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A qualitative assessment of the needs and attitudes towards COVID-19 vaccination among young adult residents of southwest Georgia

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By

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Bachelor of Arts
American University
2019

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An abstract of
A thesis submitted to the Faculty of the
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Abstract

A qualitative assessment of the needs and attitudes towards COVID-19 vaccination among young adult residents of southwest Georgia

By Simonne Vincent

Background: Vaccination for the 2019 coronavirus disease (COVID-19) has been widely available in the United States. However, many young adults are refusing to get vaccinated, especially in rural areas like southwest Georgia. COVID-19 vaccination is imperative to lower the spread of the disease and end the pandemic. Limited research has yet to qualitatively examine the needs and attitudes towards COVID-19 vaccination among young adults.

Research Objective: This study examines the needs and attitudes towards COVID-19 vaccination among young adults in southwest Georgia aged 18-35 years.

Method: In-depth, semi-structured interviews were conducted with 20 southwest Georgia residents between the ages of 18 and 35 years. Interviews were conducted over the phone and were then transcribed verbatim. The transcripts were coded by the primary coder with a secondary coder reviewing those codes to establish a standard of reliability for qualitative analysis. Themes were identified and matrices were used to identify patterns among participants, and by race and education level.

Results: The majority of participants were vaccinated and had very positive views towards the COVID-19 vaccines but reported being concerned about the vaccines' long-term effects. Participants were encouraged to get vaccinated by close relatives or friends who were also vaccinated or viewed it favorably. Convenient and accessible vaccination sites made vaccination uptake easier for most participants. Participants also shared those who were most vaccine hesitant were young adults compared to older adults who are more trusting towards the vaccine. Participants generally shared that information about the vaccines should be provided by local organizations or community leaders. Personalized vaccine messaging was viewed more favorably by participants compared to more scientific or statistics-based messaging.

Conclusion: This study suggests that the successful promotion of COVID-19 vaccination is heavily dependent on the views and behaviors of close friends of families and the level of trust in sources of information. Targeting vaccination information to young adults' social circles through social media and local community organizations/leaders can increase COVID-19 vaccine trust, limit misinformation, and improve the vaccination rate among young adult rural residents.

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Introduction

The coronavirus 2019 (COVID-19) pandemic impacted the economy, livelihood, and health of many people across the nation and around the world. The United States accounts for nearly a fifth of total global COVID-19 cases and a seventh of the world's COVID-19 deaths (Centers for Disease Control and Prevention [CDC], 2021b). Over the course of the COVID-19 pandemic, multiple variants have emerged including the Delta and Omicron Variant. The Delta variant, which was the dominant variant during the data collection phase of this study, has caused more infections and is transmitted faster than the original strain that causes COVID-19. The subsequent Omicron variant, which emerged in late November 2021, is reported to spread more easily than all other variants, including Delta (CDC, 2021a). Vaccination is imperative to reduce the adverse effects of infection and reduce transmission risk (D'Souza & Dowdy, 2021; Moghadas et al., 2021). As of October 2021, only 56.4% of the U.S population was fully vaccinated against COVID-19 (CDC, 2021b). During At that same period, only 38.5% of young adults between the ages of 20 and 34 residing in the rural, southwest region of Georgia had received one dose of the COVID-19 vaccine (Georgia Department of Public Health [GDPH], 2021). Those who live in rural areas, identify as Black or African American, and those who are young are less likely to be vaccinated (Callaghan et al., 2021; Pingali et al., 2021).

Vaccination hesitancy toward the Human Papilloma Virus (HPV) and the influenza vaccine among young adults has been reported in numerous studies (Bednarczyk et al., 2015; Britt & Englebert, 2018; Manhart et al., 2011; Rahman et al., 2015; Shon et al., 2021; Thompson et al., 2019). Attitudes towards these vaccines among young adults include the low perceived risk of contracting the disease, low social approval to getting the vaccination, and being 'too lazy' to get vaccinated. Additionally, young adults have reported barriers such as time

constraints, limited income, no health insurance, and limited knowledge of the vaccines (Bednarczyk et al., 2015; Dibble et al., 2019; Shon et al., 2021). However, few studies have qualitatively examined young adults' perceptions, beliefs, and intentions toward COVID-19 vaccination uptake in the United States, particularly among residents of rural southwest Georgia.

The Theoretical framework of this assessment is based on the Integrated Behavioral Model (IBM) and the 5C model of psychological antecedents to vaccination uptake. The Integrated Behavioral Model demonstrates that an individual's perceived norms (others' expectations and behaviors), attitudes towards a behavior (feelings and beliefs about the behavior), and personal agency (self-efficacy and perceived control) dictate one's intention to perform a behavior (Montano & Kasprzyk, 2015). In addition, the IBM uniquely includes constructs such as environmental constraints, the salience of the behavior, habit, and knowledge of skills needed; all of which directly impact performing a behavior. The 5C model of psychological antecedents specifies the individual-level psychological concepts that motivate vaccination uptake, including an individual's sense of confidence in the effectiveness of the vaccine, the level of complacency in perceived disease risk, the constraints or barriers to accessing vaccines, their calculation or research on the vaccine, and their level of collective responsibility (Betsch et al., 2018). By utilizing this framework, the purpose of this study is to assess the beliefs, norms, attitudes, and needs of young adult residents of southwest Georgia towards COVID-19 vaccination aged 18 to 35 years.

Research questions that will be assessed are the following:

- What are the attitudes and beliefs towards COVID-19 vaccination?
- What are the perceived social norms towards COVID-19 vaccination?
- What are the constraints, barriers, and facilitators to COVID-19 vaccination?

- What are the most effective messaging strategies to promote COVID-19 vaccination?

Vaccination uptake has been a common issue in public health before and outside of the COVID-19 pandemic. Studies examining vaccination hesitancy towards HPV, influenza, and other vaccines have examined hesitancy through racial, geographical, and political lines (Daley et al., 2017; Hausman et al., 2020; Quinn et al., 2017). The COVID-19 pandemic has made salient the issues concerning national public health responses. This current research explores the psychological, social, and systemic factors and needs that influence vaccination uptake in hopes that future implementation of health and/or vaccination services are equitably accessed, and that communication of vaccine information and services are appropriate to the targeted population.

Definitions of Terms

COVID-19 (a coronavirus discovered in 2019) is a disease that commonly affects the respiratory tract and is caused by SARS-CoV-2.

SARS-CoV-2 refers to severe acute respiratory syndrome (SARS) which is caused by a coronavirus (CoV). This virus causes respiratory illness resulting in infected people having the COVID-19 disease.

Vaccination hesitancy refers to putting off or refusing to get vaccinated despite the availability and access to vaccination services (MacDonald, 2015).

Literature Review

Morbidity and Mortality due to COVID-19

COVID-19 in the United States and Georgia

As of Early October 2021, the United States had around 44 million total cases with over 715,000 deaths due to COVID-19 (CDC, 2021b). Those who were between the ages of 18 and 29 years and those between the ages of 30 and 39 years make up 22.2% and 16.6% of total cases respectively, combining for a total of 38% of cases in the United States. However, these age groups make up less than 3% of deaths while those over the age of 50 make up over 94% of total deaths due to COVID-19 (CDC, 2021b; Elfein, 2021a, 2021b). Around this time, the state of Georgia had around 1.25 million total cases and almost 25,000 confirmed total deaths. COVID-19 cases among those between 18 and 39 years of age make up more than 38.3% of cases, but less than 3% of deaths compared to those older than 40 years of age who make up 46% of cases and 96% of deaths (Georgia Department of Public Health, 2021).

Disparities in due to COVID-19

COVID-19 infections are higher among those who are Black and/or Hispanic. Hispanics account for 25% of cases although making up only 18.45% of the population. Furthermore, Black Americans make up around 13.8% percent of COVID-19 deaths while accounting for 12.5% of the U.S population (CDC, 2021b). Studies have found that U.S counties with a majority Black and Hispanic adult population have higher COVID-19 cases and deaths (Figueroa et al., 2021; Khanijahani, 2021). People who live in counties with a small population, higher poverty rate, and less than a high school education are more likely to have a higher mortality rate due to COVID-19 (Abedi et al., 2021). Rural areas had fewer COVID-19 cases at the start of the

pandemic, but by December 2020 rural areas had more infections per 100,000 adults compared to urban areas (Dobis & McGranahan, 2021). Vulnerability to COVID-19 is also determined by older age, difficulty in accessing medical care, and living more than 30 miles away from a county with an intensive care hospital (Davoodi et al., 2020; Dobis & McGranahan, 2021). In addition, those who have underlying medical conditions are also at increased risk of infection and mortality. Many rural residents live in areas experiencing these vulnerabilities with a quarter of rural residents living in counties where underlying conditions cause higher rates of mortality (Dobis & McGranahan, 2021). Furthermore, a study examining the clinical profile of young adults aged 18 to 34 years who have been admitted to hospitals for COVID-19 between April and June 2020 has found that morbid obesity and hypertension were common conditions and were associated with a greater risk of death (Cunningham et al., 2021).

Similar disparities have been found in the state of Georgia. At the beginning of the pandemic, many southwest counties experienced a high number of severe cases and deaths. For example, Dougherty County, which resides in the southwest region of Georgia, experienced the second-highest number of cases in the state despite having a population of 85,000 compared to Fulton County—which includes the city of Atlanta—which has a population of almost 1 million (Chavez et al., 2020). An investigation of COVID-19 disparities in clinical outcomes at Kaiser Permanente Georgia found that Black and Hispanic patients are at higher odds of hospitalization compared to other racial/ethnic groups. It also concluded that comorbidities like hypertension and social demographic factors such as living in low employment areas are also associated with hospitalization (Lobelo et al., 2021). These findings are also reflected in Georgia which saw that COVID-19 cases and deaths were significantly associated with counties in southwest Georgia and counties with a higher percentage of adult Black populations (Baltrus et al., 2021).

Long-term effects

While the long-term effects of COVID-19 are currently being studied, it continues to be difficult to know the long-term effects of the disease. Predicted long-term effects from COVID-19 include pulmonary, central nervous system, cardiovascular, and psychosocial manifestations as well as post-intensive care syndrome (PICS) (CDC, 2021g; Higgins et al., 2021). PICS may include problems with decision making, weakness, and post-traumatic stress disorder (PTSD). In addition to PTSD, other psychiatric effects can include anxiety and/or depression and diminished sleep durations (Poyraz et al., 2021). Patients may also experience lower exercise capacity, increased cardiovascular disease risk, and neurological consequences which are concerning given the burden of low neurological functioning among older age groups (Higgins et al., 2021). Organ damage to the lungs, heart, kidneys; problems with blood clots and blood vessels, distorted sense of smell, and taste may also occur after COVID-19 infections (Chung et al., 2021; Mayo Clinic, 2021).

Vaccination Rates for COVID-19

Available Vaccines and Effectiveness

In December 2020, vaccines from Moderna and Pfizer-BioNTech were approved for emergency distribution for healthcare workers and those who were over the age of 75 years. In February 2021, the Johnson & Johnson (Janssen) COVID-19 vaccine was approved for emergency use for eligible age groups. The U.S Food and Drug Administration (FDA) approved Pfizer-BioNTech, vaccines in August 2021 (U.S Food and Drug Administration, 2021). By November 2021, vaccine eligibility expanded for everyone in the United States aged 5 years and older (CDC, 2021d). Side effects from COVID-19 vaccinations include pain, redness, and

swelling in the arm where the shot was administered. Other side effects may include tiredness, headaches, muscle pain, chills, fever, and nausea (CDC, 2021f).

The CDC reports that the vaccines are less effective at preventing COVID-19 infection in fall 2021 compared to the first five months of 2021. This is likely due to the Delta variant that had become dominant in the summer of 2021. However, the vaccines have still shown to be effective at protecting individuals from being hospitalized with COVID-19, this includes protection against the Delta variant (CDC, 2021b). Booster doses for all three vaccines began to be recommended in the fall of 2021. Those who are aged 18 years and older are eligible to receive the Pfizer-BioNTech and Moderna booster shot at least 6 months after receiving the primary series. Recipients of the Johnson &Johnson vaccine for the primary series are recommended to receive a booster dose at least 2 months after the first dose (CDC, 2021c).

United States vaccination rates

As of Early October 2021, approximately 56% of the U.S population has been fully vaccinated against COVID-19 (CDC, 2021b). Fifty-four percent of adults aged 18 to 24 and 58% of adults between ages 25 and 39 years were fully vaccinated. Disparities in COVID-19 vaccination have been shown across sex, racial, and geographical lines. At this time, women had a higher vaccination rate compared to men with 59% of U.S women vaccinated and 55.0% of U.S men (CDC,2021b). While rural areas are likely to be vulnerable to the effects of COVID-19, rural areas still had lower vaccination rates compared to urban areas (Murthy et al., 2021). Furthermore, Black Americans had the lowest percentage of people who are fully vaccinated at 34.1%, compared to 43.1% of White Americans and 49.8% of Asian Americans (CDC, 2021b)

Georgia vaccination rates

In Early October 2021, 48.3% of Georgian residents were fully vaccinated against COVID-19 (GDPH, 2021). Fifty percent of young adults aged 20 to 34 received at least one dose of the COVID-19 vaccine. Black Georgian residents have the lowest percentage of vaccination (45%) compared to 47.5% of White Georgians and 81% of Asian Georgians. Despite the high mortality rates and cases that occurred at the beginning of the pandemic, only 42.8% of residents in rural southwest Georgia were fully vaccinated (GDPH, 2021). Young adults have been found to have a lower vaccination rate. Thirty-eight percent of residents between the ages of 20 and 34 years received at least one dose of the vaccine (GDPH, 2021). With the SARS-COV-2 virus still being transmissible even among those who are vaccinated, the U.S and Georgia must achieve a higher rate of vaccination (D'Souza & Dowdy, 2021).

General Vaccination Hesitancy among Young Adults

Studies that have examined vaccine intention and hesitancy toward vaccines for other viruses have demonstrated that many behavioral, social, and external factors influence vaccination uptake and refusal among young adults. A qualitative study that examined the attitudes towards the Human Papilloma Virus (HPV) among women in metropolitan Seattle has shown that women who had low perceptions of HPV susceptibility have low peer approval of the vaccine. Furthermore, those who were not considering vaccination were less likely to believe that the vaccine was effective and less likely to initiate vaccination (Manhart et al., 2011). Similarly, a study evaluating the barriers among young adult and adolescent males found that social norms and rules of behavior that inform a group or community were are barriers to HPV vaccination uptake in addition to misinformation, lack of education, and lack of communication about the virus and its vaccine (Dibble et al., 2019). External determinants also include income, vaccination costs, insurance coverage, and regularity of medical checkups (Rahman et al., 2015;

Thompson et al., 2019). In addition to these attitudes, college students in rural areas may be influenced by subjective norms (one's perception of how others feel about whether or not one should engage in a behavior) and school and work demands (Britt & Englebert, 2018).

Studies examining young adult influenza vaccination uptake have also demonstrated similar results. A systematic review summarizing components that influence university students to get the flu vaccine shows that positive attitudes, such as higher perceived benefits from the vaccine, increased knowledge about the vaccine, and high self-efficacy can increase vaccination intention (Shon et al., 2021). Low vaccination uptake among college students is also influenced by attitudes such as being "too lazy" to get vaccinated (Bednarczyk et al., 2015; Shon et al., 2021).

Theoretical Framework

The Integrated Behavioral Model is an expansion of the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB) and an attempt to build consensus on key constructs and their relationships across individual-level theories. The TRA/TPB model states that behavior is not only determined by intention, but also by attitudes, subjective norms, and perceived behavioral control (Eldredge et al., 2016; Montano & Kasprzyk, 2015). In addition, subjective norms about what others think the person should do and the person's perceptions of the actions of others also influence a person completing a behavior. Lastly, having personal agency, which includes self-efficacy and perceived control, also factors into health behavior (Montano & Kasprzyk, 2015). Building off the TRA/TPB models where attitude, perceived norms, and personal agency impacts intention to perform a behavior, which in turn, leads to performing the behavior, IBM also includes constructs such as skills and knowledge, habit, and environmental constraints which can all directly impact performing a behavior. Knowledge of

behavior is important and necessary if one were to carry out a behavior. Prior experience performing the behavior may make it habitual which oversteps the intention stage and directly impacts behavior. In addition, one experiencing little to no environmental constraints is more likely to perform a behavior. These constructs from IBM help inform health behavior and the constructs presented in this model align with other theories related to vaccination hesitancy and vaccine decision-making. The IBM construct of perceived behavioral control and environmental constraints is comparable to the construct of constraint in the 5C model of psychological antecedents of vaccination which captures availability, affordability, and other structural and psychological barriers affecting vaccination uptake.

The Strategic Advisory Groups of Experts on Immunization (SAGE) workgroup that advises the World Health Organization (WHO) on overall policies and strategies on vaccine delivery has defined vaccine hesitancy as "the delay in acceptance or refusal of vaccination despite the availability of vaccination services" (MacDonald, 2015). Vaccination uptake is influenced by factors also known as the 3Cs which are complacency, convenience, or confidence (MacDonald, 2015). This model was expanded by Betsch and colleagues (2018), focusing less on the construct of 'vaccine hesitancy,' but rather on examining the psychological antecedents of vaccination and adding 'calculation' and 'collective responsibility' to the original 3Cs. In addition, this model reconstructs 'convenience' to be 'constraints'.

The antecedents to the model include confidence which refers to the trust in the safety and effectiveness of vaccines, the policymakers who decide they are needed, the competence of healthcare professionals, and the systems that distribute and deliver them. Complacency refers to when there is a low perceived risk of disease, therefore a vaccine is not needed. Constraints refer to when physical access, availability, geographical accessibility, and the ability to understand

language affect the uptake of vaccination. Calculation refers to an individual's extensive search for and engagement with information on vaccines. Lastly, collective responsibility is the willingness to get vaccinated to protect others by herd immunity (Betsch et al., 2018). Overall, vaccine decision-making is a complex process that is affected by socio-cultural contexts that involve social processes, past health care experiences, perceptions of risk, and social norms (Brewer et al., 2017; Dubé et al., 2013).

These models have been used in many studies investigating vaccine acceptance and uptake. A study investigating the impact of the COVID-19 pandemic on perceptions of vaccination intention among adults between 18 and 49 years of age used Betsch and colleagues' 5C scale. Those who scored higher on the scale were accepting of vaccination (Mercadante & Law, 2021). Another study used this same scale to examine COVID-19 vaccine acceptance among healthcare workers in Kuwait and found higher collective responsibility and low levels of calculation and constraint among healthcare workers (Al-Sanafi & Sallam, 2021). The IBM has been used in both quantitative and qualitative studies. In a qualitative study addressing the reasons young adult women decline the HPV vaccination, the IBM was used to develop the interview guide and codebook as a framework to collect and analyze captured data (Mills et al., 2013). A quantitative study examining the attitudes towards influenza vaccination in rural adolescents has used the IBM in conjunction with the Health Belief Model (HBM) to develop their survey where the IBM constructs of perceived behavioral control and injunctive and descriptive social norms were evaluated among study participants (Painter et al., 2010).

COVID-19 Vaccination Hesitancy

In recent studies that have examined COVID-19 vaccine hesitancy and acceptance in the United States, concerns about the vaccine, the development process, and vaccine effectiveness

have emerged. Studies examining attitudes toward COVID-19 vaccination acceptance have reported concerns about the side effects of the vaccines and the limited amount of time in development testing (Pogue et al., 2020). In a qualitative study examining vaccine hesitancy in the U.S by employment and occupation categories, it was found that these concerns among those who are hesitant about the COVID-19 vaccines are more common than those who have a distrust of vaccines in general. In addition, potential side effects, distrust of the government, beliefs that the vaccinees are not needed, and waiting to see if the vaccines were safe were among the reasons to not partake in COVID-19 vaccine uptake (King et al., 2021).

Research examining the attitudes towards COVID-19 vaccinations among healthcare workers (HCWs) from two hospital systems in New Mexico found that most HCWs were in favor of receiving the vaccine, but some reported personal distrust of information received from healthcare, public health, and medical professionals. Furthermore, healthcare workers who identify as black, have a low perception of COVID-19 risk, and those who lived in rural settings had a lower acceptance of the vaccine (Shekhar et al., 2021). This is similar to an Arkansas study that found that those who are younger, Black/African American, or were in low-income brackets had a lower vaccine acceptance compared to those in higher income brackets, and those who are older and identify as White (Willis et al., 2021).

Young adults have also reported hesitancy toward the COVID-19 vaccines. In examining the attitudes of young adults towards COVID-19 vaccination intention, reasons for vaccine refusal include a lack of trust in the vaccines, not believing that vaccines are necessary, concerns about experiencing side effects, and waiting to see if the vaccines are safe. Those who intended on getting vaccinated indicated that the vaccines were safe, that they would prevent COVID-19 from spreading, and that it would have their social life return to a sense of normalcy (Baack et

al., 2021). In June 2021, the CDC conducted a national survey and concluded that vaccination uptake and vaccination intention was the lowest among adults aged 18 to 39 years of age. Similar to other studies, the safety and effectiveness of the vaccines are a major source of concern for those who have a low intention of vaccination (Baack et al., 2021). Many studies have examined attitudes towards COVID-19 hesitancy and acceptance among general groups and healthcare workers, however, there are a limited number of studies that qualitatively examine the perspectives, experiences, and beliefs of young adults toward the COVID-19 vaccines, and more so, there are few qualitative studies examining this population in rural southwest Georgia. This study will define young adulthood as ages 18 to 35 years based on previous studies on vaccination attitudes and uptake among young adults that studied this specified age range (Kumari et al., 2021; Machalek et al., 2018; Trzebiński & Trzebiński, 2022). Therefore, the goal of this study is to assess the needs and attitudes towards vaccination uptake among young adult residents of southwest Georgia aged 18 to 35 years of age. This assessment will explore the social influences, community norms, information needs, and messaging strategies of young adults in southwest Georgia, as well as the barriers and facilitators many young adults face in accessing vaccinations.

Methods

From July 2021 to October 2021, semi-structured telephone interviews were conducted with young adult residents of southwest Georgia assessing their thoughts and attitudes towards the COVID-19 vaccines in addition to assessing their current information needs, challenges, and facilitators that are affecting COVID-19 vaccination uptake.

This research was conducted alongside a broader needs assessment examining vaccine uptake among African American rural residents of southwest Georgia conducted by the Emory Prevention Research Center (EPRC). Working concurrently with the EPRC, this research utilized an already developed interview guide and partnered with the EPRC's existing Community Advisory Board (CAB). In March of 2021, CAB members asked the EPRC to assist them in encouraging vaccine uptake in the region. The EPRC responded by conducting a community assessment using a web-based survey, followed by qualitative interviews of priority groups, including conservative rural residents, lower-income African Americans, and young adults. A CAB workgroup was also formed to guide the assessment. In May 2020, the CDC gave the EPRC supplemental funds to design, conduct, and evaluate an intervention to increase vaccination in the region called 'VaxUp Southwest Georgia!', which also allowed for expansion of the original community assessment and workgroup. This current research did not require an Institutional Review Board approval operates as a continuation of an ongoing needs assessment.

Population and Sample

Eligible participants were young adults aged 18 to 35 years who lived in one of the 24 counties that make up the EPRC's catchment area in southwest Georgia. These counties include Baker, Brooks, Calhoun, Clay, Colquitt, Cook, Crisp, Decatur, Dougherty, Dooly, Early, Grady,

Lee, Miller, Mitchell, Quitman, Randolph, Seminole, Sumter, Terrel, Thomas, Tift, Turner, and Worth. Both vaccinated and unvaccinated individuals were eligible to participate in the current research study.

The original community assessment by the EPRC took place between June and August of 2021 and recruited Black/African American residents of southwest Georgia. They also sought to include young adults, but only were able to recruit three participants under the age of 35. This current study utilized these three participant interviews and supplemented them with an additional 17 participants for a total of 20 participants.

A purposive sampling approach was used to recruit participants with the intent to recruit young adults living in southwest Georgia. Flyers were disturbed in person and via social media which stated all inclusion criteria and participation incentives. Recruitment occurred through CAB members distributing flyers to universities and schools in southwest Georgia, as well as through their social and personal networks. Recruitment also occurred through social media advertising, specifically Facebook and Instagram which targeted young adults aged 18 to 35 in the southwest Georgia region. All participants were gifted a $30 Amazon or Walmart gift card for their time and participation.

Study Design

This assessment involved 20 semi-structured interviews (17 newly conducted and 3 from the initial assessment) to better understand vaccine hesitancy and uptake among young adults in southwest Georgia. Except for the three interviews conducted by the EPRC team, the remaining 17 interviews were conducted by the main researcher for this current study.

This research utilized the EPRC's interview guide that was developed for its needs assessment. The interview guide is based on the Integrated Behavioral Model focusing on the knowledge about the COVID-19 vaccines, subjective norms of other people's thoughts and actions towards the vaccine, and personal agency to get vaccinated (Montano & Kasprzyk, 2015). Questions were also adapted from CDC's vaccine uptake interview guide (CDC, 2021e). The interview guide (Table 1) transforms and operationalized these constructs into six main topic areas: general views on the vaccines, social influences, community norms, logistics of getting the vaccine, information needs, and feedback on specific messages/strategies. The interview guide was reviewed by the VaxUp Southwest Georgia team and the CAB workgroup. The interviews took between 30 and 45 minutes to complete.

Table 1 Interview Guide

Constructs	***General views on the Vaccine***
Experiential Attitude (IBM)	What do you think about the COVID-19 vaccine?
Instrumental Attitude-Positive (IBM)	What are some of the good things that could/are result[ing] from you getting the vaccine?
Instrumental Attitude-Negative (IBM)	What are some of the potential downsides of you getting the vaccine? Probe: what are/were you worried about? ONLY ASK IF NOT PLANNING TO GET VACCINATED SOON: Why don't you plan to get it right away or at all?
	Social Influences
Injunctive Norm-Positive (IBM)	Think about people in your life, who is encouraging/encouraged you to get the vaccine? What are they saying/did they say? How much do you listen to them?
Injunctive Norm-Negative (IBM)	Who is/was against you getting the vaccine? What are/were they saying? How much do you listen to them?
Descriptive Norm (IBM)	In general, are your friends and family members getting the vaccine? What are some of the reasons they are/are not getting the vaccine?
	Environmental Constraints

Perceived Control (IBM) **Constraints (5Cs)**	What are/were some of the logistical or other barriers you face/d in getting the vaccine?
Perceived Control (IBM)	What would make it easy/what made it relatively easy for you to get the vaccine?
	Information Needs
Calculation (5Cs)	What information do you and others still need about COVID-19 vaccination? Probe: What would help you feel better about getting the vaccine?
	Feedback on Specific Messages/Strategies
Collective Responsibility (5Cs)	We'd like to know your reactions to some specific messages about the vaccine. For each statement, let me know whether you think that message would convince you and your family/friends to get the vaccine, and why or why not. a. It is important to get the vaccine to prevent the virus from spreading. b. Getting the vaccine helps the U.S. develop herd immunity. c. Getting the vaccine helps to keep schools and businesses open. d. Getting the vaccine decreases the chance of dangerous new variants which might be more contagious, more deadly and/or harm younger people. e. Getting the vaccine protects older people in your life from getting sick and dying from COVID-19

Data Collection Procedures

Semi-structured telephone interviews (n=17) were carried out between July and October 2021 by the primary researcher. Eligibility criteria including age, vaccination status, and county of residence were verified for each participant before commencing the interview. All interviews were recorded using Google Voice voicemail and an audio recorder. All interview recordings were kept secure behind password-protected cloud drives. After informing all participants on the topic of the interview, their agency during their interview, and the privacy and confidentiality measures; verbal consent was obtained from each participant both for interview participation and for voice recording. Demographic characteristics including race, education achievement, and political affiliation were collected at the end of each interview.

Data Analysis Methodology

The interviews were transcribed verbatim by a professional transcription service. The current study utilized the codebook developed by the EPRC to capture major themes from the topic areas discussed in the interviews. The framework for analysis was both deductive and inductive. Betsch and colleagues' (2015) 5Cs model of psychological antecedents of vaccination and the Integrated Behavioral Model (IBM) were the basis of the codebook and the overall framework of analysis. This includes examining themes under competency, complacency, constraints, calculation, and collective responsibility. Analysis also includes themes surrounding individual attitudes, social influences, community norms, perceived control, knowledge needs, and reasons for vaccine uptake or refusal, although emerging themes outside of this framework were also allowed and identified.

Individual or instrumental attitudes analyzed the participants' perceptions of positive and negative outcomes of getting the vaccination. The social influences area examined who encouraged and discouraged the participants to receive the vaccine and who in the participants' social circle was getting the vaccine. The community norms theme included participants' perceptions of which social groups (i.e age, racial, gender, political, etc.) were vaccine confident and vaccine hesitant. Perceived control included areas in which the participants experienced environmental constraints and facilitators that made it easier or harder to receive the vaccine. Perceptions of trusted information sources and additional information needed to promote vaccination uptake were also analyzed with a focus on examining the level of trust with governmental and health organizations. In addition, participants also evaluated the level of effectiveness of multiple messaging strategies.

Coding was performed using MaxQDA (version 2020). To ensure a level of reliability, based on the framework of the codebook, the primary researcher first coded the transcripts which were subsequently reviewed by an independent coder who reviewed coded segments and noted any disagreements. The primary and independent coder met to discuss discrepancies which were resolved through consensus. All transcripts were deidentified before coding. Transcribed data were coded and organized into themes and subthemes using thematic matrices.

The constant comparative method and a modified grounded theory approach were the foundation of data analysis to make and identify connections between conditions and actions/behaviors related to vaccination (Corbin & Strauss, 2007). Specifically, a cross-case comparison was used to identify perspectives and experiences regarding COVID-19 vaccination across all participants. This approach involved comparing a single code within and across all transcribed texts to note patterns, similarities, contrasts, and themes (Miles & Huberman, 1994). Subsequently, the data were categorized and conceptualized by constructing thematic matrices. The matrices were constructed to examine patterns in behavior, attitudes, and needs of the participants to provide a better conceptual understanding. Emerged themes by case matrices were created for each code and subcode of these topics: general views on the vaccine, social influences, community norms, perceived control, information sources and trusted sources, and messaging strategies. In the matrices, the first column included emerged themes and cases that were organized in order of education level and sorted by race. This stratification was done based on previous research that has demonstrated that those with lower educational achievement and those who identify as Black are less likely to get vaccinated against COVID-19 (Khubchandani et al., 2021; McElfish et al., 2021; Willis et al., 2021). For each case that included a theme, an ‘X’ was put in that intersecting cell of the theme and the case. If a theme emerged in more than

three cases (i.e. more than three X's), the theme was considered a major theme. The major themes are reported in the Results section, along with illustrative quotes. Because the purpose of this study is to identify the full range of barriers and beliefs related to vaccine uptake, even perspectives from the two participants are also reported. This study has achieved saturation among vaccinated individuals as no new themes emerged when utilizing the cross-case analysis and constant comparative method. Given that only two participants were unvaccinated, saturation was not achieved as new and unique themes emerged among unvaccinated participants. This may require more data from unvaccinated people to explore these themes and examine the full range of observations and perspectives of COVID-19 vaccination (Hennink et al., 2017).

Results

Description of Study Participants

Ninety percent of participants were fully vaccinated and 80% of participants identified as female (Table 2). The mean age was 27.6 years with 30% of participants residing in Colquitt County, 25% in Doughtery County, and 25% in Early County. The majority of participants (65%) identified as Black/African American with 40% having an educational achievement level of some college or technical school education or less. Regarding political affiliation, 35% of participants were not politically engaged, 20% were liberal, and 20% were conservative.

Table 2 Sample Descriptions

	Participants (n=20) **n (%)**
Age Range (yrs)	19-35
Mean Age (yrs)	27.55
Gender	
Male	4(20)
Female	16(80)
Racial Identity	
Black/African American	13 (65)
White	7 (35)
Ethnicity	
Hispanic	2 (10)
Non-Hispanic	18 (90)
County of Residence	
Colquitt	6 (30)
Dougherty	5 (25)

Early	5 (25)
Lee	1 (5)
Mitchell	1 (5)
Randolph	1 (5)
Worth	1 (5)
COVID-19 Vaccine Status (%)	
Yes	18 (90)
No	2 (10)
Educational Level	
High School or GED Certificate	1 (5)
Some College or technical school	7 (35)
College Graduate	6 (30)
Post-graduate or professional degree	6 (30)
Political Affiliation	
Conservative	4 (20)
Liberal	4 (20)
Independent	1 (5)
Not politically engaged	7 (35)
Prefer not to answer	3 (15)

Attitudes Towards COVID-19 Vaccination

This study sought to capture participants' attitudes towards vaccination. This included experiential attitudes (overall feelings about COVID-19 vaccination) and instrumental attitudes (evaluation of outcomes of the COVID-19 vaccination). The themes found included feelings that vaccines will help people protect themselves and others, and that the vaccines will help society

return to normal. Other themes included downsides such as side effects and long-term effects concerns.

Experiential Attitudes

Participants were asked about their general thoughts on the COVID-19 vaccines. Their feelings on COVID-19 vaccination and the value they put into these attitudes can demonstrate their motivation and intention to get vaccinated. Almost all participants viewed the COVID-19 vaccines positively with some participants stating that with the vaccine they believe that their symptoms would be minimized if infected with COVID-19.

> *"I think it's safe and effective and it is important for people of all ages that are able to get it to help them have a better chance of surviving if they get the virus"* (Black Female, 26)

Others have stated they believe that the vaccines are safe and effective and that, by being vaccinated, they are safe and protected. Specifically, participants perceived a low likelihood of contracting COVID-19 and perceived a low severity if they contracted it while being vaccinated.

> *I feel like it is good that they did that because it also has saved lives, and it's kept people from – even if they do catch the COVID they don't have the severe symptoms without being vaccinated. So it's a good idea that they came up with it*. (Black Female, 33)

In addition to feeling safe and protected by the vaccine, when explaining their general views on the vaccine, some participants shared that they believe that getting the vaccine will help society return to a sense of normalcy.

> *"I actually think that the vaccine is very effective. I have no negative views on the vaccine because it has affected me and my family in a positive way. So I don't have any negative views. It's pretty much beneficial. And I feel that everybody should take it if they want to normalize the world again"* (Black Female, 28)

Among the 20 participants, two were unvaccinated. One of the two unvaccinated participants intended on getting the vaccine in the future while the other had no intentions of ever getting vaccinated. Both did not have overwhelmingly positive views on the vaccine, sharing that they have uncertainties about the vaccines and that the vaccines are good for those who want them.

> *"I think it works. I don't know, other than that I'm just not sure about it, I guess I could say"* (WG, White Male, 20)

> *"I think it's good for some, it's good for the most people, especially older people that scared to get the COVID virus. I think it good for them…I think COVID's good for people if they believe in it because, some people, it's against their beliefs. They don't believe in gettin' vaccines."* (Black Male, 35)

Instrumental Attitudes

Beliefs on COVID-19 vaccination, whether if it's positive or negative, can impact vaccination behavior. Negative beliefs can hinder vaccination while positive beliefs can increase vaccination intention. Participants were asked about the downsides of getting the vaccine or if they had any worries about it. The side effects experienced directly after receiving the COVID-19 vaccines were a common downside many participants expressed.

> *"Once I actually got it, the only downside to it was I caught a little cold and my arm was hurting horribly. The pain in your arm after you get it, I guess because of where the muscle they injected in, it was really sore. That was the only downside to me, the soreness of your arm"* (Black Female, 32)

In addition to the side effects experienced after the vaccine was administered, participants were also generally worried about the long-term side effects that could occur due to vaccination as there is limited research on it.

> *"Definitely the side effects. I mean I still worry about the long-term effects just because it hasn't – I mean I don't know if they really know the long-term effects."* (White Female, 24)

Participants also expressed concerns about the COVID-19 vaccine development process, specifically citing the speedy nature through which it was created and distributed.

> *"So I – if there were two things that concerned me, number one, it was the speed at which it was rolled out, the speed at which it was approved, and then the side effects that I personally would feel*." (White Male, 31)

Participants were then asked about potential good things that could be or are resulting from getting the COVID-19 vaccine. Participants commented that the vaccine has helped them feel safe and protected, it helps them to protect others, and it can help slow down the number of cases or end the pandemic altogether.

> *"I feel like I'm keeping people around me safe, and I feel like I'm doing my part in trying to slow down the cases of COVID-19"* (Black Male, 22)

Other positives that were shared from being vaccinated included feeling safe at work and feeling comfortable being around other people.

> *"And I still continue to mask when I'm out in public and again when we're visiting elderly relatives. But it's really been great to be around family and friends again. And have some normal socialization."* (White Female, 31)

Participants who shared that feeling safe at work was a benefit of being vaccinated typically were employed in industries or areas that are considered high-contact such as healthcare, education, or retail.

> *"Peace of mind is the main one for me 'cause I work in healthcare, and I've worked in people's homes, so I was always very, very nervous going into people's homes, but once I got the vaccine—but, of course, I still wear my mask and things, but it's just more peace of mind."* (Black Female, 29)

Perceived Norms

To understand the perceived norms (beliefs about others' feelings or actions) towards COVID-19 vaccination, we asked questions probing the participants' injunctive norms (whether people approve or disapprove of the COVID-19 vaccination) and descriptive norms (whether most people are getting vaccinated). Common themes that emerged were that close relatives and friends are vaccinated and have encouraged the participants to get the vaccine. Furthermore, participants have observed that vaccine hesitant people tend to be older people, and vaccine hesitant groups are young adults. As perceived norms may impact vaccination intention, the following themes can provide an understanding of the common vaccination norms that surround young adults in southwest Georgia.

Injunctive Norms

Participants were asked questions related to social influences and community norms as it relates to the vaccine. When asked who encouraged them to get the vaccine, participants generally shared that close family members and friends were the ones to encourage them to get vaccinated against COVID-19.

Parents

> *"Definitely my parents. My dad was for the vaccine because vaccine technology has worked for all of our lifetime. So he was really the first one that was like, hey, when the COVID vaccine rolls out and I can get it, we should all go and get it. So he was definitely the one who kind of put it in my mind."* (White Female, 20 years)

Spouse/Partner

> *"My husband…He mainly was telling me what happens if I catch it and don't be vaccinated, and I could die from it, but if I catch it and be vaccinated I have a better chance of living. So I went ahead and took it because he encouraged me to take it."* (Black Female, 33 years)

When asked about the reasons why certain family members or friends were encouraging them to get vaccinated, participants reported that minimizing side effects/severe outcomes, limiting exposure to a family member who is at high risk for severe symptoms, and limiting severe outcomes for participants who work in high exposure jobs were among the most commonly cited reasons.

> *"They've all been vaccinated, so they were just recommending that based off of my career field that I needed it, and then also to be around them, they have some health concerns, and it just – like I said, it puts me at ease to be around them, knowing that if something happened it will be very harsh on them with their conditions"* (Black Female, 23)

When participants were asked who discouraged them from getting vaccinated, most participants stated that no one discouraged them. Of those who were discouraged, participants shared that family members, friends, and coworkers were significant people in their lives who discouraged them.

> *"Mainly people at work that I work with. They were against it, a couple of them…They were saying that I may pass away in the next five to 10 years, that it's microchips being put inside of you, and all that stuff. That was mainly the two most said things."* (Black Male, 22)

Of the two participants who reported not receiving the COVID-19 vaccine, one reported that no one encouraged nor discouraged them to get vaccinated. The other shared that while a co-worker encouraged them, their brother discouraged them from getting the vaccine.

Descriptive Norms

Participants were then asked whether their friends and family members are getting the vaccine and the reasons why. Participants overwhelmingly stated that their family and friends have received the vaccine with few others sharing that they have not. The reasons family and friends have received the vaccine included wanting to protect themselves from getting COVID-19, experiencing severe outcomes, and protecting the health and well-being of others.

> *"Because it got so bad, especially in our county. And Randolph was one of the worst counties that – we had like 20, 30, maybe 40 people around us dying, like ten a week. So I was mainly like, "You all need to get the vaccination." ...And with my family, it was the kids was going to school and they was catching it at school, and they was bringing it back home. So that kind of encouraged them to go ahead and get the vaccination."* (Black Female, 33)

Participants shared that another reason why family and friends got the vaccine was due to job requirements or employee incentives or benefits.

> *"Because they don't want to get sick, or because their job was offering them money to get it."* (Black Female,28)

> *"Some are required by work. It's a work requirement. Some is just I'm guessing want to get it to be more safer."* (Black Female, 26)

Other participants shared that their family and friends received the vaccine so that mask-wearing requirements could end and life could return to a semblance of normalcy.

> *"Yes, pretty much all my immediate family is vaccinated and a good bit of my close friends are vaccinated as well. ...Like I said before, protection from COVID and hopefully being able to take our masks off and not have to wear them as much. That was the biggest thing why I think people got the vaccine.* (Black Female, 19

For the few participants who reported that their family and friends have decided not to get vaccinated, the reasons included believing misinformation, concerns with vaccine development and its effect on people, and medical distrust.

Misinformation

He [My boyfriend] feels like we don't know what we're putting in our bodies. We don't know what's in the shot…So those are his concerns. And I guess, maybe he's waiting to see because there were some stories about how people got cerebral palsy from getting the vaccine, and they just had these horrific side effects, so I think that just kind of scared him too" (Black Female, 31)

Vaccine Development Concerns

"Well, they think that it's got stuff in it that it doesn't have in it. I don't really know what they think is in it that is going to – I don't know what they think it's going to do to them" (White Female, 24)

Medical Distrust

"Because they think that it's just a experiment on us and that they don't normally give us shots and stuff for free, so how come are they giving it to us free now" (Black Female, 28)

Community Norms

Participants were also asked which groups of people in their community are getting the vaccine as soon as they can. In response to which groups are the most confident in the vaccine, participants overwhelming stated that older people are the most vaccine confident and are getting the vaccine as soon as they can.

Mostly I've seen it be the elderly, the ones who believe they're more at a higher risk of getting COVID and not making it. (White Female, 27)

Maybe older people. I think I noticed that people that were a little bit older went to get it first (Black Female, 29)

Among participants who shared that older people are more likely to get the vaccine, they explained that older people are more likely to be affected by COVID-19 because of age and preexisting conditions. Other groups that are getting the vaccine as soon as they can include those who work around many people in industries such as healthcare and education.

Definitely most of the older people, probably like 60s and up I know have all gotten it, and then people who work around a lot of people whether that's like healthcare or business, a lot of people like that have it. (White Male, 20)

Participants were also asked which groups in their community are not getting the vaccine as soon as they can. In response to which groups are the most hesitant in receiving the vaccine, participants shared that young adults, those with limited education, and younger black adults are not getting the vaccine.

The younger. They don't think is effective or they just don't want to get it. Somebody said it was a chip in the vaccine or it can track you with the vaccine, stuff like that. (Black Female, 35)

In addition to conspiracy theories related to the vaccine, participants also reported that reasons that young adults may be hesitant include a lack of knowledge about the vaccine, a lack of seriousness towards the pandemic, political opinions, and fear of side effects. Some participants explicitly mentioned that Black people, specifically younger Black people, are not getting the vaccine and are most hesitant.

> *Younger [Black] people are perceiving it negatively. As I said, the white people will sit down and chat to their family and, "Hey, we're going to get vaccinated so we can go to grandma's house this Christmas," and stuff like that. But with black people, you know, "I don't care. I'm not doing all that." And then "If I gotta be vaccinated I'm just not gonna go." Things like that.* (Black Female, 23)

The reasons that younger black people are hesitant are similar to those of the general young adult population, however many Black people and younger Black people have medical distrust and question the purpose of the vaccines.

> *African-Americans 30 and under are definitely not getting it just because of the rumor everybody's saying it like it's trynna kill off the Black population or they created it too quickly.* (Black Female, 32)

Participants also commented that those who are uneducated or have a limited level of education are likely to not get the vaccine.

> *Yeah, so it seems like those two – so maybe uneducated and people who may have a distrust in the healthcare system, and, yeah, a distrust based on maybe history in the medical – historical things that happened in the medical system.* (Black Female, 25)

Participants were also asked how young adults generally view the COVID-19 vaccines. Most participants stated that young adults either view the vaccines negatively or do not take COVID-19 seriously.

> *"Younger people are more of getting out and going and I just feel that they don't take it serious as the older people do."* (Black Female, 26)

The most commonly cited reasons for this lack of seriousness and/or distrust towards the COVID-19 vaccine stem from social media and the misinformation and conspiracy theories that are common on those sites.

> *Probably because all of the theories and stuff on social media about the vaccine that come out. They're kind of ridiculous, but I feel like that can have an influence on the younger group is all the theories that people come up with about the side effects of the vaccine and what it'll do to you. And some of them probably just don't care about getting it so…"* (Black Female, 19)

Environmental Facilitators & Constraints

To understand the environmental constraints, facilitators, and other barriers participants experienced, we asked participants what made it easy or hard for them to get vaccinated. The themes included no environmental constraints with age restriction criteria being the only barrier faced. Environmental constraints and facilitators do not relate to intention but directly impact COVID-19 vaccination. This is useful in understanding how the presence of constraints, or lack thereof, fostered vaccination uptake among young adults.

Participants were first asked what facilitated or made it easier for them to receive the COVID-19 vaccine. They shared multiple facilitators which include having vaccination locations close to home, multiple locations offering vaccines, and vaccinations offered at places of employment or school.

Convenient Location

> *It was in the area really close to me. And it was also very easy to find that location, and there were signs everywhere that led you to that direction. They were posted all over*

social media. And they gave most of the steps and stuff that you might have to go through when you get there. (Black Female 26)

Multiple locations

It made it easier because where I stayed they had more than one place. It's not that like, oh, I could just go to the hospital or I had to go to the doctor's office. They had different stations where I can go get it like the pharmacy and Walmart or my local pharmacy that's in neighborhood-wise. It wasn't just solely based at a hospital. (White Female, 28)

Vaccinations Offered at Work or School

The other thing that encouraged me is they came to my job. I didn't have to go anywhere. I didn't have to do anything different. I just showed up for work and I got vaccinated. So it wasn't like I had to be somewhere or do something different. I got it done on my [planning] period. My job made it very easy for me to get the vaccine (White Male, 32)

Additionally, participants commented that vaccinations being free and having an easy and quick process were also facilitators to getting vaccinated.

It was pretty easy. They did a drive-through at the hospital where you could just get the vaccine, and it was pretty quick. So it wasn't a long wait or anything (DK, Black Female, 22)

It was free. I didn't have to pay for it. So, that was another thing." (Black Female, 31)

Participants were also asked what made it relatively difficult for them to get vaccinated. While most admitted that there were no barriers or constraints to receiving the vaccine, some participants shared that waiting to be eligible for vaccination was a barrier they had to face.

> *I had to wait a lot to get the vaccine because they did do the elderly group first. So first you had to wait for them to even develop the vaccine, then you had to wait again for them to test it, all that stuff, and then the elderly group got it first and then I had to wait.* (Black Female, 19)

For one of the two participants who were unvaccinated the offering of a mobile clinic at which to receive the COVID vaccine would increase their chance of getting it. However, it will not increase uptake for the other participant because they report that their faith would protect them as it had for past illnesses and health issues.

> *'Yes, that's one of the big reasons why 'cause I always been a firm believer in God. Even when I was growin' up as a kid, I was sick and stuff. I had bad asthma, bronchitis when I was growin' up as a kid. A lotta stuff happen to me in my life that God brought me out of"* (Black Male, 35)

Information Needs

Despite the positive attitudes and ease of access to vaccination services, participants still had concerns that needed to be addressed. For assessing information needs, participants were asked what information they still need, who are the best communicators, and who are the most trusted sources of information. Major themes included needing more information on side effects and booster shots and having high levels of trust in local community members and organizations. These themes can illuminate how the antecedents of calculation (the search and engagement with vaccine information) and confidence in these organizations and people impact vaccination uptake.

Calculation

Participants were then asked about what information they or others still need about COVID-19 vaccines. Most participants mentioned that they would like more information on the long-term effects of getting vaccinated and what are its ingredients.

> *My thing is I'm wanting to know what was in it, like the ingredients. What's in it. And it seemed like no one could provide that. So that was really just a waste to ask questions.* (Black Female,28)

Another area of interest was the booster shot. Participants reported wanting more information on when to take the booster shot, why it's needed, and how long it would last.

> *The only thing I don't know about right now is the booster. That one's still kind of – I don't know about that one yet. Like do I need it? Do I not need it? I don't know* (White Female, 32)

Best Communicators

When asked who the best people would be to communicate information on the COVID-19 vaccines, most participants preferred to hear information from local people and organizations such as local physicians, community leaders, the city council, and the local health department.

> *County commissioners, city council members, pastors, you know people that work in a community*. (Black Female, 35)

Participants also noted that healthcare professionals would be the best people to communicate the information.

> *I would say doctors, people at the health departments, nurses, any type of clinics like that. If you go to a clinic they should have pamphlets available if you just need to call*

somebody at your local department to ask a question or something like that. (Black Female, 32)

Most Trusted Source of Information

Participants were asked about what organizations or government entities are trusted most to provide information about COVID-19 vaccines. The people or organizations must be trusted by participants who are locally situated, like churches and the local health department.

Probably churches and the health department. 'Cause that's just typically the people that—those are typically the entities that people in my community lean on for information and, like I said, social media. (Black Female, 29)

Local people and institutions are the most trusted among the participants because they have closer proximity to residents and the residents lean on these people and organizations. Conversely, the federal and state governments and other government organizations were less trusted due to a relatively moderate to high level of government mistrust.

*I think there's just a lot of stuff floating out there from the Federal Government, State Government, CDC, everybody, and a lot of it differs from and people are a little hesitant to trust people they don't, I guess, is the point. (*White Female, 24)

Trust in Different Sources

To further identify trusted sources among southwest Georiga residents, participants were asked what is the level of trust that the federal government, state government, local hospitals, and the local health department will provide accurate information about the COVID-19 vaccines. Trust in the federal government spread from minimally trusted to highly trusted. Participants

who have little trust in the federal government reported that there is governmental distrust among family and friends due to politics and changes in information presented. Some only trusted the government on certain topic areas.

> *Because I don't completely trust the government, because there's so much stuff that they can do but won't do. And they just –* nuh-*uh. I don't know. I trust them – it's like a 50/50. I trust them on certain subjects and certain things I don't trust them on.* (Black Female, 33).

When asked about the level of trust in the state government, participants were more trusting of the state government compared to the federal government with few participants stating they do not trust the state government. A predominant reason that participants reported higher trust in the state government is that they have more control over who represents them compared to the federal government, therefore, the state government better represents their interests.

> *They mostly trust them, trust their judgment, trust that they have the best interest for everybody* (Black Female, 35)

> *I don't know if it's just because they feel like, with the federal government, it's on a mass scale, and within the Georgia government, it's Georgia people trying to protect Georgia people. I'm not sure. I think the smaller the institution, the more reliable people feel like it is*. (Black Female, 29)

Participants were then asked about the level of trust in the local hospitals. Around half of the participants rated the local hospitals highly with the other half rated them poorly. Among participants who have a high level of trust in their local hospitals, reasons for that trust included

that the hospitals were closer to the community and that the hospitals provided the community with information and updates related to COVID-19.

> *Because they keep us updated quite often on things we can do. They also offer several resources, alternatives as well if you're not ready for the vaccine*. (Black Female 23)

> *I think they do a good job of letting us know the information that they know.* (Black Female, 26)

Among participants who did not trust their local hospitals, the reasons mentioned included negative interactions and negative experiences with care provided in the past.

> *They wouldn't provide any information. It just seems like it would be too much secrecy out there. Too much suspicion. I don't know. I just don't trust those people* (Black Female, 28)

> *I don't think people trust our hospital. For example a Facebook friend of mine the other day, she posted—she took her baby to Phoebe and they didn't listen. She was telling them maybe I need to do an x-ray or something. Something's wrong with my kid. They wouldn't listen. They just, hey here go antibiotics, send her home* (Black Female, 32)

Some participants mentioned that they prefer to go to Alabama to receive care than go to their local hospital.

> *But the ones that are in Alabama, right across the river, I would go there long before I'd go to the one in Blakeley. I think there are some hospitals in our area that maybe are a little bit more trustworthy than the one here in Blakeley. So I wouldn't – I wouldn't trust*

them a whole lot, to begin with. But that was long before the pandemic. (Black Female, 26)

When participants were asked about their level of trust in their local health department, the majority of participants rated it highly. They shared that the local health department provides accurate information and that they trust the information the health department provides.

They're probably the people I'm going to trust the most about the vaccine just because I think it's very non-biased. They're reporting strictly facts and statistical data rather than opinion. (White Female, 20)

Participants were then asked in what way would they prefer to receive information about the COVID-19 vaccine. Most participants mentioned that social media and email would be the ideal way to receive information, especially for young adults.

Probably through the community, but I feel like the most readily available information towards my age group would probably be through social media. (White Male 20)

While most participants reported that social media would be the preferred mode of receiving information, some noted that social media platforms host a substantial amount of misinformation.

Messaging Strategies

Participants were then told some messages that could be used to convince people to get vaccinated. These five messages focused on preventing the spread of the virus, decreasing the chance of dangerous variants, protecting older people in your life, helping the U.S develop herd immunity, and keeping schools and businesses open. Participants generally found that the

message focusing on protecting older people in one's life was the most convincing as people would like to protect their grandparents and/or parents.

> *I would say that is definitely the most important statement because it points to the most vulnerable populations who get very sick from COVID or potentially die. So, yeah, especially if you have grandparents or older individuals in your life that you're close to. Yeah, that's a very good statement of encouragement"* (Black Female, 25)

> *I think that would be the biggest influence. My husband, when he talks about it, his reasoning for getting it is just because he's around his grandparents, but other than that he doesn't really want to get it because that would be a lot more likely than anything else* (White Female, 24)

In addition to protecting older people, participants overwhelmingly found that vaccination messaging focusing on keeping schools and businesses open is very convincing since people want their kids to go back to school in person and people want to get back to work.

> *That's a bit better, because when you say businesses most people think about their jobs, and then when you talk about schools most people have to send their kids to school. And I'm sure if they need a job then their kids have to be in school. So that's a bit better.* (Black Female, 23)

Most participants did not find the messages about preventing the spread of COVID-19 nor decreasing the chance of dangerous variants convincing. They have observed that people who are vaccinated are still contracting COVID-19, therefore the disease is still spreading. Furthermore, they found that the Delta variant emerged even though many people were vaccinated.

> *I would say that that probably wouldn't persuade people. And the reason I say that is because with the delta variant that just came out, I know I've heard that some people's argument is you've got the vaccine, and that's not helping. That's not decreasing the numbers with the delta variant, so how would it decrease numbers in the future with other variants?* (Black Female, 31)

Perspectives on the COVID-19 Pandemic

When participants were asked how they view the COVID-19 pandemic, some had a neutral perspective noting that the pandemic was bad at the beginning but less so at the time of this study. Furthermore, some shared that the pandemic is not as bad as other pandemics and that it could have been worse. However, most participants viewed the pandemic negatively by referencing the number of cases and lives lost, worsening of mental health, and the number of normal activities and events that were missed.

Discussion

The purpose of this study is to identify the needs and attitudes towards COVID-19 vaccination among young adults in southwest Georgia. With qualitative interviews, this study adds to the increasing literature about COVID-19 and the perspectives surrounding COVID-19 vaccination uptake. Moreover, the qualitative nature of this study allows for a deeper insight into the general views of COVID-19 vaccination, the perceived norms, environmental constraints, and the information needs among young adults residing in the southwest Georgia region. By utilizing the IBM and the 5C models as a theoretical framework for this study, we can better understand how these attitudes, norms, constraints, and needs informed participants' vaccination uptake or refusal choices.

According to the IBM model, the participants' attitudes and beliefs concerning the COVID-19 vaccines would be a key factor in vaccination intention. This was demonstrated in how a significant portion of participants in our study viewed the vaccines positively and decided to get vaccinated against COVID-19. A sense of safety against COVID-19, caring for others' health, and returning to normalcy were the main reasons participants provided for their positive views. Most research about the attitudes and beliefs among young adults has shown that most people are willing to take the COVID-19 vaccine, especially those who have at least a college graduate degree (Khubchandani et al., 2021; King et al., 2021; McElfish et al., 2021; Willis et al., 2021). Similarly, in our study, most participants were college-educated which may have contributed to their welcoming and positive response to the vaccines. Our study also corroborates findings from prior studies which conclude that vaccination side effects are the main concern among people (Pogue et al., 2020). Before vaccination, most participants in this study were

concerned about side effects, however, the perception of protecting themselves and others from COVID-19 outweighed their concerns about vaccination development and side effects.

The perceived norms of others' beliefs about COVID-19 vaccination and whether they are getting the vaccine are key factors in the IBM as they can affect an individual's vaccination intention. This study also explored the perceived norms towards COVID-19 vaccination among the participants' social groups and the larger community. People who have a family member who is already vaccinated and shows trust in the vaccine, are more likely to be vaccinated themselves (Kecojevic et al., 2021). Most participants in the current study reported that many of their friends and families were vaccinated or intended on getting vaccinated. This is congruent with the IBM model which demonstrates how others' beliefs and actions can impact one's behavior intention. Reasons for vaccination included returning to normalcy, satisfying job requirements, receiving employment benefits, or preventing severe outcomes if they ever contracted COVID-19. Participants also noted that a close family member such as a parent, grandparent, or a significant other encouraged them to get vaccinated. Furthermore, those who were discouraged from getting the vaccine reported that they were discouraged also by family members or co-workers. Similar to prior studies, participants reported that the reasons for vaccination hesitancy among family and friends included medical distrust, concerns over the development of the vaccine, and believing in misinformation or disinformation (King et al., 2021). Those who were unvaccinated did not perceive any intention among family and friends to get vaccinated nor had a close relative or friend encourage them to get vaccinated.

Prior research has demonstrated that COVID-19 hesitancy decreases as age increases (McElfish et al., 2021; Willis et al., 2021). A significant number of our participants reported that older people and those who work in high contact fields are confident in the COVID-19 vaccines.

Conversely, participants shared that young adults, Black American young adults, and those with little education are hesitant towards the vaccines. This perception by participants is corroborated by prior studies that found that younger, Black/African Americans, those with lower income, and those with some college education are more likely to be vaccine hesitant (Willis et al., 2021).

Past studies have also demonstrated that COVID-19 hesitancy decreases as age increases (McElfish et al., 2021; Willis et al., 2021). Moreover, research on other vaccinations such as influenza and HPV has shown that young adults are more likely to get the vaccine if they perceive high benefits, high perception of susceptibility to the disease, and are more knowledgeable about the vaccines (Manhart et al., 2011; Shon et al., 2021). Participants in our study have noted that young adults either have a negative view of the vaccine or that they did not appreciate the seriousness of COVID-19. Many participants cited misinformation, lack of education, and low perception of COVID-19 susceptibility as reasons for the lack of confidence in the vaccines among young adults, findings that a similarly found in prior research (Dibble et al., 2019; Shekhar et al., 2021).

This study also explored the environmental facilitators and constraints of receiving the COVID-19 vaccines. Barriers to accessibility, accommodation, and uncertainty in eligibility are factors that may prevent people from COVID-19 vaccination uptake (Carson et al., 2021). Most of our participants reported that they experienced no barriers or constraints to getting vaccinated. Many participants shared that the presence of convenient locations and offering vaccinations at work made it easier for them to get vaccinated. As the early part of the vaccination distribution had a rigid eligibility criterion, many participants cited that their only barrier experienced was not being eligible for the vaccine based on the age requirements. This is in line with the IBM which states that environmental constraints directly impact behavior. With none of the

participants experiencing any environmental constraints, if one were already intending to get vaccinated there would have been no interference with COVID-19 vaccination uptake.

Concerning vaccinations, people tended to desire more reliable information from trusted messengers, like personal health care practitioners or community leaders (Carson et al., 2021). The 5C model discusses calculation and how the search for and engagement with information on vaccines impact vaccination intention. Similarly, while most participants were already vaccinated, many still want to receive information on the vaccines' long-term side effects and clarifications on the necessity of booster vaccinations. Participants preferred that information regarding the COVID-19 vaccinations is provided by local community leaders or local health departments since they are closer and more knowledgeable about the community compared to the state and federal governments. More than half of the participants reported preferring this information to be shared via social media, although some of these participants' also shared concerns due to the proliferation of misinformation on those platforms.

This study also explored what types of COVID-19 messaging strategies would convince young adults to get vaccinated. The majority of participants shared that messaging about how the vaccine could prevent severe outcomes for older people in one's life was very important and convincing. Messaging about how the vaccination can help keep schools and businesses open was also viewed favorably. The participants found that messaging strategies that stated that vaccination uptake may decrease the spread of COVID-19 or that it would decrease the chance of new, dangerous variants are not effective. This is due to participants still observing a rise in COVID-19 cases across the country and the new emergence of the Delta variant.

Limitations

This study has several limitations. First, this study did not achieve saturation for those who are unvaccinated as there were very few unvaccinated participants. This results in a lack of robust perspectives on how ones' attitudes, perceived norms, personal agency, and environmental constraints lead to a lack of vaccination intention. For example, one of the two unvaccinated participants shared that they will never get vaccinated as their faith has protected and will continue to protect them which had not occurred among those who were vaccinated. Given that new themes such as this have emerged among unvaccinated participants, more data from unvaccinated individuals will allow for a more in-depth and robust understanding of the pathways to vaccination refusal (Hennink et al., 2017). In addition to the lack of saturation, most participants were already vaccinated against COVID-19 and had at least some college education. As a result, the findings are not attributable to those who are not vaccinated and those who have less than a college education. Second, selection bias may have also occurred as the majority of participants were female. Third, there is a possibility of socially desirable responses with participants potentially refraining from expressing negative viewpoints on the vaccines. Fourth, having a second coder review the codes of the primary coder is not as rigorous a method to ensure intercoder reliability as it is with having two independent coders.

Implications and Conclusion

This study has numerous implications for vaccination uptake behavior and health communication among young adults, particularly those living in rural and more conservative communities. Similar to past research, our study states that the perception of disease risk is linked with the level of trust in healthcare professionals, the government, and public health institutions. However, this study also suggests that communication and engagement through

trusted local community members and sources are essential to promote the success of COVID-19 vaccination and mitigate health disparities (Dubé et al., 2013; Salmon et al., 2021). Vaccination is greatly influenced by social norms and social pressure among young adults, therefore targeting young adults' social circles and influences, such as their family members and peers, and communicating via their preferred means of receiving information can help establish trust in vaccines and improve uptake (Britt & Englebert, 2018; Dubé et al., 2013). Clear communication from trusted sources and limited constraints to vaccination should be considered going forward when planning a national or local public health response to vaccination concerns. Furthermore, health departments should use messaging strategies that depict how vaccination can impact the social lives of young adults compared to messaging that shares scientific facts. This can consist of how the vaccines may help protect a loved one or how it can make their life return to normal compared to messages that are less personal such as reducing cases or new variants.

This study also supports the utilization of the 5C model of psychological antecedents to vaccination uptake in conjunction with the Integrated Behavioral Model (IBM) to analyze vaccination intention and identify areas that health organizations and vaccination programs should target to increase vaccination confidence and intention. This study also suggests areas of research that are needed for understanding vaccination uptake, especially during a pandemic. First, there is still relatively limited published research about COVID-19 vaccination uptake behaviors, attitudes, beliefs, and norms in the United States, particularly after the vaccines became available. Furthermore, the attitudes and beliefs of those who are against COVID-19 vaccination uptake are still relatively unknown. Second, based on our findings, participants viewed that vaccination hesitancy was due to misinformation, vaccine development concerns, and lower perceived susceptibility to the disease. Additional research regarding misinformation

and development concerns on the COVID-19 vaccines can help create strategies to reduce their presence and build trust among people and young adults in Georgia and across the United States.

References

Abedi, V., Olulana, O., Avula, V., Chaudhary, D., Khan, A., Shahjouei, S., Li, J., & Zand, R. (2021). Racial, economic, and health inequality and COVID-19 infection in the United States. *Journal of racial and ethnic health disparities, 8*(3), 732-742.

Al-Sanafi, M., & Sallam, M. (2021). Psychological determinants of covid-19 vaccine acceptance among healthcare workers in kuwait: A cross-sectional study using the 5c and vaccine conspiracy beliefs scales. *Vaccines, 9*(7), 701.

Baack, B. N., Abad, N., Yankey, D., Kahn, K. E., Razzaghi, H., Brookmeyer, K., Kolis, J., Wilhelm, E., Nguyen, K. H., & Singleton, J. A. (2021). *COVID-19 Vaccination Coverage and Intent Among Adutls Aged 18-39 years-United States, March-May 2021*. Centers for Disease Control and Prevention. Retrieved October 16th, 2021 from https://www.cdc.gov/mmwr/volumes/70/wr/mm7025e2.htm

Baltrus, P. T., Douglas, M., Li, C., Caplan, L. S., Blount, M., Mack, D., & Gaglioti, A. H. (2021). Percentage of Black population and primary care shortage areas associated with higher COVID-19 case and death rates in Georgia Counties. *Southern Medical Journal, 114*(2), 57.

Bednarczyk, R. A., Chu, S. L., Sickler, H., Shaw, J., Nadeau, J. A., & McNutt, L.-A. (2015). Low uptake of influenza vaccine among university students: evaluating predictors beyond cost and safety concerns. *Vaccine, 33*(14), 1659-1663.

Betsch, C., Schmid, P., Heinemeier, D., Korn, L., Holtmann, C., & Böhm, R. (2018). Beyond confidence: Development of a measure assessing the 5C psychological antecedents of vaccination. *PloS one, 13*(12), e0208601.

Brewer, N. T., Chapman, G. B., Rothman, A. J., Leask, J., & Kempe, A. (2017). Increasing vaccination: putting psychological science into action. *Psychological Science in the Public Interest, 18*(3), 149-207.

Britt, R. K., & Englebert, A. M. (2018). Behavioral determinants for vaccine acceptability among rurally located college students. *Health Psychology and Behavioral Medicine, 6*(1), 262-276.

Callaghan, T., Moghtaderi, A., Lueck, J. A., Hotez, P., Strych, U., Dor, A., Fowler, E. F., & Motta, M. (2021). Correlates and disparities of intention to vaccinate against COVID-19. *Social Science & Medicine (1982)*.

Carson, S. L., Casillas, A., Castellon-Lopez, Y., Mansfield, L. N., Morris, D., Barron, J., Ntekume, E., Landovitz, R., Vassar, S. D., Norris, K. C., Dubinett, S. M., Garrison, N. A., & Brown, A. F. (2021, Sep 1). COVID-19 Vaccine Decision-making Factors in Racial and Ethnic Minority Communities in Los Angeles, California. *JAMA Netw Open, 4*(9), e2127582. https://doi.org/10.1001/jamanetworkopen.2021.27582

Centers for Disease Control and Prevention. (2021a). *About Variants*. https://www.cdc.gov/coronavirus/2019-ncov/variants/about-variants.html

Centers for Disease Control and Prevention. (2021b). *CDC Covid Data Tracker*. Centers for Disease Control and Prevention

https://covid.cdc.gov/covid-data-tracker/#vaccinations_vacc-total-delivered-rate-total

Centers for Disease Control and Prevention. (2021c). *COVID-19 Vaccines and Vaccination*. Centers for Disease Control and Prevention,. Retrieved October 11, 2021 from https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/fully-vaccinated-people.html

Centers for Disease Control and Prevention. (2021d). *How CDC is Making Vaccine Recommendations*. https://www.cdc.gov/coronavirus/2019-ncov/vaccines/recommendations-process.html

Centers for Disease Control and Prevention. (2021e). *Implementation Guide for Key Informant Interviews (KIIs) and Listening Sessions*. https://www.cdc.gov/vaccines/covid-19/vaccinate-with-confidence/rca-guide/downloads/CDC_RCA_Guide_2021_Tools_AppendixB_KIIInterviews-ListeningSessions-508.pdf

Centers for Disease Control and Prevention. (2021f). *Possible Side Effects*. https://www.cdc.gov/coronavirus/2019-ncov/vaccines/expect/after.html?s_cid=10509:side%20effects%20of%20covid%2019%20vaccine:sem.ga:p:RG:GM:gen:PTN:FY21

Centers for Disease Control and Prevention. (2021g). Post-COVID Conditions. https://www.cdc.gov/coronavirus/2019-ncov/long-term-effects/index.html

Chavez, N., Barajas, A., & Gallagher, D. (2020). *How two funerals helped turn one small Georgia city into a hotspot for coronavirus*. CNN. https://www.cnn.com/2020/04/02/us/albany-georgia-coronavirus/index.html

Chung, T., Marrow, A. K., Brigham, E. P., Mastalerz, M. H., & Venkatesan, A. (2021). *COVID 'Long Haulers': Long-Term Effects of COVID-19*. Johns Hopkins Medicine. https://www.hopkinsmedicine.org/health/conditions-and-diseases/coronavirus/covid-long-haulers-long-term-effects-of-covid19

Corbin, J., & Strauss, A. (2007). *Basics of Qualitative Research (3rd ed.): Techniques and Procedures for Developing Grounded Theory*. SAGE Publications. https://doi.org/https://dx.doi.org/10.4135/9781452230153.n9

Cunningham, J. W., Vaduganathan, M., Claggett, B. L., Jering, K. S., Bhatt, A. S., Rosenthal, N., & Solomon, S. D. (2021). Clinical outcomes in young US adults hospitalized with COVID-19. *JAMA internal medicine*, *181*(3), 379-381.

D'Souza, G., & Dowdy, D. (2021). *Rethinking Herd Immunity and the Covid-19 Response End Game*. Johns Hopkins Bloomberg School of Public Health. https://publichealth.jhu.edu/2021/what-is-herd-immunity-and-how-can-we-achieve-it-with-covid-19

Daley, E. M., Vamos, C. A., Thompson, E. L., Zimet, G. D., Rosberger, Z., Merrell, L., & Kline, N. S. (2017). The feminization of HPV: how science, politics, economics and gender norms shaped US HPV vaccine implementation. *Papillomavirus Research, 3*, 142-148.

Davoodi, N. M., Healy, M., & Goldberg, E. M. (2020, Jan-Dec). Rural America's Hospitals are Not Prepared to Protect Older Adults From a Surge in COVID-19 Cases. *Gerontol Geriatr Med, 6*, 2333721420936168. https://doi.org/10.1177/2333721420936168

Dibble, K. E., Maksut, J. L., Siembida, E. J., Hutchison, M., & Bellizzi, K. M. (2019). A systematic literature review of HPV vaccination barriers among adolescent and young adult males. *Journal of adolescent and young adult oncology, 8*(5), 495-511.

Dobis, E. A., & McGranahan, D. (2021). *Rural Residents Appear to be More Vulnerable to Serious Infection or Death From Coronavirus COVID-19*. United States Department of Argriculture. Retrieved October 16, 2021 from https://www.ers.usda.gov/amber-waves/2021/february/rural-residents-appear-to-be-more-vulnerable-to-serious-infection-or-death-from-coronavirus-covid-19/

Dubé, E., Laberge, C., Guay, M., Bramadat, P., Roy, R., & Bettinger, J. (2013, Aug). Vaccine hesitancy: an overview. *Hum Vaccin Immunother, 9*(8), 1763-1773. https://doi.org/10.4161/hv.24657

Eldredge, L. K. B., Markham, C. M., Ruiter, R. A. C., Kok, M. E. F., & Parcel, G. S. (2016). *Planning Health Promotion Programs: An Intervention Mapping Approach*. Jossey-Bass.

Elfein, J. (2021a). *Distribution of total COVID-19 cases in the U.S. as of March 13, 2022, by age*. Statista. https://www.statista.com/statistics/1254314/us-share-of-total-covid-cases-by-age-group/

Elfein, J. (2021b). *Distribution of total COVID-19 deaths in the U.S. as of September 29, 2021, by age*. Statista. https://www.statista.com/statistics/1254488/us-share-of-total-covid-deaths-by-age-group/

Figueroa, J. F., Wadhera, R. K., Mehtsun, W. T., Riley, K., Phelan, J., & Jha, A. K. (2021). Association of race, ethnicity, and community-level factors with COVID-19 cases and deaths across US counties. Healthcare,

Georgia Department of Public Health. (2021). *GA DPH Vaccine Distribution Dashboard*. Georiga Department of Public Health. Retrieved October 12, 2021 from https://experience.arcgis.com/experience/3d8eea39f5c1443db1743a4cb8948a9c

Hausman, B. L., Lawrence, H. Y., Marmagas, S. W., Fortenberry, L., & Dannenberg, C. J. (2020). H1N1 vaccination and health beliefs in a rural community in the Southeastern United States: lessons learned. *Critical Public Health, 30*(2), 245-251.

Hennink, M. M., Kaiser, B. N., & Marconi, V. C. (2017). Code saturation versus meaning saturation: how many interviews are enough? *Qualitative health research, 27*(4), 591-608.

Higgins, V., Sohaei, D., Diamandis, E. P., & Prassas, I. (2021). COVID-19: from an acute to chronic disease? Potential long-term health consequences. *Critical reviews in clinical laboratory sciences, 58*(5), 297-310.

Kecojevic, A., Basch, C. H., Sullivan, M., Chen, Y.-T., & Davi, N. K. (2021). COVID-19 vaccination and intention to vaccinate among a sample of college students in New Jersey. *Journal of community health, 46*(6), 1059-1068.

Khanijahani, A. (2021). Racial, ethnic, and socioeconomic disparities in confirmed COVID-19 cases and deaths in the United States: a county-level analysis as of November 2020. *Ethnicity & Health, 26*(1), 22-35.

Khubchandani, J., Sharma, S., Price, J. H., Wiblishauser, M. J., Sharma, M., & Webb, F. J. (2021, Apr). COVID-19 Vaccination Hesitancy in the United States: A Rapid National Assessment. *J Community Health, 46*(2), 270-277. https://doi.org/10.1007/s10900-020-00958-x

King, W. C., Rubinstein, M., Reinhart, A., & Mejia, R. (2021, Dec). COVID-19 vaccine hesitancy January-May 2021 among 18-64 year old US adults by employment and occupation. *Prev Med Rep, 24*, 101569. https://doi.org/10.1016/j.pmedr.2021.101569

Kumari, A., Ranjan, P., Chopra, S., Kaur, D., Upadhyay, A. D., Kaur, T., Bhattacharyya, A., Arora, M., Gupta, H., & Thrinath, A. (2021). Development and validation of a questionnaire to assess knowledge, attitude, practices, and concerns regarding COVID-19 vaccination among the general population. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews, 15*(3), 919-925.

Lobelo, F., Bienvenida, A., Leung, S., Mbanya, A., Leslie, E., Koplan, K., & Shin, S. R. (2021). Clinical, behavioural and social factors associated with racial disparities in COVID-19 patients from an integrated healthcare system in Georgia: a retrospective cohort study. *BMJ open, 11*(5), e044052.

MacDonald, N. E. (2015, Aug 14). Vaccine hesitancy: Definition, scope and determinants. *Vaccine, 33*(34), 4161-4164. https://doi.org/10.1016/j.vaccine.2015.04.036

Machalek, D. A., Garland, S. M., Brotherton, J. M., Bateson, D., McNamee, K., Stewart, M., Rachel Skinner, S., Liu, B., Cornall, A. M., & Kaldor, J. M. (2018). Very low prevalence of vaccine human papillomavirus types among 18-to 35-year old Australian women 9 years following implementation of vaccination. *The Journal of infectious diseases, 217*(10), 1590-1600.

Manhart, L. E., Burgess-Hull, A. J., Fleming, C. B., Bailey, J. A., Haggerty, K. P., & Catalano, R. F. (2011). HPV vaccination among a community sample of young adult women. *Vaccine, 29*(32), 5238-5244.

Mayo Clinic. (2021). *COVID-19 (coronavirus): Long-term effects*. https://www.mayoclinic.org/diseases-conditions/coronavirus/in-depth/coronavirus-long-term-effects/art-20490351

McElfish, P. A., Willis, D. E., Shah, S. K., Bryant-Moore, K., Rojo, M. O., & Selig, J. P. (2021, Jan-Dec). Sociodemographic Determinants of COVID-19 Vaccine Hesitancy, Fear of Infection, and Protection Self-Efficacy. *J Prim Care Community Health, 12*, 21501327211040746. https://doi.org/10.1177/21501327211040746

Mercadante, A. R., & Law, A. V. (2021). Will they, or Won't they? Examining patients' vaccine intention for flu and COVID-19 using the Health Belief Model. *Research in Social and Administrative Pharmacy, 17*(9), 1596-1605.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. sage.

Mills, L. A., Head, K. J., & Vanderpool, R. C. (2013). HPV vaccination among young adult women: a perspective from Appalachian Kentucky. *Preventing chronic disease, 10*.

Moghadas, S. M., Vilches, T. N., Zhang, K., Wells, C. R., Shoukat, A., Singer, B. H., Meyers, L. A., Neuzil, K. M., Langley, J. M., & Fitzpatrick, M. C. (2021). The impact of vaccination on COVID-19 outbreaks in the United States. *medRxiv*.

Montano, D. E., & Kasprzyk, D. (2015). Theory of reasoned action, theory of planned behavior, and the integrated behavioral model. *Health behavior: Theory, research and practice, 70*(4), 231.

Murthy, B. P., Sterrett, N., Weller, D., Zell, E., Reynolds, L., & Toblin, R. L. (2021). *Disparities in COVID-19 Vaccination Coverage Between Urban and Rural Counties — United States, December 14, 2020–April 10, 2021* (Morbidity and Mortality Weekly Report, Issue. https://www.cdc.gov/mmwr/volumes/70/wr/mm7020e3.htm

Painter, J. E., Sales, J. M., Pazol, K., Wingood, G. M., Windle, M., Orenstein, W. A., & DiClemente, R. J. (2010). Psychosocial correlates of intention to receive an influenza vaccination among rural adolescents. *Health education research, 25*(5), 853-864.

Pingali, C., Meghani, M., Razzaghi, H., Lamias, M. J., Weintraub, E., Kenigsberg, T. Y. A., Klein, N. P., Lewis, N., Fireman, B., & Zerbo, O. (2021). COVID-19 Vaccination Coverage Among Insured Persons Aged≥ 16 Years, by Race/Ethnicity and Other Selected Characteristics—Eight Integrated Health Care Organizations, United States, December 14, 2020–May 15, 2021. *Morbidity and Mortality Weekly Report, 70*(28), 985.

Pogue, K., Jensen, J. L., Stancil, C. K., Ferguson, D. G., Hughes, S. J., Mello, E. J., Burgess, R., Berges, B. K., Quaye, A., & Poole, B. D. (2020, Oct 3). Influences on Attitudes Regarding Potential COVID-19 Vaccination in the United States. *Vaccines (Basel), 8*(4). https://doi.org/10.3390/vaccines8040582

Poyraz, B. Ç., Poyraz, C. A., Olgun, Y., Gürel, Ö., Alkan, S., Özdemir, Y. E., Balkan, İ. İ., & Karaali, R. (2021). Psychiatric morbidity and protracted symptoms after COVID-19. *Psychiatry research, 295*, 113604.

Quinn, S. C., Jamison, A., Freimuth, V. S., An, J., Hancock, G. R., & Musa, D. (2017). Exploring racial influences on flu vaccine attitudes and behavior: Results of a national survey of White and African American adults. *Vaccine, 35*(8), 1167-1174.

Rahman, M., Islam, M., & Berenson, A. B. (2015). Differences in HPV immunization levels among young adults in various regions of the United States. *Journal of community health, 40*(3), 404-408.

Salmon, D., Opel, D. J., Dudley, M. Z., Brewer, J., & Breiman, R. (2021, Mar). Reflections On Governance, Communication, And Equity: Challenges And Opportunities In COVID-19 Vaccination. *Health Aff (Millwood), 40*(3), 419-425. https://doi.org/10.1377/hlthaff.2020.02254

Shekhar, R., Sheikh, A. B., Upadhyay, S., Singh, M., Kottewar, S., Mir, H., Barrett, E., & Pal, S. (2021, Feb 3). COVID-19 Vaccine Acceptance among Health Care Workers in the United States. *Vaccines (Basel), 9*(2). https://doi.org/10.3390/vaccines9020119

Shon, E.-J., Choe, S., Lee, L., & Ki, Y. (2021). Influenza vaccination among US college or university students: A systematic review. *American Journal of Health Promotion, 35*(5), 708-719.

Thompson, E. L., Rosen, B. L., & Maness, S. B. (2019). Social determinants of health and human papillomavirus vaccination among young adults, National Health Interview Survey 2016. *Journal of community health, 44*(1), 149-158.

Trzebiński, W., & Trzebiński, J. (2022). Do Optimists Like Vaccines? The Effect of Perceived Vaccine Novelty and Beliefs in the World's Positivity and Orderliness on the Attitudes toward COVID-19 Vaccinations—The Case of European Young Adults. *Vaccines, 10*(3), 379.

U.S Food and Drug Administration. (2021). *Comirnaty and Pfizer-BioNTech COVID-19 Vaccine*. https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/comirnaty-and-pfizer-biontech-covid-19-vaccine

Willis, D. E., Andersen, J. A., Bryant-Moore, K., Selig, J. P., Long, C. R., Felix, H. C., Curran, G. M., & McElfish, P. A. (2021, Jul 2). COVID-19 vaccine hesitancy: Race/ethnicity, trust, and fear. *Clin Transl Sci*. https://doi.org/10.1111/cts.13077