing disease (Janz & Becker, 1984). The HBM contains defining constructs, including perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action that influence health behavior (Janz & Becker, 1984). Perceived susceptibility refers to a person's subjective perception of the risk of acquiring COVID-19. Perceived severity refers to a person's belief about the seriousness of COVID-19 symptoms and whether one would survive the disease. Perceived benefits are related to a person's belief that the COVID-19 vaccine would decrease the possibility and severity of COVID-19. In this behavior change model, the perceived risk of COVID-19, perceived seriousness of COVID-19, and perceived benefits of vaccination can motivate preventive behavior (Carico et al., 2021; Janz & Becker, 1984). Perceived barriers include any hindrance preventing vaccination. These four perceived constructs play a central role in influencing COVID-19 vaccine-related action among young adults and explain vaccination behavior, referred to as a cue to action.

Methods

Design

Exploratory qualitative focus group discussions were conducted to learn about COVID-19 vaccine perspectives from young adults and identify preferred educational content and delivery methods. Because few studies have been conducted on this newly emerging and evolving topic, a qualitative design was used to obtain an in-depth understanding of the young adults' experiences and perceptions to identify essential elements to develop and include in the educational program.

Sample

Purposive sampling was employed to specifically recruit vaccinated, undecided, and unvaccinated young adults aged 18 to 26 for the purpose of this study. Participants were recruited via an electronic flyer shared through the researchers' networks and social media. The use of social media allowed for a broader reach of recruitment. Individuals interested in participating in the study emailed a designated email address established for the purpose of this study. Once an email was received from a potential participant, the research assistant sent a prescreening questionnaire to interested participants to ensure they met the inclusion criteria. The prescreening questions included the following: age, gender, ethnicity, and vaccine status to determine eligibility. Then the research team met to select the participants that would be invited to participate in one of the three different focus groups. Three to five focus groups are considered an adequate number for qualitative research focus groups (Krueger & Casey, 2000). In terms of the focus group size, they typically have six to eight participants. A small group consisting of three to five participants is suitable if the study is designed to obtain in-depth insights (Krueger & Casey, 2000). After selecting the participants, the research assistant sent email invitations to participate in the focus group discussions.

Focus groups

Three focus groups were conducted in this study. Originally, our research team tried to recruit three focus groups: (1) vaccinated, (2) undecided, and (3) against vaccination. However, we experienced difficulty recruiting young adults who were either undecided or unvaccinated; therefore, we decided to conduct three focus groups with two vaccinated groups and one group combined undecided and unvaccinated. The undecided and unvaccinated groups were combined because both groups were unvaccinated and could collectively speak to the specific decision factors or barriers to vaccination and preferred sources of education.

Data Collection

The focus group data were collected in June 2021. The three focus groups were conducted virtually and recorded via zoom.

Focus group discussions were led with a semi-structured discussion guide developed based on key concepts of perceptions and cue to action retrieved from the HBM, previous literature, and the researchers' experiences working on COVID-19 research with nurses and young adults (Appendix Table A1). The interview discussion guide was divided into two major parts. The first part focused on COVID-19 and COVID-19 vaccine-related knowledge and perceptions. The second part focused on cues to action and health motivation asking about informational content and preferred learning platforms useful for proving recommendations for educational programs. For consistency, the three focus groups were led by the same two investigators with one investigator facilitating the discussion and a research assistant taking notes. Prior to starting the discussion, the investigators read the information sheet aloud (participants also received and signed the form prior to participating in the focus group) and reminded participants to respect the privacy of the other participants by not repeating what is said in the focus group to others. All participants kept their cameras on during the focus group discussions and the facilitator ensured all participants had an opportunity to answer the questions. To compensate the participants' time, all participants had an opportunity to enter their email address into a raffle giveaway where two email addresses would be selected to receive a U.S \$50 Amazon e-gift card.

Data Analysis

Qualitative analysis of the focus group data began with automated transcriptions via Happy Scribe cloud-based software followed by line-by-line verification of the transcripts by a research assistant. Thematic analysis of the three focus group discussions was completed formally by two PhD-prepared qualitative researchers on the study team. First, preliminary coding was conducted by two researchers, the codes were then shared and discussed with the research team at which point consensus was formed around the global themes as well. Next, the researchers used Dedoose cloud-based software to code all of the data to ensure all of the relevant quotes were identified. The global themes that emerged were related to motivating factors and barriers influencing COVID-19 vaccination behavior in young adults. The final themes and illustrative quotes were organized into tables in Microsoft excel.

Methodological Rigor

In qualitative inquiry, trust in the research findings is established through trustworthiness procedure (Stahl & King, 2021). In terms of credibility and trustworthiness which establishes congruency of the findings with reality was achieved through investigator triangulation which involved two experienced qualitative researchers involved with the creation of the interview discussion, conducting the interviews, and participation in data analysis. In addition, theoretical triangulation was used with the HBM to direct and

Table 1. Study Sample Characteristics.

Age	21.9 (SD 2.3, 18–26)
Gender (%)	
Female	11 (68)
Male	5 (31)
Race (%)	
White	7 (43.75)
Asian	5 (31.25)
Black	2 (12.5)
Multiracial	2 (12.5)
Vaccination perspective (%)	
Pro-vaccine	11 (67)
Anti-vaccine	4 (25)
Undecided	1 (6)

Note. SD = standard deviation.

understand the research. Transferability in trustworthiness was accomplished by providing thick description of the research context, data analysis processes, and selection of participants. Dependability was enhanced because findings were also verified by other research team members. They reviewed direct quotations from transcribed text to ensure that the data adequately represented the information provided by the participants.

Ethical Consideration

This study was reviewed and approved by University Institutional Review Board (IRB) before commencement of recruitment and data collection. All participants were advised to carefully review the informed sheet and had ample time to ask any questions or express concerns. Participants were also informed that their participation was voluntary and that they could withdraw their participation any time without penalty.

Findings

Demographic Profile of Participants

Three focus groups were conducted ($N=16$). The sample characteristics of the study participants are detailed in Table 1. Overall, study participants had a mean age of 21.9 (standard deviation 2.3), with a range of 18 to 26. The study sample was predominantly female (68%). Study sample was racially and ethnically diverse with the majority of participants, 56.25% ($n=9$), identifying as Asian, Black, or Multiracial. Among the sample of 16 study participants, there was a representation of pro-vaccine (66.78%), anti-vaccine (25%), and undecided perspectives (6%).

Key Themes

Three key themes were identified during data analysis including (1) motivating factors to vaccination, (2) barriers

to vaccination, and (3) COVID-19 vaccination educational intervention design recommendations (Figure 1). This focus group study was intentionally inclusive in design. It was the goal to determine the shared themes across a diverse group of U.S.-based young adults reflective of society rather than individualize and compare vaccine perspectives by study participant sociodemographic characteristics.

Motivating factors to COVID-19 vaccination. Within motivating factors to COVID-19 vaccination, five relevant sub-themes emerged: (1.1) civic duty, (1.2) fear related to the disease process, (1.3) fear related to emerging variants and breakthroughs, (1.4) fear regarding the suffering of others, and (1.5) freedom.

Theme 1.1. Civil duty. The first motivating factor influencing COVID-19 vaccination behavior in U.S.-based young adults was civil duty. The theme of civil duty describes the desire to behave responsibly in a way that is respectful of societal expectations. One focus group participant shared, “It was my responsibility to get vaccinated,” with another adding that it is their individual duty to “protect the people who are around us” to “be a good person.” One participant shared upon learning of COVID-19 vaccination availability:

When the news came out I definitely wanted to get it. Similar to what other people have said just to help with like future prevention and to try like I feel like one of the main purposes, like to get as many people vaccinated as possible, so you know disease spread is less we can eventually get rid of it so.

The theme of vaccination for COVID-19 as a moral responsibility and a civil duty was well described among young adults in the focus group discussions.

Theme 1.2. Fear related to the disease process. The second motivating factor influencing COVID-19 vaccination behavior in U.S.-based young adults was fear of the disease process. The theme of fear of the disease process describes a fear-driven desire to be vaccinated to be protected against COVID-19 infection. One participant shared, “I did want to get [vaccinated] because I wanted to not be afraid to get COVID.” Another participant also shared, “I was really anxious and really scared that if I had gotten COVID that I would have been on a ventilator.” The fear of the COVID-19 disease process was a motivating factor in encouraging vaccination among U.S.-based young adults.

Theme 1.3. Fear related to emerging variants and breakthroughs. The third motivating factor influencing COVID-19 vaccination behavior in U.S.-based young adults was fear of emerging variants and breakthroughs. The theme of fear of emerging variants and breakthroughs describes the concerns around new strains of COVID-19 and rising COVID-19 cases among individuals who had previously experienced

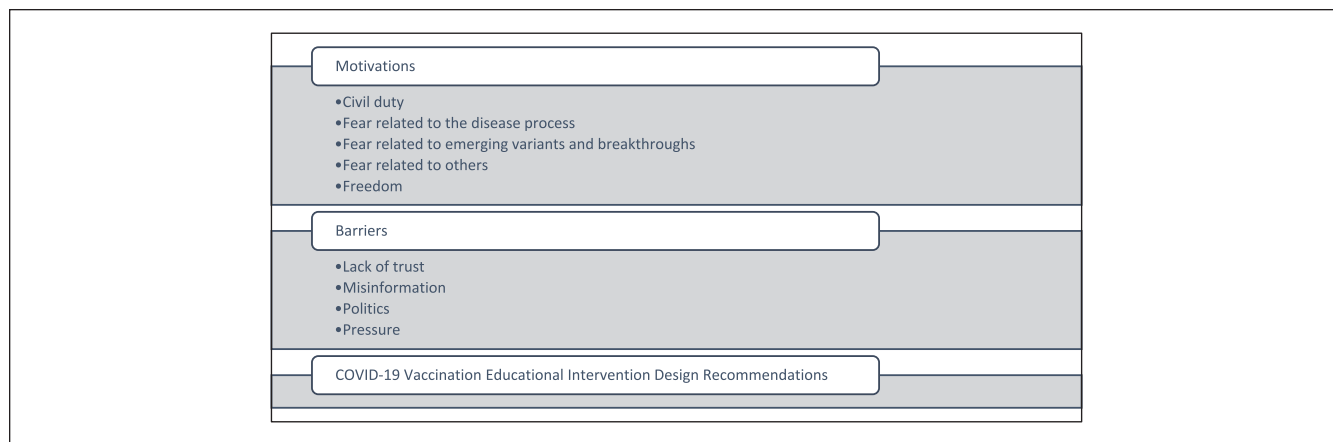


Figure 1. Focus group key themes regarding COVID-19 vaccine perspectives.

COVID-19 demonstrating limited natural immunity to the infectious disease. One participant shared,

The delta variant is rapidly multiplying among people who are not vaccinated and the statistics have also shown that percentage of people are pretty safe from vaccine and more adverse effects and the mortality rate is also very low. So, I don't see the point in fake rumors that are being spread about vaccine and the hesitancy that's surrounding them.

Participants described COVID-19 as “ever-evolving” and noted “keeping an eye” on the “uptick” in breakthrough cases at the time of the focus groups were conducted. These illustrative quotes demonstrate that fear of new, emerging variants of COVID-19 and breakthrough cases served as motivation for vaccination in U.S.-based young adults.

Theme 1.4. Fear regarding suffering of others. The fourth motivating factor influencing COVID-19 vaccination behavior in U.S.-based young adults was fear of others contracting COVID-19 and suffering from symptoms and/or death related to COVID-19. This theme describes the desire to prevent illness and death in others after witnessing such outcomes in the lives of individuals within their communities. One participant shared,

A couple weeks into [COVID-19] my best friend's father passed away from COVID. He was on the ventilator for three days on and they unfortunately had to pull the plug on him. So, I think just kind of seeing the toll that that took on my best friend . . . and her mom and her kind of having to deal with that it really it just showed me like this, this virus does not choose people. This virus has swept us as humanity and it's just kind of it blows my mind that people still think this is a hoax; that there are areas of individuals who still don't believe in the science still don't believe in the studies and still don't believe frankly humans and each other.

Another participant recalled that,

[A personal contact] didn't have the COVID effects that much, but he affected their family, the saddest part is that all of them are dead, when the he's the only guy in his family, he who is still alive . . . Just made me realize that even though I don't trust the vaccination . . . taking that might avoid a little bit of that so I just don't want to . . . be on the wrong side when everything goes right.

The idea of vaccinating oneself against COVID-19 to decrease concerns around symptoms and death in others was a contributing and motivating factor in the behaviors of the young adults interviewed in this study.

Theme 1.5. Freedom. The fifth motivating factor influencing COVID-19 vaccination behavior in U.S.-based young adults was freedom. The theme of freedom describes the desire to return to normal life where the concerns of contracting COVID-19 are no longer a barrier to socialization and the activities of daily living. This theme was described extensively by the focus group participants. One young adult shared,

Instead of that fake portrayal is honesty and just like you know someone who's my age sitting down being like do you want . . . to go out to bars and have fun and like live you're young? Because . . . a lot of us are like being robbed of some of our younger years and, like that pisses us off, so if you're like . . . Do you want to have all of these privileges that have been taken away from you, because of this disease? Then you should get the vaccine. But I think that that's something that is honest and it grabs people's attention because they're like 'yeah 'm f*cking tired of this sh*t.

Another participant shared,

For me, a lot of my family also live in different states so in order to travel on planes . . . one thing that I told myself that I would do is first get vaccinated before I started traveling on planes again just because I thought I would be a bit more protection. So

one reason was definitely to see family and friends that were located far away.

The young adults expressed strongly that the ability to have their freedom back post-COVID-19 vaccination strongly motivated their vaccination decision.

Barriers to COVID-19 vaccination. Within barriers, four sub-themes emerged: (2.1) lack of trust, (2.2) misinformation, (2.3) politics, and (2.4) pressure.

Barriers: Lack of trust. Several subthemes related to a lack of trust were identified: (2.1.1) adverse effects of COVID-19 vaccine, (2.1.2) historical and contemporary trauma, (2.1.3) COVID-19 vaccine and fertility, (2.1.4) COVID-19 vaccine and underlying conditions, and lastly (2.1.5) vaccine development process and fast timeline.

Lack of trust: Adverse effects of COVID-19 vaccine. Participants expressed concern about not knowing the long-term effects the COVID-19 vaccine and anecdotal stories of complications resulting from the vaccine leading to a lack of trust. One participant expressed hesitance in receiving the COVID-19 vaccine without more information about long-term effects but would consider reevaluating in the future: "I'm kind of waiting this out and seeing like long-term effects [of the COVID-19 vaccine] a couple years down the line, or you know, seeing when it's FDA approved and stuff." Whereas another participant indicated they knew someone who passed away after receiving the COVID-19 vaccine, "I heard some side effects issues, and I even [know] one a person . . . that my father knows. He was dead because of the vaccination. He got some blood clots and everything. I was really terrified."

Lack of trust: Historical and contemporary trauma. The historical trauma that people of color have experienced with research and the medical profession that have continued to contemporary times has led to a lack of trust in the medical providers who encourage them to get the COVID-19 vaccine. One participant shared,

As a Black woman, I was worried about the family members that I have and the people "that I know who don't trust medical professionals and it really takes a lot . . . to prove to some of the people that I know and care about. You know, here are the facts. Here's what you should do to take care of yourselves. So I was worried, how are you going to convince millions of people who already don't trust the medical system to take this vaccine that was just created within a year?"

Lack of trust: Concerns of complications with women's health. The women participants particularly had a lack of trust in the COVID-19 vaccine due to questions about its

impact on women's health such as leading to complications with fertility, menstruation, birth control, and blood clotting. A participant shared they had read about the vaccine affecting menstrual cycle timing, "I did read an article that said, like some people had missed their cycle and stuff like that." Another participant shared they needed more information about blood clotting issues related to the vaccine, "There's a huge thing with like blood clots and like I'm [on] birth control and stuff. I gotta like written off by my gynecologist because she like . . . towards not to get it, so I just [need] more information."

Lack of trust: Concerns of complications with underlying conditions. A lack of trust in the COVID-19 vaccine related to possible complications with underlying conditions was also a barrier with participants concerned about not having more information and research about how underlying conditions can be impacted by the vaccine. One participant stated, "I know there's no long-term studies so we don't really know, like the long-term effects that might have on people, especially with underlying conditions." While another indicated needing more time to decide what is best for them based on their medical history:

It is a really big medical decision, in my opinion and for me personally, I have an underlying condition. I have type one diabetes. I had to talk this over with my doctors and see would this be right for me at this time, or do I wait until it's fully FDA approved. People lately have jumped to conclusions and they think I'm just anti vax I'm not getting it. When in reality it's more of like I need to think this through, and if it's right for my body at this time, rather than like oh I'm just like a bad person if I don't want to get it right away.

Lack of trust: Vaccine development process and fast timeline. A lack of trust related to the vaccine development process and its fast timeline served as another major barrier preventing young adults from getting vaccination. Participants shared some of their concerns about the fast-paced vaccine development and the novelty of the technologies behind new vaccines. This significantly influenced their COVID-19 vaccine decision. One participant shared,

I thought it came out pretty fast, which was interesting, and I used to work in the medical device industry, so I'm familiar with how long it takes for things to get through the FDA. And so I thought it was pretty fast, and so I did more research into it and found out that you know they had been working on it for a pretty long time. mRNA vaccines, in particular.

Misinformation. Widespread misinformation about COVID-19 vaccines was identified as a significant barrier, leading to a reduction in vaccine uptake among participants. It is well known that false information has been produced and distributed to create fear and uncertainty around vaccines. One study participant stated,

I'm just kind of really waiting on more education, so that people who are scared on because of lack of assurance, or lack of education, feel safe when they do take their vaccine and when they do kind of make that step-in sort of ensuring their safety and the safety of others.

Politics. Political ideology was found to be another barrier leading to a reluctance to get vaccinated among young adults, as described by a participant: "I have seen that a lot of people didn't take [the] vaccine because of political reasons." Another participant shared as follows:

In terms of education, I'm just really waiting until we can make vaccines a collective solution instead of a political issue. I'm just . . . waiting on more education, so that people who are scared because of lack of assurance, or lack of education, feel safe when they do take their vaccine.

Pressure. Pressure the participants experienced was found to be a barrier to getting vaccinated. One participant stated, "If they need that incentive to get vaccinated, go for it but I feel like it kind of delegitimizes the vaccine in itself makes it almost look like bribery." Another participant shared that she wanted to make an informed decision:

[To] be completely honest [it's] too pushy. I was still getting an email at least one or two every single day saying I need to get the vaccine, I need to get the vaccine. It was a little bit frustrating, because I feel like I should have control of my decision.

COVID-19 vaccination education intervention design recommendations. For development of educational interventions on the topic of COVID-19 vaccination, the majority of study participants noted that social media would be an effective and easy way to deliver education to this population. As one participant stated, "Social media is a big tool in getting any sort of news. People are on their phone all day, so . . . [find] a way to implement it into that." Another participant also shared:

I think social media is an effective way to get eyes on it, because it's not like I was actively looking for information . . . [It] just popped up on my home screen . . . It helps for people who are like not specifically looking for the information.

Social media was found to be the important way to communicate and keep up with COVID-19 vaccine news. Participants also reported that they liked fact-based, short educational programs that were visually appealing. One participant stated:

Especially for young people, I feel like we have a really short or like a small attention span. So, if you can frame like the data or the facts [in] a visually appealing way . . .with graphs that make it really easy to see the stats and see the information. I think that's really helpful.

In addition, participants spoke to the necessity of reliable and accurate information being readily available when making vaccination decision. One participant shared,

You're trying to be just be blunt and honest when, if you made like an ad for people 18 to 24 they're gonna want to know the major side effects. They're going to want to know the effective rate. I know there's differences between the Moderna Pfizer, the JJ (Johnson & Johnson).

Another participant urged that healthcare educators and researchers must, "keep spreading good valid information about COVID."

Lastly, participants expressed that they want to hear experiences from their peers who went through COVID-19 and received COVID-19 vaccines. They really like to hear stories and taking about experiences with the vaccine and different perspectives with one participant stating that, "group talk sessions [are] really . . . really helpful. Again, like [other participant name] mentioned, [it's a] cathartic experience." Having just like being able to talk about how we felt after the vaccine or experiences that we have had with people who have like experience COVID firsthand. "I think a lot of times people listen more to their peers . . . you know." In summary, young adults who participated in the focus groups had strong feelings regarding the content and tone that would be most effective in the development of vaccination educational interventions for their age group.

Discussion

This study describes the perceptions of young adults within the age group of 18 to 24 years detailing the reports of what motivates them versus what prevents them from seeking vaccination and what would be helpful in communication in light of the current COVID-19 pandemic. The findings discovered show relationship to historical outbreaks and trends as related to previous authors; however, this qualitative focus group study is novel in its purpose of linking qualitative reactions of a particular age group to the current pandemic. As COVID-19 continues to evolve, there is no doubt that the choice to vaccinate stands to be one of the most important steps in managing the pandemic. Vaccinating a large proportion of the population is critical in achieving global immunity. Despite this fact, young adults have reported lower vaccination rates compared to any age groups. Thematic analysis of the focus group data uncovered three key themes including (1) motivating factors to vaccination, (2) barriers to vaccination, and (3) COVID-19 vaccination educational intervention design recommendations. Motivating factors had five relevant subthemes: (1.1) civic duty, (1.2) fear related to the disease process, (1.3) fear related to emerging variants and breakthroughs, (1.4) fear regarding the suffering of others, and (1.5) freedom; while barriers included four

subthemes: (2.1) lack of trust, (2.2) misinformation, (2.3) politics, and (2.4) pressure.

The COVID-19 pandemic has placed substantial pressure on young adults to change their risky behaviors and increase their responsibility to comply with civic duties. Our study found that a personal sense of civic duty, a sense of responsibility toward society (Bourgeois et al., 2020). Civic duty was representative of high concern in convincing young adults to receive vaccination for COVID-19. Most of the study participants believed that they have a moral obligation and responsibility to protect others and to act for the good of their communities. Bourgeois et al. (2020), though written in pre-vaccination era, found similar results, showing that civic duty had a strong direct correlation with how a community chooses to follow public health recommendations. This can be translational of evidence to support civic duty including vaccination recommendations during the COVID-19 crisis. Prosocial motivations, such as the positive impact of vaccination on protecting relatives and community, strongly predicted the intent to vaccinate, more so than self-protection (Bourgeois et al., 2020; Rieger, 2020). Civic duty can be an essential part of education to promote vaccination among young adults.

Fear of contracting COVID-19, regardless of being related to self and/or others, and suffering from symptoms and/or death is another motivational factor for young adults to seek vaccination. This finding is consistent with several other studies that have identified a direct association between willingness to be vaccinated and the fear of acquiring COVID-19 (Hwang et al., 2022; Sekizawa et al., 2022; Willis et al., 2021). Freedom, as a concept, has been used and interpreted differently in the literature related to COVID-19. Some believe that we preserve freedom by giving people the choice to receive the vaccine or not, whereas others, as demonstrated in our study, believe that freedom can be restored if the pandemic is controlled through global vaccination. The participants in our study believe that with vaccination, there is hope for the return to normalcy, thus restoring people's freedom to live normal lives. The desire to return to normalcy for freedom is another motivational factor for vaccination. This concept has not been well studied in the literature; thus, it is a unique contribution of our study.

A lack of trust due to unknown long-term effects of the COVID-19 vaccine and unknown underlying conditions is perceived as another major barrier to vaccination among young adults. Frank and Arim (2020) found that there is a

direct correlation between individuals with higher levels of generalized trust and a higher tendency to receive the COVID-19 vaccine once available. Akther and Nur (2022) conducted a survey of 351 participants ages 19 to 30 and found that perceived usefulness of the vaccine positively influenced vaccination acceptance. Fisher et al. (2020) also found that concern about vaccine safety is a predictor for vaccine hesitancy. Common misconceptions about vaccines in general and believing in conspiracy theories about COVID-19 vaccination are indications of a lack of trust in the vaccine. "Undecided" individuals reported that they would accept vaccination if accurate data on the safety and effectiveness of the vaccine could be provided. This finding demonstrates the importance of using scientific data to counteract biased and inaccurate information to promote trust among young adults regarding the benefits and risks of the vaccine.

Black Americans are much more likely than whites to get seriously ill and die from COVID-19, but they are less willing to take the COVID-19 vaccine. Historic and contemporary trauma experienced by Black Americans continues to foster mistrust of healthcare systems and government, serving as a barrier to vaccination acceptance (Purnell et al., 2022; Stoler et al., 2021). This absence of trust from Black Americans comes from a long history of abuse and exploitation by medical entities. Previous studies (Fisher et al., 2020; Stoler et al., 2021) have shown that being a Black American is a strong independent predictor of rejecting vaccination. This current study identified the lack of trust due to historic and contemporary trauma experienced by Black Americans as a factor that plays a role in vaccination rejection among a diverse sample. Understanding the historic nature of diverse communities and mistrust in the medical establishment will promote transparent information dissemination.

This study also found that misinformation about the COVID-19 vaccine and its development process is another deterring factor affecting young adults' vaccination decisions. False and distorted information about COVID-19 vaccines conveyed through media outlets and websites presented a strong barrier for young adults, increasing vaccine hesitancy and reducing the intention to get vaccinated (Broniatowski et al., 2020; Lee et al., 2022). Sekizawa et al. (2022) also found that social networks tend to amplify the dissemination of biases and inaccurate information. This is held to be true because many young adults acquire and share news via social networks; misinformation can spread quickly through their networks. This finding demonstrates the importance of countering

misinformation with accurate and timely information via social networks so that young adults are more informed and more likely to get vaccinated.

Young adults participating in our focus group discussions also expressed that there is a great need for more education regarding the vaccine, side effects, long-term effects, safety, and efficacy. The preferred use of social media along with short fact-based educational programs stood out as an effective strategy to help reduce infection and subsequent transmission to persons at higher risk of severe illness for this young adult population. Also, participants reported that their preference was to receive vaccine-related content and information through social media platforms, which is similar to results reported by a previous study (Khan et al., 2021). This was found to be the most beneficial way to communicate and keep up with COVID-19 vaccine news for this young adult population. Participants also reported that they would prefer that facts be shared from healthcare workers in ways that were visually appealing and from those who are peers from the same group having lived the experience of COVID-19.

Limitations. Using a qualitative design in the study, the team had no intention to generalize the results. Also, this study used a purposive sampling method to recruit the participants. Furthermore, because the participants were recruited by the use of researchers' own social networks, it leads to an inherent bias. As a result, the lack of generalizability may be viewed as a major limitation of this study. Another limitation noted was the diminished ability to recruit participants who rejected or were undecided about receiving the COVID-19 vaccination. Our research team tried to recruit diverse participants to hear their concerns. Despite our attempts, we were unable to schedule Hispanic young adults to participate in the focus groups. Lastly, individual views on the COVID-19 vaccine are ever-changing as new information is constantly released and may limit the stability of the findings.

Future research. Future studies should explore the nature and strength of the associations between the factors identified in this study as barriers and motivational factors influencing the decision to vaccinate and the actual acceptance of the vaccine by young adults. As the pandemic evolves, and more information is available regarding the concerns of the vaccine, perceptions as they relate mitigations strategies may evolve as well up to and including the removal of thoughts of political gain as rush to vaccination availability.

Quantitative studies can be designed to determine the generalizability of the findings to a larger population. Future studies can also focus on developing educational materials and distribution modalities targeting young adults based on the findings of our study which include the social media presentation of educational resources that include trusted healthcare professionals and peers with the lived experiences of COVID-19.

Implications for nursing practice. Understanding the barriers and motivational factors to vaccination status and ways to deliver the most important information in a timely manner is in critical in time of crisis. Our study provided information that gives insight as to why young adults identify as the critical elements to receive or not receive the COVID-19 vaccination. The information will be beneficial for developing customized strategies to increase motivation and mitigate barriers which include the mobilization of educational strategies, trusted healthcare professionals, and the support of a community of individuals who have the experience to deliver keywords/phrases and known facts at specific times so that there can be prioritized in addressing vaccination hesitancy among young adults. Our findings help identify education measures targeting high-risk young adults with vaccine hesitancy. Nurses need to be educated on how to address the concerns related to vaccine information and increase trust. As the most trusted professionals, nurses are well positioned to disseminate accurate information and rectify misinformation.

Conclusion

This study found that perceived fears of getting infected, deaths of friends and family, and pandemic-related loss of freedom contributed to young adults' willingness to get vaccinated. However, the participants reported that barriers such as lack of trust in terms of adverse effects of the COVID-19 vaccine, historical and contemporary trauma, and unknown underlying conditions served as key factors behind the reluctance to get vaccinated among this high-risk population. Findings suggest that social media can serve as an aid in the development of educational interventions targeting motivations and barriers, which is vital. Our research team concluded that for this young adult population, urgent COVID-19 vaccine education needs to be delivered in a way that is more widely and easily accessible to this population, ultimately promoting positive health behaviors.

Appendix A

Table A1. GenCOVID Focus Group Discussion Guide.

Major health belief model concepts guiding discussion questions	Questions
Perceptions Perception of COVID-19 vaccine	<ol style="list-style-type: none"> 1. Tell us about your experience beginning with when you first learned of the COVID-19 vaccine. 2. How do you feel about the COVID-19 vaccine in general? 3. What are the reasons why you decided: <ol style="list-style-type: none"> a) to get vaccinated b) not to get vaccinated c) undecided to get vaccinated 4. How do you feel about personally getting the COVID-19 vaccine? <p>What has been the biggest influences in your decision to vaccinate or not vaccinate for COVID-19?</p>
Cues to action Development of education intervention: Informational content and preferred learning methods	<ol style="list-style-type: none"> 1. Have you currently searched for COVID-19 vaccine related information? <ol style="list-style-type: none"> (a) If so, what sites or platforms, did you search for this information? (b) If so, what information did you search for? 2. Which source was the most useful in explaining the COVID-19 vaccine? 3. What COVID-19 vaccine education strategies do you find most effective in relaying information? 4. What informational content do you think would be important to include in a COVID-19 education program? 5. What method do you think would be the most effective in delivering COVID-19 vaccine information to young adults? <p>Closing question: Finally, please share any final thoughts related to what we discussed today.</p>

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ORCID iD

Young-Me Lee  <https://orcid.org/0000-0002-1100-3886>

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Author Biographies

Dr. Young-Me Lee is both professor and Vincent de Paul Professor, one of 32 DePaul faculty honored in the prestigious Society of Vincent de Paul Professors. She has focused her research on active engagement in community-based preventive health to address emerging public health issues nationally and globally. With a particular focus on underserved minority and immigrant populations, she has worked tirelessly to identify health disparities and create interventions to ameliorate the impact of disease in these vulnerable communities.

Dr. Shannon D. Simonovich is an associate professor at DePaul University in Chicago, Illinois. Dr. Simonovich's mixed methods program of research focuses on addressing increasing health equity in at-risk and marginalized populations. Her research has been

supported by several interdisciplinary mechanisms including federal, foundation-based, and international funding agencies.

Dr. Suling Li is a professor in the School of Nursing at DePaul University. Her research focuses on scale development, women's health and graduate students success.

Lily Amer has a bachelor's degree in Health Sciences with a concentration in Public Health. Her research interests include nurses' responses to the COVID-19 pandemic, COVID-19 vaccine interventions as well as maternal and child health with a focus on vulnerable populations.

LeAnne Wagner is a professional lecturer in the DePaul College of Computing and Digital Media (CDM). Her research focuses on the application of human centered design methodologies to create more ethical, equitable, and efficient solutions. She is the director of PUSH Studio, an interdisciplinary design studio that focuses on the intersection of human centered design and emerging technologies.

Janet Hill's research focuses on experience design as applied to social impact project.

Dr. Roxanne Spurlark is an assistant professor and the associate director for the Doctor of Nursing Practice Program in the School of Nursing at DePaul University. Her program of research focuses on advocacy during COVID-19 for nurses and resilience in a post COVID-19 world for nurses and patients alike. She partners with interdisciplinary teams of scholars to support the translation of practicing nurses into a practice that continues to impact patient outcomes in positive nature for underserved communities.

Dr. Elizabeth Aquino is a clinical associate professor and Associate Dean for Academic Affairs in the College of Nursing at the University of Illinois at Chicago. She has focused her research on examining health disparities among vulnerable populations, particularly preventable illnesses such as cardiovascular disease, sexually transmitted infections, and COVID-19. This area of research is aligned with her community service to ensure there is access and equity of health resources for at risk and underserved communities.