“Post COVID-19 Analysis of Barrier Method Use and Sex Practices Among Undergraduate Students”

by

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**Abstract**

**Background:** Undergraduate students are often between ages 18-24 and have a high predisposition for engaging in risky sexual behaviors. The COVID-19 pandemic increased the normality of socially protective behaviors and communicable disease knowledge for public health defense.

**Purpose:** To measure the frequency of barrier method use among undergraduate students in response to the COVID-19 pandemic including variables of relationship status, forms of sex, and barrier method communication comfort.

**Methods:** A researcher-created questionnaire was used to collect data on the COVID-19 safety habits, sexual behaviors, and communication practices of the previous 12 months among respondents.

**Results:** Precautionary behaviors related to COVID-19 were not predictive of safer sex behaviors like barrier method use among the undergraduate population from August 2020-August 2021. Additional tests that demonstrated statistical significance included: Upperclassmen comfort in barrier method communication with non-monogamous partners; Increased face mask use and handwashing among fully-vaccinated participants before vaccination than afterward; and Self-identified “Lesbians” were the least likely sexual identity to use any form of barrier method.

**Discussion:** Tests did not prove overall significance between socially and sexually protective behaviors, but future research could compare the identities and sexual practices of individuals on their knowledge and application of population and public health preservation.

**Keywords:** *undergraduates, COVID-19, public health safety guidelines, barrier method use, sexual behaviors*

## Background

Outward-facing sexualities and abnormal sexual behaviors are common assumptions associated with 18- to 24-year-olds. This group represents the largest age proportion of undergraduate students that are often amidst a transitional period of their lives (Weitbrecht & Whitton, 2020, p. 123). It is often asserted in the public understanding that “undergraduates” are more likely to be fluid, open, and frequent with their sexual interactions and partners in ways that are not as rigidly monogamous and hetero-focused as other age cohorts. Concerning their sexual exploration, those aged 15 to 24 accounted for 55.4% of the sexually transmitted infection cases in 2019 (*Sexually Transmitted Disease Surveillance 2019*, 2021). The prevalence of negative sexual health outcomes of these sexual behaviors needs to be addressed and prevented to maintain the overall wellness of the group. This study analyzed the sexual behaviors of undergraduate students 16 months after the onset of the COVID-19 pandemic to construct findings on how sexual behaviors adapted amidst stringent national, state, and local safety protocols from the Centers for Disease Control and Prevention (CDC). The researcher inquired about the impact of these safety guidelines on the possible precautions taken by those with a lower probability of emulating sexually protective practices.

### Outlining Sexual Health

The sexual practices analyzed in this study were limited to consensual sexual behaviors that put participants at risk for communicable disease exchange. The forms of sex referenced are oral (mouth to genitals contact), vaginal (penis/sex toy to vagina contact), anal (penis/sex toy to anus contact), finger/hand contact (finger/hand to genitals), mutual masturbation (stimulation of one’s own genitals - included only if stimulation is created from a shared sex toy), and genital humping/rubbing (genital to genital contact). Forms of consensual sex not referenced in this study were excluded because they lacked a correlation to barrier method use but these forms were not meant to be diminished or ignored.

To differentiate between the terms “STI” and “STD,” the definitions are as follows: a sexually transmitted infection (STI) is a bacteria, virus, or protozoa transmitted through sexual contact from someone who is already infected, and a sexually transmitted disease (STD) is the resulting disease of an STI (Hou, Korotchenko, & Pysmenna, 2020, p. 216). For much of the report, “STI” will be the primarily used term unless the subject is more appropriately defined by “STD.”

Acknowledging the risks of any sexual interaction, “safe sex” is not an appropriate term for protective sexual behaviors. As many sexual interactions inherently have a minimal risk for STI transmission and/or unplanned pregnancy, the term “safer sex” is more appropriate when referring to the use of barrier methods to decrease the risk of negative sexual health outcomes (Safer Sex).

The importance of concentrating on barrier method use among the undergraduate population was for the analysis of safer sex frequencies with products that are financially and administratively accessible. In this study, a “barrier method” was defined as a form of STI protection or contraception that blocks fertilization and contact with sexual fluids while not requiring hormones or professional administration for use. Methods included in this study’s definition are external (male) condom, internal (female) condom, dental dam, finger cot/finger condom, spermicide alone, diaphragm with spermicide, and sponge with spermicide. This study additionally acquired data on the comfort levels of participants for partner communication about barrier method use with delineations between monogamous and non-monogamous sexual partners.

**The Sexuality of Undergraduate Students**

“Emerging adults” is another label for the undergraduate age cohort of 18- to 24-year-olds and this group often follows sexual development patterns influenced by the college campus setting (Griner, et al., 2017, p. 647). Customarily-aged US college students are between the mean age of first intercourse at 17 and first marriage at 29 which can influence their diversity of

sexual experiences (Wesche, Lefkowitz, & Maggs, 2021, p. 2). Hook-up culture can be embedded into general college culture because of the notions of independence in its many forms among emerging adults. “Hooking up” is defined as sexual activity between two people who are not in a committed (monogamous) relationship, but this can vary based on forms of sexual activity that range from kissing to penetrative sex (Weitbrecht & Whitton, 2020, p. 124).

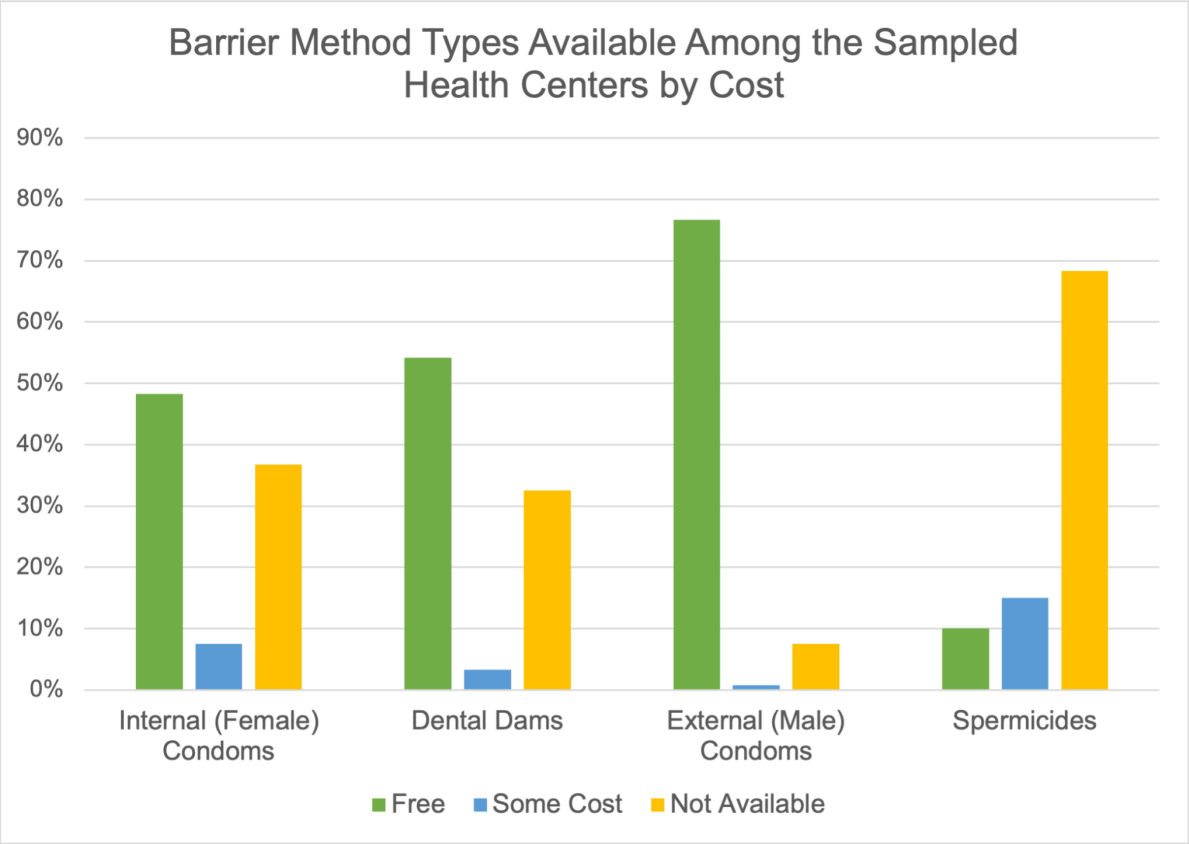
Developmentally, there is a large trajectory for change among sexually-active college students and their decisions within hook-up culture throughout their college career. The Online College Social Life Survey’s data from 2005 and 2011 and analysis by Jonathan Marc Bearak provided a series of conclusions: between freshman and senior years, the odds of hooking up double; condom use during a hook-up decreases by half between freshman and sophomore year; and condom use decreases when sexual partners attend the same college (Bearak, 2014, p. 484). As hook-up culture implies risk, the influence and actualization of sexually protective practices should be integrated into this common behavior while students experience sexual development.

**The Footprint of Barrier Method Use**

The American College Health Association’s (ACHA) National College Health Assessment (NCHA) is a national survey of undergraduate and graduate students based on holistic health data points including sexual health (*About ACHA-NCHA*). In the Spring 2021 semester, the ACHA-NCHA III web survey collected data from over 70,000 undergraduate students (*ACHA-NCHA III*, 2021, p. 36). Findings indicated that students engaged in oral (34.9%), vaginal (35.4%), and anal (3.5%) sex in the past thirty days but only 5% of oral, 37.1% of vaginal, and 22.5% of anal sex included the use of a barrier method “most of the time” or “always” (*ACHA-NCHA III*, 2021, pp. 36-37). Even those who reported engaging in various forms of sex did not use barrier methods frequently and this begs the question: what influences this group to use barrier methods regularly?

Barrier method use among undergraduate students is often influenced by the access and education of a campus community. Among these emerging adults, students are limited by their perceptions and motivations to seek out assistance regarding their health which is often limited in the context of sexual health. A common remedy for resource hesitancy is a university-provided barrier method distribution service at little to no cost to students for discreet and easy access. According to “College Institutional Characteristics and The Use Of Barrier Methods Among Undergraduate Students,” barrier method distribution programs, while more common on campuses with more than 5,000 students, can increase student access to various types of barrier methods (Griner, et al., 2017, pp. 650, 657). The ACHA 2019 Sexual Health Services Survey catalogued the data of 120 campus health centers and categorized the access of barrier methods available to students by type (*ACHA 2019 Sexual Health Services Survey Report*, 2020, p. 25). The sampled health centers indicated cost for each type of surveyed barrier method: internal (female) condoms, dental dams, external (male) condoms, and spermicides including suppositories/foams/jellies/vaginal contraceptive films (*2019 Sexual Health Services Survey Report*, 2020, p. 25). Among the sampled health centers, 76.7% provided external (male) condoms and 54.2% provided dental dams for free, 7.5% provided internal (female) condoms at some cost, and 68.3% did not provide spermicides (*2019 Sexual Health Services Survey Report*, 2020, p. 25). Refer to Graph 1 for the knowledge and variety of access on campuses that can influence the decision of students to use barrier methods with fewer financial or social inhibitions.

**Graph 1. ACHA 2019 Sexual Health Services Report - Barrier Method Types Available Among the Sampled Health Centers by Cost**




**Decision-Making for Barrier Method Use**

Material hardship is a description of poverty to the extent of unmet basic necessities like food, shelter, and utilities, that can impact the cognitive capacity of individuals to effectively make long-term plans (Field, 2020, p. 2058). Some college students experience material hardship, and this can impact their sexual health planning and acquisition of contraceptives. Elly Field aptly wrote, “Contraception is a decision and action that must be implemented over and over again” (Field, 2020, p. 2058) which can be corroborated by those who must choose between basic needs and contraceptive protection due to financial insecurity. The repetitive action of buying condoms can be a fluctuating priority for those with the cognitive pressures of material hardship. With financial difficulty to plan and pay for intrauterine devices (IUDs) and

implantable rods, these individuals do not have the privilege to protect themselves for long periods of time because of the initial expense and time necessary for medical administration (Field, 2020, pp. 2060-2061). By not being able to have the consistent ability to buy contraceptives, and often being in relationships with similarly disadvantaged people, some people choose to take the risk of unprotected sex within committed relationships and use their limited resources for other priorities (Field, 2020, pp. 2060-2061). Material hardship can be a deterrent from barrier method use and should be addressed in the educational and clinical interventions of barrier method programming.

Another deterrent of barrier method use is a partner who dissuades the use of STI and/or contraceptive protection during sexual acts. Data from a 2001 study indicated that 17% of male and 14% of female participants had successfully dissuaded a partner from condom use and 30 to 47% of participants in a separate study indicated that one or more of their sexual partners had attempted to dissuade condom use (King, Scott, & Wajeeh, 2005, pp. 586-587). The pressure to not use condoms can be influenced by partner preference or intimidation no matter the needs of the other partner. Deterring barrier method use can also come in the form of “stealthing” which is when a sexual partner initially uses a barrier method but before or during sexual activity, the method is removed without their partner’s consent (Davis, 2019, p. 997). This is a form of coercive pressure to engage in non-consensual sexual interactions by initially establishing trust with a partner, but it has been most recently defined as sexual assault due to the intentional and malicious nature of the action (Davis, 2019, p. 997). Among the many reasons for abstaining from or being deterred from barrier method use, these factors must be considered when analyzing the reasoning and frequency of barrier method use. Whether the result of a power imbalance or an act amidst intimate partner violence, the omission of barrier method use is a deterrent from safer sexual practices among those who want to be protected.

**Integrating COVID-19**

The premise of this study involved the impact of the COVID-19 pandemic on the sexual health practices and considerations of an age cohort already amidst assumed risk for communicable diseases. The integration of the COVID-19 habits into the sexual behaviors of undergraduates attempted to illuminate the pressures to engage in safer sex when another well-known health concern may have impacted those choices.

The SARS-CoV-2 virus that causes COVID-19 was discovered in December 2019 and the disease abbreviation of corona (CO) virus (VI) disease (D) was announced by the World Health Organization (WHO) in February 2020 (*Basics of COVID-19*, 2021). COVID-19 is a type of coronavirus that can cause respiratory and other bodily symptoms like fever, muscle/body aches, nausea/vomiting, etc (*Symptoms of COVID-19*, 2021). COVID-19 can spread by water droplets and small particles that contain the virus from infected individuals breathing or depositing it onto surfaces which when inhaled or collected by an uninfected individual, the virus can be introduced to their immune system, and they can contract the disease (*How COVID-19 Spreads*, 2021). Under direction from the Centers for Disease Control and Prevention (CDC), COVID-19 safety guidelines were created to protect the general public as individuals interacted with those outside of their household. Some of the guidelines created after the US outbreak in March 2020 and maintained at the time of this study were: wearing a face mask, maintaining six feet of distance from others, avoiding crowded and poorly-ventilated indoor settings, using soap and water for frequent handwashing, and regularly cleaning high-touch surfaces, e.g., phones, countertops, light switches (*Protect Yourself*, 2021). The COVID-19 vaccines were approved by the Food and Drug Administration (FDA), and each required different processes for vaccinated individuals to be appropriately protected from COVID-19 (*Safety of COVID-19 Vaccines*, 2021). Regardless of vaccine brand, an individual was considered “fully vaccinated” two weeks after their final dose and the vaccine decreased the probability of contracting the disease, suffering from severe complications, and death (*When You’ve Been Fully Vaccinated*, 2021).

Combining the precautions directed by the CDC and a generalized knowledge of barrier method use for safer sex practices, this study interpreted the impact of the COVID-19 pandemic on how frequent barrier methods were used to decrease the probability of contracting communicable diseases.

**Previous COVID-19 and Sex-Related Research**

In the months following the initial US COVID-19 outbreak, research was conducted to study the initial effects of the pandemic and safety procedures on specific groups as these data could be later compared to long-term effects on the populations.

In a study conducted to compare the COVID-19 health behaviors of sexual minorities to the sexual majority, there were illuminating results in the first few months of the pandemic (Grist, et al., 2021, p. 2). 84.53% of all participants reported washing or sanitizing their hands after touching something outside of the home, 84.86% reported wearing masks in public, and 91.68% reported social distancing six feet from others in public regardless of sexuality (Grist, et al., 2021, p. 6). Sexual minority participants were less likely to wash their hands, wear masks, and social distance due to negative stereotypes about their group that caused lower self-esteem when adopted by the individual (Grist, et al., 2021, pp. 7-8). These data could be reflected among other marginalized groups because of the risk for internalized discrimination influencing their desire to participate in public health initiatives for the benefit of others.

At the time of the initial COVID-19 outbreak, there was a concern for the need for sexual health assistance of adolescents and young adults due to the previously diminished desire for preventive care among 12- to 24-year-olds (Bell, Kantor, & Lindberg, 2020, p. 75). From lacking privacy with telemedicine in their homes to decreased access to in-person sexual health care, those in this age group were less likely to search for and obtain sexual and reproductive care even as sexual interactions continued (Bell, Kantor, & Lindberg, 2020, p. 76). The study made future projections on what care would be desired by those in need of protective products and

sexual health care with the then-present restrictions as time could show an increase in the frequency of sex due to growing apathy for the pandemic.

Reporting the full range of effects of COVID-19 on sexual behaviors will take years to develop but preliminary data points like those referenced informed the present study and may influence the complex conclusions of the future.

The use of barrier methods can demonstrate the desire and ability of STI and pregnancy prevention among users and this study inquired about the pressures, limitations, and reasons why the methods were used or not. Conducting a study on the prevalence of barrier method use was intended to be a pandemic-specific representation of a generation of sexually active individuals at high risk for STIs who had an uncommonly-comprehensive lived experience with communicable diseases that was possibly translational to their sexual protection practices.

**The Present Study**

This study analyzed the sexual behaviors and protective practices of undergraduate participants as a response to the COVID-19 pandemic. The researcher hypothesized that face mask use when unvaccinated would be correlated to the likelihood of using any type of barrier method when engaging in sexual activity in the 12 months prior to the administered questionnaire (Hypothesis 1), underclassmen status (first- to second-year academic classification) would be associated with comfort in talking with a non-monogamous partner about barrier method use (Hypothesis 2), and upperclassmen status (third- to fifth-year academic classification) would be associated with infrequent use of barrier methods and participants would indicate use “sometimes” or “never” (Hypothesis 3).

Reasoning for vaccination status was not studied so the researcher must assert that status does not equate to a certain level of cleanliness or interest in the health of others. The reasoning for an individual to be vaccinated against COVID-19 can be based on a host of factors and the medical inability to be vaccinated was not intended to be diminished for this study. The relation of unvaccinated face mask use to barrier method use was based on an

interest in finding connections between socially and sexually protective practices and if those public and intimate choices were statistically significant in a population known for engaging in risky behaviors.

Deriving from the commentary of Jonathan Bearak (2014), Hypotheses 2 and 3 were practical applications of the findings of the 2005 and 2011 Online College Social Life Survey data. One of the conclusions related to academic classification was that the greater amount of time in college decreases an individual's likelihood to engage in barrier method use which continues to decrease in frequency as the likelihood of sexual interactions increases (Bearak, 2014, pp. 495-499). Though sexual activity was less frequent among first- and second-year undergraduate students, the likelihood to engage in barrier method use was highest for those in this group and this could be the result of more comfort in talking about barrier method use, decreased prevalence of sexual activity from "hook-ups" (closer familiarity to partner), or lessened peer pressure to not use barrier methods. This study did not analyze the prevalence of hook-up culture among college students, but the commentary of Jonathan Bearak (2014) generated salient findings about the prevalence of barrier method use based on academic classification experiences which reflected the sexual protective behavior inquiries of this study.

## Methods

This study received an exemption from the Institutional Review Board of Appalachian State University and was classified as Non-Human Subject Research.

### Context

The study was influenced by connections of the researcher to Appalachian State University programs that addressed the sexual health needs and education of undergraduate students on campus. Working with a student organization called "Wellness Educators for Change Advocacy and student Needs" (WE CAN), the researcher led sexual health presentations that addressed questions and comments about sexual health, behavior, and precautions. WE CAN also introduced the researcher to an on-campus resource called the

“Condom Fairy” which is a free barrier method distribution service. It is available by request to students by providing external condoms, internal condoms, dental dams, finger cot/finger condoms, lubricants, and sexual health information in discreet packaging. By working on the fulfillment portion of the service, the researcher was able to infer the limited sexual health literacy of students alongside their desires for barrier methods when free and widely advertised.

**Secondary Data Sources**

This study utilized data from the Condom Fairy service and the biennial Campus Wellness Assessment conducted by Wellness and Prevention Services at Appalachian State University. Wellness and Prevention Services permitted the research to use anonymized Condom Fairy data from March 2019 to March 2020, the time period was 12 months before the onset of the COVID-19 pandemic. The data included details from student orders for certain forms of barrier methods and styles for those forms, e.g., External Condoms: Trojan ENZ. The data also provided qualitative responses with reasons for using the service and how students learned about the Condom Fairy.

The Campus Wellness Assessment is a biennial survey completed by undergraduate, graduate, and professional students at Appalachian State University to assess their physical, mental, sexual, social, and financial wellness. Data were collected in a three-week period from September 2019 to October 2019. The survey served as a data baseline before the onset of the COVID-19 pandemic in March 2020 due to the depth of questions surrounding sexual health that could be paralleled to the present analysis. Analyzed data were limited to participants who indicated being undergraduate students so it could be comparable to the researcher-created questionnaire.

Data from the Condom Fairy and Campus Wellness Assessment were permitted for research use by Appalachian State University’s Wellness and Prevention Services and all data used in this study were anonymized and analyzed as a whole to maintain the privacy of previous participants.

**Research Design**

When compiling questions and formatting the researcher-created questionnaire, reputable models for sexual health assessment and self-administered interviewing were utilized to inform efficacy. None of the referenced surveys were explicitly used in the final questionnaire but content, structure, and methods of data collection were translated for present use.

The National Survey of Family Growth (NSFG) is a survey of the "ever-married" population of men and women ages 15 to 49 (*About the National Survey of Family Growth*). Created by CDC and U.S. Department of Health and Human Services (HHS) in 1973, the survey has been conducted with both periodic and continuous interviewing methods to collect data on the general, reproductive, and sexual health of the sampled population (*About the National Survey of Family Growth*). The survey was most recently conducted in a combination of in-person interviews and virtual questionnaires using computer-assisted personal interviewing (CAPI) (*About the National Survey of Family Growth*). The interview questions that inspired researcher-created questions were compared in Table 1 and prove that the NSFG content was not copied for the researcher-created questionnaire but influenced the content categories and formatting for the selected questions. Both question EL-3b (*2017-2019 NSFG Female CAPI-Lite Questionnaire*, p. 122) from the NSFG interview questions and the source about barrier method dissuasion (King, Scott, & Wajeeh, 2005, pp. 586-587) informed question 5.23 of the research-created Qualtrics questionnaire about barrier method efficacy. Question JD-5 *(2017-2019 NSFG Female CAPI-Lite Questionnaire*, p.181) informed the researcher of the need for detailed reasoning for barrier method use for questions 5.30 and 5.31 of the researcher-created Qualtrics questionnaire to better understand the pressures for barrier method use among both users and non-users.

**Table 1. Comparison of Questions from the National Survey of Family Growth (NSFG) to Researcher-Created Qualtrics Questionnaire**

| NSFG (2017-2019) | Researcher-Created |
|---|---|
| { ASKED IF R USED THE CONDOM ONCE IN THE PAST 4 WKS<br>EL-3b. Was the condom used for only part of the time during intercourse? That is, was it put on after you started having sex, or taken off during sex but before ejaculation?<br>Yes.....1<br>No.....5 | Q5.23. When have you used a barrier method in the past 12 months, has the method been used for only a portion of the sexual interaction? Select all that apply.<br>▢ Yes, barrier method was taken off before ejaculation<br>▢ Yes, barrier method was put on after sexual activity had already begun<br>▢ Yes, barrier method broke or malfunctioned and was removed<br>▢ Yes, other (Please specify) _____<br>▢ No<br>▢ I do not know |
| JD-5. The last time you had vaginal intercourse with a male, did you use the condom to...<br>To prevent pregnancy, .....1<br>To prevent diseases like gonorrhea, chlamydia, syphilis, herpes or<br>AIDS,.....2<br>For both reasons.....3<br>Or for some other reason .....4 | Q5.30. When you have used barrier methods during a sexual interaction, what have been the most important reasons why? Please use the rank order feature to indicate the most (1) to least (7) important reasons why you have used a barrier method.<br>_____ To prevent pregnancy<br>_____ To prevent a sexually transmitted infection (STI)<br>_____ A recent positive STD test for yourself and/or your sexual partner<br>_____ Pressure from your sexual partner to use a barrier method<br>_____ To have a sexual interaction with a non-monogamous sexual partner<br>_____ To use as an alternative to a long-acting, hormonal, or permanent contraceptive<br>_____ Other (Please specify) |
| JD-5. The last time you had vaginal intercourse with a male, did you use the condom to...<br>To prevent pregnancy, .....1<br>To prevent diseases like gonorrhea, chlamydia, syphilis, herpes or<br>AIDS,.....2<br>For both reasons.....3<br>Or for some other reason .....4 | Q5.31. When you have not used barrier methods during a sexual interaction, what have been the most important reasons why not? Please use the rank order feature to indicate the most (1) to least (7) important reasons why you have not used a barrier method.<br>_____ The preferred barrier method was not available<br>_____ To engage in an unexpected/unanticipated sexual interaction<br>_____ You and your sexual partner are not worried about pregnancy and/or STIs<br>_____ A recent negative STI test for yourself and/or your sexual partner<br>_____ Pressure from your sexual partner to not use a barrier method<br>_____ To have a sexual interaction with a |

| | |
|---|---|
| | monogamous sexual partner<br>_____ To use a long-acting, hormonal, or permanent contraceptive instead<br>_____ Other (Please specify) |

**Data Collection**

Data collected from the research-created questionnaire represent responses from participants from August 16 to September 12, 2021. Data were collected on the first day of classes at the researcher's institution, Appalachian State University, but the first day of classes of unaffiliated participants may not have been on the start date. Intending to collect data before the rigor of a college semester deterred potential participant engagement, the researcher collected data only in the first four weeks of the Fall 2021 academic semester. The questionnaire was created on the data collection platform, "Qualtrics" which allowed for participants to access the measurement anonymously from computers and mobile devices. The Qualtrics questionnaire contained 52 questions of which 10 were text block explanations of procedures or relevant term definitions. Within the Qualtrics platform, the researcher was able to anonymize responses which disabled the collection of IP addresses, location data, and contact information from participants. In total, there were 243 collected responses, but some were incomplete by the end of the data collection period and were thus excluded from some analysis processes. The researcher concluded that 124 responses could be filtered and considered "complete" because they contained responses to the 13 questions necessary for analysis. The other responses were catalogued for demographic data to ensure the participants were identified within the whole sample.

**Questionnaire Items/Questions**

The Qualtrics questionnaire contained items on COVID-19 safety habits, sexual behaviors, and barrier method communication practices. These items were developed based on existing surveys, other research projects, and expert knowledge (i.e., feedback from committee

members with experience in survey research, sexual health, and health behavior). The acquisition of all data was voluntary with only four questions - those needed to determine eligibility - with required response coding. This encouraged participants to answer honestly based on their comfort with the question, not from pressure to produce a response. The voluntary responses also limited the amount of data that could be considered "complete" for analysis because comprehensive conclusions could not be made with incomplete participant data. Each section of questions contained pertinent inquiries for final analysis and the details of each were included below.

The COVID-19 safety habit section was based on CDC data and findings that were updated as recently as August 2021. This section compared the safety habits of participants before and after "fully-vaccinated" status, if applicable, as it related to handwashing and face mask use. These variables were hypothesized to be parallel social protective tools to the sexual protective tools of the barrier methods that were also evaluated. Table 2 identifies the mandatory questions from the COVID-19 safety habit section which indicated "complete" data sets for participants.

**Table 2. COVID-19 Safety Habit Questions**

| | |
|---|---|
| Q4.3 | What is your COVID-19 vaccine status?<br>O Unvaccinated<br>O Partly vaccinated (Moderna/Pfizer-BioNTech first dose only)<br>O Fully vaccinated (Moderna/Pfizer-BioNTech first & second dose or Johnson & Johnson's Janssen single dose)<br>O I prefer not to say |
| Q4.5 | Q4.5 Face Mask Use: Please indicate which settings you wore a mask when unvaccinated.<br>▢ Crowded, well-ventilated indoor setting<br>▢ Crowded, poorly-ventilated indoor setting<br>▢ Crowded outdoor setting<br>▢ Physically-distanced, well-ventilated indoor setting<br>▢ Physically-distanced, poorly-ventilated indoor setting<br>▢ Physically-distanced outdoor setting<br>▢ At home only with those in your household<br>▢ At home with those not in your household |
| Q4.6* | Face Mask Use: Please indicate which settings you wore a mask when fully vaccinated.<br>▢ Crowded, well-ventilated indoor setting |

| | |
|---|---|
| | ☐ Crowded, poorly-ventilated indoor setting<br>☐ Crowded outdoor setting<br>☐ Physically-distanced, well-ventilated indoor setting<br>☐ Physically-distanced, poorly-ventilated indoor setting<br>☐ Physically-distanced outdoor setting<br>☐ At home only with those in your household<br>☐ At home with those not in your household |
| Q4.7 | Handwashing: Please indicate which situations you washed your hands for at least 20 seconds when unvaccinated.<br>☐ Before eating with cutlery/eating utensils<br>☐ Before eating without cutlery/eating utensils<br>☐ After touching a car door, exterior door handle, or interior door handle<br>☐ After interacting with those in your household (roommates, family members, etc.)<br>☐ After interacting with friends or family who are not in your household<br>☐ After interacting with strangers who are not in your household |
| Q4.8* | Handwashing: Please indicate which situations you washed your hands for at least 20 seconds when fully vaccinated.<br>☐ Before eating with cutlery/eating utensils<br>☐ Before eating without cutlery/eating utensils<br>☐ After touching a car door, exterior door handle, or interior door handle<br>☐ After interacting with those in your household (roommates, family members, etc.)<br>☐ After interacting with friends or family who are not in your household<br>☐ After interacting with strangers who are not in your household |

*Note.* (*) indicates a question that was not visible to those who indicated “Partly Vaccinated,” “Unvaccinated,” and “I prefer not to say”

The sexual behavior section was based on sexual behavior and relational barrier methods used in the 12 months before the Qualtrics questionnaire’s administration (August 2020 to August 2021). The questions concentrated on relationships with sexual partners, forms of sexual activity, barrier method use, efficacy of barrier method, access to barrier methods, and reasoning for and against barrier method use. The response options available were intended to be comprehensive by requesting adequate information on specific forms of sexual activity and how barrier methods were involved in those behaviors by type, frequency, and effectiveness. Participants only had access to the barrier method-specific questions in the latter part of the sexual behavior section due to their completion of mandatory questions and Table 3 identifies those mandatory selections which indicated “eligible” data sets for participants from the sexual behavior section.

**Table 3. Sexual Behavior Questions**

| | |
|---|---|
| Q5.2 | In the past 12 months, how would you describe your sexual relationships? Select all that apply.<br>☐ Monogamous (committed relationship with 1 sexual partner)<br>☐ Polyamorous (committed relationship more than 1 sexual partner)<br>☐ Single and at least 1 non-committed sexual partner<br>☐ Single and no sexual partners / Asexual romantic relationship |
| Q5.5 | In the past 12 months, what forms of sexual activity have you engaged in?<br>☐ No sexual interactions (1)<br>☐ Oral (mouth to genitals contact) (4)<br>☐ Vaginal (penis/sex toy to vagina contact) (5)<br>☐ Anal (penis/sex toy to anus contact) (6)<br>☐ Finger/Hand Contact (finger/hand to genitals/anus contact - also known as "fingering" or "hand job") (7)<br>☐ Mutual Masturbation (stimulation of one's own genitals) (Note: Indicate only if stimulation is generated from sex toy shared between sexual partners) (8)<br>☐ Genital Humping/Rubbing (genital to genital contact) (9) |
| Q5.8 | In the past 12 months, have you used any type of barrier method when engaging in any form of sexual activity?<br>O Yes<br>O No<br>O I do not know |
| Q5.16 | Q5.16 Please indicate how often you used each barrier method when you were sexually active in the past 12 months.<br>"External (Male) Condom" ; "Internal (Female) Condom" ; "Dental Dam" ; "Finger Cot/Finger Condom" ; "Spermicide Alone" ; "Diaphragm with Spermicide" ; "Sponge with Spermicide"<br>O Always<br>O Most of the time<br>O About half the time<br>O Sometimes<br>O Never |
| Q5.30 | When you have used barrier methods during a sexual interaction, what have been the most important reasons why? Please use the rank order feature to indicate the most (1) to least (7) important reasons why you have used a barrier method.<br>_____ To prevent pregnancy<br>_____ To prevent a sexually transmitted infection (STI)<br>_____ A recent positive STD test for yourself and/or your sexual partner<br>_____ Pressure from your sexual partner to use a barrier method<br>_____ To have a sexual interaction with a non-monogamous sexual partner<br>_____ To use as an alternative to a long-acting, hormonal, or permanent contraceptive<br>_____ Other (Please specify) |
| Q5.31 | When you have not used barrier methods during a sexual interaction, what have been the most important reasons why not? Please use the rank order feature to indicate the most (1) to least (7) important reasons why you have not used a barrier method.<br>_____ The preferred barrier method was not available<br>_____ To engage in an unexpected/unanticipated sexual interaction<br>_____ You and your sexual partner are not worried about pregnancy and/or STIs<br>_____ A recent negative STI test for yourself and/or your sexual partner |

| | |
|---|---|
| | _____ Pressure from your sexual partner to not use a barrier method<br>_____ To have a sexual interaction with a monogamous sexual partner<br>_____ To use a long-acting, hormonal, or permanent contraceptive instead<br>_____ Other (Please specify) |

The barrier method communication section posed questions on sexual partner communication practices related to barrier method use. Questions asked about comfort in talking about barrier method use with sexual partners, if monogamous/non-monogamous sexual partners impacted communication comfort, and if barrier method use fit into the definition of consent for participants. The inclusion of communication about barrier methods added to the context of why participants may have used or not used barrier methods. Table 4 identifies the mandatory questions from the barrier method communication section which indicated "complete" data sets for participants.

**Table 4. Barrier Method Communication Questions**

| | |
|---|---|
| Q6.1 | Have you ever had a conversation with a sexual partner about barrier method use? (ex. talking about personal preferences, requesting to use a certain method, etc.)<br>O Yes<br>O No |
| Q6.2 | Do you feel comfortable talking to a monogamous sexual partner about barrier method use?<br>O Yes<br>O No |

## Sampling

Prospective questionnaire participants were limited by three criteria when identified in promotional materials: over the age of 18, current undergraduate students affiliated with any higher education institution, and had been sexually active in the 12 months before August 2021. To eliminate the need for parental consent when inquiring about the consensual sexual acts of minors, individuals under the age of 18 were ineligible to complete the questionnaire. Participants could be affiliated with any educational institution because the report was focused on habits rather than campus-specific access and influences.

To recruit potential participants for the questionnaire, the researcher created promotional materials to engage with those who fit the eligibility criteria in a promotional campaign. Prospective questionnaire participants were contacted through online sources and in-person networking. The researcher conducted a social media marketing campaign on Instagram and Facebook with three posts per week for four weeks (August 16 to September 12, 2021) about sexual health, sexual behavior risk, barrier method and contraceptive use, the importance of testing and communication, and resources available on and off Appalachian State University's campus. The online campaign also included one-time posts on LinkedIn, a university Facebook group page, university professor mass email chains, and a newsletter from the university's Honors College. The researcher also conducted an email campaign with a random sample of 1,000 undergraduate students from Appalachian State University after obtaining the email addresses from the Office of Institutional Research, Assessment and Planning (IRAP). IRAP assists in research planning, assessment, and data acquisition for students, faculty, and administrators and was used to access a random sample of undergraduate email addresses to be contacted anonymously in the interest of this study. In addition to using traditional methods of promotional marketing, the researcher utilized in-person networking and word-of-mouth methods to notify students within and outside of Appalachian State University about their eligibility for involvement for the questionnaire.

**Questionnaire Definitions**

Survey questions utilized a set of terms that were defined within the questionnaire so participants could most accurately reference the correct meanings and respond appropriately. The terms used in the questionnaire sections were often recognizable terms to the general public, but definitions included in the questionnaire were referenced to support informed responses.

The following terms were explained with definitions used within the COVID-19 safety habit section. "Fully-vaccinated" is used to describe an individual at least 2 weeks after their

final COVID-19 vaccine (*When You've Been Fully Vaccinated*). A "face mask" is a mask that has at least 2 layers of fabric, fits on either side of the face without gaps, and covers the nose, mouth, and chin (*Your Guide to Masks*). "Physically-distanced" is when an individual maintains 6 feet between themselves and those who are not in their household, also known as "social distancing" (*Protect Yourself*). "Handwashing" is the use of soap and water to disinfect the surfaces of the hands (*Protect Yourself*).

The following terms were explained with definitions used within the sexual behavior section. A "sex toy" is a term used to describe a dildo, a tool that is often shaped like a penis and is inserted into the vagina or anus, or vibrator, a vibrating tool that stimulates the genitals by being inserted into the vagina or anus or being used outside the body on the clitoris or penis (*All About Sex*). An "external (male) condom" is a sheath that covers the penis to contain ejaculate and limit the spread of STIs from the penis shaft and tip only (*External Condom Use*). An "internal (female) condom" is a large sheath with an inner ring that is inserted into the anus or vagina to rest against the cervix while the outer ring stays at the opening of the anus or vagina (vulva) to collect ejaculate (*Internal Condom Use*). A "dental dam" is a barrier between the mouth and vagina or anus during oral sex in the form of a latex or polyurethane sheet (*Dental Dam Use*). A "finger cot/finger condom" is a glove-like sheath that covers the finger to avoid contact with sexual fluids (*How Effective are Abstinence and Outercourse?*). "Spermicide" is a foam, cream, gel, film, suppository, or tablet that is inserted into the vagina and prevents fertilization by killing sperm (*Contraception*). A "diaphragm" is a shallow cup that covers the cervix to block and kill sperm and can be used with spermicide (*Contraception*). A "sponge" is a soft foam disk that contains spermicide and covers the cervix to block and kill sperm (*Contraception*).

The following term was explained with the definition used within the barrier method communication section. "Consent" is the clear, enthusiastic, and informed exchange between

individuals as they talk about specific forms of sexual activity with the knowledge that all agreements are reversible without the threat of manipulation (*Sexual Consent*).

**Data Analysis**

The data analysis process was centered around the three hypotheses of the report: Hypothesis 1- Face mask use when unvaccinated would be correlated to the likelihood of using any type of barrier method when engaging in sexual activity in the 12 months prior to the administered questionnaire; Hypothesis 2 - Underclassmen status (first- to second-year academic classification) would be associated with comfort in talking with a non-monogamous partner about barrier method use; Hypothesis 3 - Upperclassmen status (third- to fifth-year academic classification) would be associated with infrequent use of barrier methods and participants would indicate use “sometimes” or “never”

Microsoft Office Excel was the software used for analysis and statistical tests on the extracted Qualtrics data. The researcher had experience with this software and though initially intended on using the Qualtrics cross-tabulation software, decided that it was best completed through the Excel workbooks that were in use for other analysis processes. The statistical tests used to compare measures were t-tests, chi-squared tests, and descriptive statistics, and they were used to model outcomes for potential confounding variables. The alpha value for all tests was 0.05 and this indicated present or absent statistical significance as proof used to reject or accept each hypothesis. Among all of the tests conducted for the hypothesis tests and additional tests to expand on the contexts of findings, all methods used were listed within each of the results sections.

## Results

**Demographics**

The majority of the participants were assumed to have been associated with Appalachian State University because of the researcher’s affiliation and primary reach towards these individuals. The demographic makeup of Appalachian State University undergraduate

students is majority White (81.7%), women (59%) (*Student Diversity*), and living in personal housing (70%) (*Appalachian State University Student Life*). The participants of the study reflected this trend which translated to the limited diversity of individuals to represent a population more intersectional than the affiliated institution.

Among the 243 people who were survey respondents, the demographic breakdown of the participants was similar to the skewed distribution of Appalachian State University. The racial and ethnic makeup was 74.5% White, 1.2% Black or African American, 5.8% Hispanic or Latinx, 2.5% Asian, 0.8% Native Hawaiian or Pacific Islander, 0.4% Native American or Indigenous, and 4.5% Mixed Race or Biracial. The mean age was 19.95 and the highest portions of participant academic classifications were third- (25.5%) and fourth-year (29.2%) undergraduate students. Regarding gender identity, the most common identities were Cisgender Woman (66.3%), Cisgender Man (14.4%), and Gender Non-Conforming/Non-Binary (5.3%). 53.1% of all participants identified as heterosexual and the rest held LGBTQIA+ identities like Bisexual (20.2%), Lesbian (4.5%), and Unsure or Questioning (2.9%). Refer to Table 5 for more details about the additional demographic identities of the total 243 participants.

The proportion of participants that were eligible to be included in hypothesis tests because of the set of questions required for those inquiries were labeled in Table 5 as “Eligible Participants.” This demographic breakdown was unassociated because it represented a smaller sample and was acknowledged separately because this group reflects the data related only to hypothesis tests. The participants not recognized in the hypothesis tests were not omitted due to their identities but because of their lack of answers necessary for complete analysis. Additionally, all data from graduate students and staff/faculty were automatically excluded because of the requirements of the research inquiry for sole undergraduate student inclusion. Refer to Table 5 for a comparison of the data set of “All” and “Eligible” participants.

**Table 5. Demographics Comparison: "All Participants" vs. "Eligible Participants"**

| | **All Participants (n=243)** | | **Eligible Participants (n=124)** | |
|---|---|---|---|---|
| **Variable** | ***n* (%)** | **Mean (SD)** | ***n* (%)** | **Mean (SD)** |
| *Age* | | 19.95 (4.77) | | 20.3 (2.7) |
| *Academic Classification* | | | | |
| First-year undergraduate student | 43 (17.7) | | 19 (15.3) | |
| Second-year undergraduate student | 33 (13.6) | | 22 (17.7) | |
| Third-year undergraduate student | 62 (25.5) | | 30 (24.2) | |
| Fourth-year undergraduate student | 71 (29.2) | | 42 (33.9) | |
| Fifth-year undergraduate student | 16 (6.6) | | 11 (8.9) | |
| Graduate student | 5 (2.1) | | 0 (0) | |
| Staff/Faculty | 4 (1.6) | | 0 (0) | |
| *Biological Sex* | | | | |
| Female | 176 (72.4) | | 99 (79.8) | |
| Male | 46 (18.9) | | 25 (20.2) | |
| Intersex | 0 (0) | | 0 (0) | |
| *Gender Identity* | | | | |
| Cisgender Woman | 161 (66.3) | | 94 (75.8) | |
| Cisgender Man | 35 (14.4) | | 20 (16.1) | |
| Transgender Woman | 0 (0) | | 0 (0) | |
| Transgender Man | 1 (0.4) | | 0 (0) | |
| Gender Non-Conforming/Non-Binary | 13 (5.3) | | 6 (4.8) | |
| Two-Spirit | 0 (0) | | 0 (0) | |
| Open Option | 5 (2.1) | | 1 (0.8) | |
| I prefer not to say | 6 (2.5) | | 3 (2.4) | |

| | | | | | |
|---|---|---|---|---|---|
| *Race/Ethnicity* | | | | | |
| White | 181 (74.5) | | 99 (79.8) | | |
| Black/African-American | 3 (1.2) | | 2 (1.6) | | |
| Hispanic/Latinx | 14 (5.8) | | 10 (8.1) | | |
| Asian | 6 (2.5) | | 3 (2.4) | | |
| Native Hawaiian/Pacific Islander | 2 (0.8) | | 1 (0.8) | | |
| Native American/Indigenous | 1 (0.4) | | 1 (0.8) | | |
| Mixed Race/Biracial | 11 (4.5) | | 6 (4.8) | | |
| Open Option | 2 (0.8) | | 1 (0.8) | | |
| I prefer not to say | 1 (0.4) | | 1 (0.8) | | |
| *Sexual Identity* | | | | | |
| Heterosexual | 129 (53.1) | | 63 (50.8) | | |
| Gay | 5 (2.1) | | 4 (3.2) | | |
| Lesbian | 11 (4.5) | | 7 (5.6) | | |
| Bisexual | 49 (20.2) | | 31 (25) | | |
| Pansexual | 9 (3.7) | | 7 (5.6) | | |
| Asexual | 4 (1.6) | | 3 (2.4) | | |
| Queer | 6 (2.5) | | 3 (2.4) | | |
| Unsure/Questioning | 7 (2.9) | | 5 (4) | | |
| Open Option | 1 (0.4) | | 1 (0.8) | | |
| I prefer not to say | 0 (0) | | 0 (0) | | |
| *Housing* | | | | | |
| On-Campus | 71 (29.2) | | 38 (30.6) | | |
| Off-Campus, in personal housing | 144 (59.2) | | 83 (67) | | |

| | | | | |
|---|---|---|---|---|
| Off-Campus, in parent/guardian housing | 6 (2.5) | [redacted] | 3 (2.4) | [redacted] |
| *International Student* | | | | |
| Yes | 0 (0) | | 0 (0) | |
| No | 221 (90.9) | | 124 (100) | |

*Note.* (SD) denotes standard deviation; Values of "*n*" and percentages in column "All Participants" may not calculate to 243 or 100% because individuals were excluded from the questionnaire based on academic classification, not completing the demographics section, or leaving blank responses which impacted the total count of 243 participants

**Hypothesis 1**

The researcher hypothesized that face mask use when unvaccinated would be correlated to the likelihood of using any type of barrier method when engaging in sexual activity in the 12 months prior to the questionnaire's administration. This hypothesis was separated into three research questions to be correctly manipulated for statistical tests to compare results of the four questionnaire items included in the hypothesis inquiry: "Q4.3 What is your COVID-19 vaccine status?," "Q4.5 Face Mask Use: Please indicate which settings you wore a mask when unvaccinated.," "Q4.6 Face Mask Use: Please indicate which settings you wore a mask when fully vaccinated.," and "Q5.8 In the past 12 months, have you used any type of barrier method when engaging in any form of sexual activity?." The questions related to face mask use were separated by setting and without a dichotomous question asking if participants used a face mask in the previous 12 months or not. By lacking an answer choice for not using a face mask, there was no available data for participants who "never" used a face mask which could have limited the representation of some participants.

The first research question of Hypothesis 1: *Among fully vaccinated participants, how did face mask use before and after being vaccinated change based on how many settings face masks were worn?* Face mask use data from the unvaccinated (Q4.5) and fully vaccinated (Q4.6) questionnaire items were compared to analyze the differences in amounts of settings before and after fully vaccinated status. Only participants who indicated being fully vaccinated

were able to answer this question and be subsequently included in this test to ensure data were not skewed by individuals who did not fit the vaccination status at the time of questionnaire engagement. After converting all combinations of settings of face mask use to a count for both before and after fully vaccinated status, the data could be compared to determine if status changed the frequency of face mask use. The test required each combination of settings where face masks were used to be converted into single-digit number amounts and input as pre- and post-vaccination data into a paired two-sample t-test for means. Out of the 115 fully vaccinated participants that were analyzed for the amount of post-vaccination settings they wore their face masks, 93 demonstrated a decrease, 6 increased, and 16 used face masks in the same amount of pre-vaccination settings. With only eight settings to choose between, there were general options available to include traditionally utilized spaces: “Crowded, well-ventilated indoor setting;” “Crowded, poorly-ventilated indoor setting;” “Crowded outdoor setting;” “Physically-distanced, well-ventilated indoor setting;” “Physically-distanced, poorly-ventilated indoor setting;” “Physically-distanced outdoor setting;” “At home only with those in your household;” and “At home with those not in your household.” The mean of unvaccinated individuals was wearing face masks in 5.16 settings and fully vaccinated individuals had a mean of 3.36 settings. Participants who showed a decrease in use after being fully vaccinated had high statistical significance against the alpha level of 0.05 with a p-value of $<0.001$. This test demonstrated a correlation between fully vaccinated status and decreased face mask use. This correlation must be additionally heeded with the fluctuating mandates of the US after the original vaccine release in January 2021 and many people followed CDC guidance that no longer required face mask use in various settings and circumstances. The timeline of vaccinations before the surge of the COVID-19 Delta variant, return to stringent safety guidelines, and the different settings on and off a college campus, the variations in face mask use practices could be the result of many factors. The combinations of settings, though able to be ranked in frequency, did not need to be

analyzed for statistical significance to be compared to the other two research questions. Refer to Table 6 for all findings collected related to face mask use and setting-based use frequencies.

**Table 6. Hypothesis 1: Research Question 1**

| **Frequency of Face Mask Use Based on Vaccination Status** | | | | | |
|---|---|---|---|---|---|
| **Vaccination Status (n=115)** | **Mean** | **SD** | **CL** | **Variance** | ***P*-value** |
| When unvaccinated | 5.17 | 1.32 | 0.24 | 1.74 | <0.001 |
| When vaccinated | 3.37 | 1.77 | 0.33 | 3.15 | |
| **Change in Face Mask Frequency After Fully Vaccinated (n=115)** | | | | | |
| Decrease | 93 | | | | |
| Stable | 16 | | | | |
| Increase | 6 | | | | |
| **Frequency of Setting Indication (n=115)** | | | | | |
| | **When unvaccinated** | **When vaccinated** | | | |
| **Setting** | ***n* (%)** | ***n* (%)** | | | |
| Crowded, well-ventilated indoor setting | 109 (94.8) | 95 (82.6) | | | |
| Crowded, poorly-ventilated indoor setting | 109 (94.7) | 98 (85.2) | | | |
| Crowded outdoor setting | 94 (81.7) | 46 (40) | | | |
| Physically-distanced, well-ventilated indoor setting | 104 (90.4) | 57 (49.6) | | | |
| Physically-distanced, poorly-ventilated indoor setting | 94 (81.7) | 69 (60) | | | |
| Physically-distanced outdoor setting | 47 (40.9) | 11 (9.6) | | | |
| At home only with those in your household | 7 (6.1) | 2 (1.7) | | | |
| At home with those not in your household | 30 (26.1) | 8 (7) | | | |

*Note.* “Change” is amount of participants; “Frequency” is amount of situations

The second research question of Hypothesis 1: *Did fully vaccinated status increase the likelihood of barrier method use in the 12 months prior to the questionnaire's administration?* This question was analyzed by separating fully vaccinated participant data from all other participants who indicated being "Unvaccinated," "Partly vaccinated," or "I prefer not to say." These data points were from questions related to vaccine status (Q4.3) and barrier method use in the previous 12 months (Q5.8) to find a trend of barrier method use between the two statuses. Analysis was conducted with a two-sample t-test assuming unequal variances with an alpha value of 0.05 and 115 observations of fully vaccinated participants and 9 observations of all other participants. The p-value of 0.708 did not indicate statistical significance so there was no difference in barrier method use between fully vaccinated and other participants. Refer to Table 7 to find more statistical data related to this comparison. When the data were coded during analysis, affirmative barrier method use or "Yes" was indicated by 1 and opposing barrier method use or "No" was indicated by 2, so the values in Table 7 reflect that range from 1-2.

**Table 7. Hypothesis 1: Research Question 2**

| **Barrier Method Use by Vaccination Status** | | |
|---|---|---|
| **Vaccination Status** | **Mean** | ***P*-value** |
| Fully Vaccinated (n=115) | 1.4 | 0.71 |
| Remaining (n=9) | 1.33 | |

*Note.* "Mean" is a calculation of averages for dichotomous data indicating "Yes" or "No" that were coded as "1" or "2"

These findings indicated that socially protective practices like vaccinations were not indicative of sexual protective practices like barrier method use. The researcher makes the continued acknowledgment that vaccination status is not based on an altruistic desire to protect others and the reason to become vaccinated is a personal and medical decision. The data comparing vaccination status and barrier method use did not correlate and only strengthened that assertion.

The third research question of Hypothesis 1: *Is there a correlation between barrier method use and face mask use in settings with a higher likelihood of COVID-19 transmission?* This was tested with a comparison of settings based on conditions of ventilation and relation to others against face mask use with the data of those who indicated using barrier methods in the previous 12 months. Within this group, only 75 participants out of the total 124 were included due to their barrier method use because of the dichotomous requirement for the chi-square test of independence. Referring to Table 8, the settings that were compared allowed for four tests to be completed to find statistical significance among those who used a face mask or not and correlation within the affirmative or barrier method use group. There was statistical significance between affirmative and opposing face mask use in high-risk settings in the sole setting of a "crowded, outdoor setting" among participants who used a barrier method that did not wear a face mask in a high-risk setting. Among the group of participants that used barrier methods in the 12 months prior to the administration of the questionnaire, there was a 95% chance that they would wear a face mask in both a crowded, well-ventilated indoor setting and a crowded, poorly-ventilated indoor setting. Related to a physically-distanced, well-ventilated indoor setting, there was an 84% chance of face mask use and a 70% chance in a physically-distanced, poorly-ventilated indoor setting among barrier method users. Though there were high probabilities of face mask use in these indoor settings, when comparing face mask use in crowded, well-ventilated poorly-ventilated indoor settings and physically-distanced, well-ventilated to poorly-ventilated indoor settings, there was no statistical significance for increased face mask use between the paired settings. There were differences in outdoor and home settings due to physical distancing and relation by cohabitation. When comparing a crowded outdoor setting to a physically-distanced outdoor setting, participants were more likely to wear a face mask in a crowded setting and this difference was statistically significant. When referring to periods of time that a participant shared space within their home with someone else, there were

differences in face mask use when that person was a member of the household or not which could have influenced the decision to wear a face mask due to exposure risk.

A separate chi-square test for the entire data set of high- and average-risk settings demonstrated an inverse conclusion between face mask use “At home only with those in your household” and “At home not with those in your household” as there was a higher probability when participants were with those within their household (78% vs 22%). The findings did not indicate the assumptions of the researcher because there was a high frequency of participants who wore face masks when in the company of those whom they did not cohabitate with which has a higher risk of exposure than those from their household. The reason for this conclusion could be that the answer choice could have been confusing, the fear of exposure to cohabitants could be perceived to be higher than those whom they did not live with, or this could have been a true reflection of actions based on the knowledge of the participants. There was not an ability to find out the source of this difference but in future studies, the knowledge of CDC guidelines and the risks due to the varied factors within settings should be explored to test the validity of these data.

**Table 8. Hypothesis 1: Research Question 3**

| **Face Mask Use Frequency in High-Risk Settings Compared by Barrier Method Use (n=124)** | | | | | | |
|---|---|---|---|---|---|---|
| | **Face Mask Use in a High-Risk Setting, Yes** | | **Face Mask Use in a High-Risk Setting, No** | | | |
| **Variable** | ***n*** | **%** | ***n*** | **%** | **x^2** | ***P*-value** |
| Crowded, poorly-ventilated indoor setting | | | | | | |
| Used a barrier method | 72 | 61 | 3 | 50 | 0.29 | 0.59 |
| Did not use a barrier method | 46 | 39 | 3 | 50 | | |
| Physically-distanced, poorly-ventilated indoor setting | | | | | | |
| Used a barrier method | 72 | 58.1 | 17 | 70.8 | 1.33 | 0.25 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Did not use a barrier method | 52 | 41.9 | 7 | 29.2 | | |
| Crowded, outdoor setting | | | | | | |
| Used a barrier method | 55 | 56.1 | 29 | 82.9 | 7.92 | 0.004 |
| Did not use a barrier method | 43 | 43.9 | 6 | 17.1 | | |
| At home with those not in your household | | | | | | |
| Used a barrier method | 20 | 57.1 | 55 | 61.8 | 0.23 | 0.63 |
| Did not use a barrier method | 15 | 42.9 | 34 | 38.2 | | |

*Note.* "High-Risk" status was applied to four out of the eight settings based on their ventilation quality, space capacity, or close proximity to those outside of the household of participants. This risk represents a higher probability of spreading COVID-19 and makes these settings safer with the use of a face mask.

After comparing the three tests completed to accurately analyze Hypothesis 1, a conclusion can be made that vaccination status, face mask use, and barrier method use cannot be accurately correlated for a higher or lower probability of socially and sexually protective behaviors. This is due to the various reasons, conditions, and pressures to use both face masks and barrier methods that are individual decisions. Further research should be conducted to analyze the qualitative reasoning for face mask and barrier method use within this population based on access to accurate information and the products in question.

**Hypothesis 2**

The researcher hypothesized that underclassmen status (first- to second-year academic classification) would be associated with comfort in talking with a non-monogamous partner about barrier method use. The hypothesis was tested with a two-sample t-test assuming unequal variances comparing the comfort of participants separated into groups of underclassmen (first- to second-year) and upperclassmen (third- to fifth-year). Referring to Table 9, the mean of underclassmen students who were comfortable with barrier method communication was 1.24 though the majority of participants in this group left the answer blank. Among the participants who left the answer blank, all of them were first-year students and that

could be a result of voluntary omission or a lack of experience with non-monogamous partners at that stage of life. When surveyed for the 2005 and 2011 Online College Social Life Survey, 37% and 39% of female-identifying and 40% and 46% of male-identifying first- and second-year students indicated having intercourse outside of a monogamous relationship while 49% and 53% of female-identifying and 50% and 53% of male-identifying third- and fourth-year students had these experiences (Bearak, 2014, p. 489). The p-value was 0.005 which indicated high statistical significance when compared to the alpha level of 0.05. Hypothesis 2 was incorrect in predicting that the correlation between underclassmen and comfort would be positive but there was an indication that this correlation was present for upperclassmen within the sample. Referring to Table 9 that displays the findings of Hypothesis 2, affirmative comfort in talking about barrier method use or "Yes" was indicated by 1 and opposing comfort in talking about barrier method use or "No" was indicated by 2 so the values range from 1-2.

The limitation of this finding was that the majority of the first-year students did not correctly answer the question and could have increased the proportion of comfort in talking about barrier method use if they had previously had experience with this type of partner and/or indicated their true comfort level to better reflect the underclassmen population.

**Table 9. Hypothesis 2**

| **Comfort in Barrier Method Communication with Non-Monogamous Partner** | | |
|---|---|---|
| **Academic Classification** | **Mean** | ***P*-value** |
| Underclassmen (n=21) | 1.24 | 0.02 |
| Upperclassmen (n=41) | 1 | |

*Note.* "Mean" is a calculation of averages for dichotomous data indicating "Yes" or "No" that were coded "1" or "2"

### Hypothesis 3

The researcher hypothesized that upperclassmen status (third- to fifth-year academic classification) would be associated with infrequent use of barrier methods and participants

would indicate use “sometimes” or “never.” This hypothesis required the use of data from participants who indicated use “sometimes” or “never” for each barrier method with the exclusion of all others. To find the frequency of use for each method seven t-tests were conducted to determine the correlation between academic classification and barrier method use. External (male) condoms, internal (female) condoms, finger cots/finger condoms, and spermicide alone were the only methods that participants indicated using more than “never” so statistical significance between underclassmen and upperclassmen could only be possible among these methods. None of the barrier methods showed statistical significance between the groups for infrequent barrier method use. All t-tests used the alpha value 0.05 but the four barrier methods accessible for testing had the following p-values that indicated no statistical significance: “External (Male) Condoms” (0.75), “Internal (Female) Condoms” (0.23), “Finger Cots/Finger Condoms” (0.39), and “Spermicide Alone” (0.65). The remaining methods: “Dental Dams,” “Diaphragm with Spermicide,” and “Sponge with Spermicide” were not able to be tested with a two-sample t-test assuming unequal variances because 100% of participants indicated “Never” using each method. Refer to Table 10 for the frequency breakdown for each barrier method type as it correlates to academic classification and is compared by “frequent use” and “infrequent use.” “Frequent Use” was participant indication of “Always,” “Most of the time,” or “About half of the time” and “Infrequent Use” was participant indication of "Sometimes" or "Never." Hypothesis 3 was incorrect but when applied to a wider population than the sample, these data can inform how all undergraduate students become educated on barrier method use without the influence of a current trend of avoidance.

**Table 10. Hypothesis 3**

| **Frequency of Barrier Method Use by Type** | | | |
|---|---|---|---|
| **Barrier Method** | **Frequent Use n (%)** | **Infrequent Use n (%)** | ***P*-value** |
| External (Male) Condom Use | | | |
| Underclassmen (n=41) | 20 (48.9) | 21 (51.2) | 0.75 |
| Upperclassmen (n=83) | 36 (43.4) | 47 (56.6) | |
| Internal (Female) Condom Use | | | |
| Underclassmen (n=41) | 0 (0) | 41 (100) | 0.23 |
| Upperclassmen (n=83) | 1 (1.2) | 82 (98.8) | |
| Finger Cot/Finger Condom Use | | | |
| Underclassmen (n=41) | 1 (2.4) | 40 (97.6) | 0.39 |
| Upperclassmen (n=83) | 0 (0) | 83 (100) | |

*Note.* "Underclassmen" indicates a participant was a 1st or 2nd year undergraduate student; "Upperclassmen" indicates a participant was a 3rd, 4th, or 5th year undergraduate student; “Frequent Use” indicates “Always,” “Most of the time,” or “About half of the time” and “Infrequent Use” indicates "Sometimes" or "Never" which are terms used on a Likert scale to measure barrier method use on the Qualtrics questionnaire that ranged from "Always" to "Never"

Beyond the hypothesis results from the data set, there were additional conclusions made related to each section of the Qualtrics questionnaire. Participants who did not indicate an academic classification or indicated being a “Graduate Student” or “Staff/Faculty” were excluded from the following analysis processes because they did not have access to the questions without answering those required by the Qualtrics system.

**COVID-19 Safety Habits**

The COVID-19 Safety Habits section of the questionnaire created opportunities for results related to handwashing and face mask use. Data collection began six months after the vaccine was made available to the target sample population and the majority of participants were fully-vaccinated though many questions contained retrospective self-reported inquiries

about the previous 12 months that could have reflected habits prior to vaccination. In addition to the hypothesis discoveries related to face mask use, the researcher wanted to explore the rates of handwashing before and after vaccination status changes because of the continued desire to practice handwashing beyond pandemic-era recommendations.

Though handwashing requirements of the use of soap and water for at least 20 seconds was a reminder, this was not a newly acquired practice that was adopted with skepticism by the public. The comparative concepts of face mask use to handwashing needed to be considered differently because of this predisposition for handwashing knowledge. Handwashing data from the unvaccinated (Q4.7) and fully vaccinated (Q4.8) questionnaire items were compared to analyze the differences in amounts of situations that constituted subsequent handwashing before and after fully vaccinated status. Only participants who indicated being fully vaccinated were able to answer this question and be included in the test to ensure data were not skewed by individuals who did not fit the status change at the time of questionnaire engagement. With only six situations to choose between, there were general options available to include common interactions that could trigger handwashing: “Before eating with cutlery/eating utensils;” “Before eating without cutlery/eating utensils;” “After touching a car door, exterior door handle, or interior door handle;” “After interacting with those in your household (roommates, family members, etc.);” “After interacting with friends or family who are not in your household;” and “After interacting with strangers who are not in your household.”

The data showed that eating was the most common reason for handwashing with an 85.4% frequency before vaccination and 81.3% frequency after vaccination across all fully vaccinated participants to wash their hands before eating without cutlery. After eating, interactions with others were common reasons to practice handwashing as closer relation to others decreased the frequency of handwashing: 14.1% after interacting with a household member after vaccination and 61.5% after interacting with a stranger. Unlike with face mask use before and after being fully vaccinated, more participants maintained the same amount (102) of

handwashing situation triggers rather than decreasing that amount (84) after being fully vaccinated. This could be due to the previous acceptance of handwashing as a common practice or the continued desire for sterility when the risk of exposure was present on surfaces and others. On average, 3.82 situations prompted handwashing before vaccination and 3.05 after vaccination which was statistically significant out of six situations with a p-value of <0.001. Table 11 was formatted to provide information on handwashing frequency descriptive statistics, a two-sample t-test assuming unequal variances, a count out of 192 fully vaccinated participants for handwashing changes, and a count for frequency for each situation.

**Table 11. Handwashing Frequency Before and After Fully Vaccinated Status**

| **Frequency of Handwashing Based on Vaccination Status** | | | | | |
|---|---|---|---|---|---|
| **Vaccination Status (n=192)** | **Mean** | **SD** | **CL** | **Variance** | ***P*-value** |
| When unvaccinated | 3.82 | 1.73 | 0.25 | 3 | <0.001 |
| When vaccinated | 3.05 | 1.66 | 0.24 | 2.77 | |
| **Change in Handwashing Frequency After Fully Vaccinated (n=192)** | | | | | |
| Decrease | 84 | | | | |
| Stable | 102 | | | | |
| Increase | 6 | | | | |
| **Frequency of Situation Indication (n=192)** | | | | | |
| | **When unvaccinated** | **When vaccinated** | | | |
| **Situation** | ***n* (%)** | ***n* (%)** | | | |
| Before eating with cutlery/eating utensils | 151 (78.6) | 139 (72.4) | | | |
| Before eating without cutlery/eating utensils | 164 (85.4) | 156 (81.3) | | | |
| After touching a car door, exterior door handle, or interior door handle | 111 (57.8) | 82 (42.7) | | | |

| | | |
|---|---|---|
| After interacting with those in your household (roommates, family members, etc.) | 47 (24.5) | 27 (14.1) |
| After interacting with friends or family who are not in your household | 108 (26.3) | 64 (33.3) |
| After interacting with strangers who are not in your household | 153 (79.7) | 118 (61.5) |

*Note.* “Change” is amount of participants; “Frequency” is amount of situations

**Sexual Behavior**

The Sexual Behavior section included a majority of questions related to barrier method use frequency, correlated form of sex, barrier method use circumstances, and relationship status related to the 12 months prior to the administered questionnaire. Though there were many opportunities for data correlation and analysis within this section, the researcher could not feasibly analyze all the data points especially those that would not directly inform the findings of the overarching topic of the study: barrier method use. An additional test was completed with a general barrier method use question from this section (Q5.8) and sexual identity demographic information (Q3.6).

Table 12 data reflect the prevalence of barrier method use based on sexual identity, but the p-values were based on comparisons between the barrier method use of the entire data set and that specific group’s use (e.g., All barrier method use vs. Heterosexual barrier method use). The comparisons indicated statistical significance for only participants who identified as “Lesbians” with a p-value of 0.006 when compared to the frequency of barrier method use of the entire data set. Within the entire data set, 47.1% of participants used barrier methods in the previous 12 months while “Lesbians" from the 11-participant sample used barrier methods 0% of the time. Though none of the other sexual identity groups demonstrated statistical significance, “Heterosexual” (50.4%), “Bisexual” (55.1%), “Asexual” (50%), and “Unsure or Questioning” (57.1%) groups used barrier methods more than the entire data set. The remainder of the data from the two-sample t-test assuming unequal variances were referenced in Table 12.

**Table 12. Barrier Method General Use in Previous 12 Months by Sexual Identity**

| **Barrier Method Use by Sexual Identity** | | | |
|---|---|---|---|
| **Sexual Identity** | ***n*** | **%** | ***P*-value** |
| **All (n=225)** | | | |
| Used a barrier method | 106 | 47.1 | |
| Did not use a barrier method | 79 | 35.1 | |
| **Heterosexual (n=129)** | | | |
| Used a barrier method | 65 | 50.4 | 0.62 |
| Did not use a barrier method | 40 | 31 | |
| **Gay (n=5)** | | | |
| Used a barrier method | 2 | 40 | 0.17 |
| Did not use a barrier method | 3 | 60 | |
| **Lesbian (n=11)** | | | |
| Used a barrier method | 0 | 0 | 0.006 |
| Did not use a barrier method | 10 | 90.9 | |
| **Bisexual (n=49)** | | | |
| Used a barrier method | 27 | 55.1 | 0.57 |
| Did not use a barrier method | 17 | 34.7 | |
| **Pansexual (n=9)** | | | |
| Used a barrier method | 4 | 44.4 | 0.07 |
| Did not use a barrier method | 5 | 55.6 | |
| **Asexual (n=4)** | | | |
| Used a barrier method | 2 | 50 | 0.68 |
| Did not use a barrier method | 1 | 25 | |

| | | | |
|---|---|---|---|
| **Queer (n=6)** | | | |
| Used a barrier method | 1 | 16.7 | 0.42 |
| Did not use a barrier method | 2 | 33.3 | |
| **Unsure or Questioning (n=7)** | | | |
| Used a barrier method | 4 | 57.1 | 0.26 |
| Did not use a barrier method | 1 | 14.3 | |
| **Other (Please specify) (n=1)** | | | |
| Used a barrier method | 1 | 100 | N/A |
| Did not use a barrier method | 0 | 0 | |

*Note.* "P-value" is a data comparison between all participants and single sexual identity groups ("Heterosexual," "Gay," etc.) not between affirmative and opposing barrier method use by sexual identity group; Values of "*n*" and percentages may not calculate to 225 or 100% because some of the eligible 225 participants left blank responses or indicated "I do not know"

This does not mean to correlate that any specific group is "safer" than others but hopes to influence more studies on how identity impacts knowledge and practice of risk exposure reductions. Future research could be based on barrier method prevalence, dispelling safer sex hesitancy, and using more concentrated sexual health education efforts to impact these groups and reduce the risk of contracting STIs regardless of sexual identity and stigma. Due to the various partnerships and forms of sex that impact how sexual activity is defined, limited knowledge on the diverse benefits of barrier methods for safer sex is sometimes not expanded on for marginalized sexual identities, and if they are, it is not without erasure or stigmatization. These findings could be applied to the educational efforts of campus efforts that work to better promote barrier method use beyond sole contraceptive use due to the varied combinations of sexually active individuals and reasons for barrier method use.

The Qualtrics questionnaire inquired about the reasoning for affirmative and opposing barrier method use to better contextualize the data collected and the findings were referenced in

Tables 13 and 14. The two questions asked participants who engaged in some form of sexual behavior in the previous 12 months what were the reasons they did and did not use a barrier method in the past. Table 13 refers to the question that provided six possible reasons and one open-ended option for the participants to indicate the most (1) to least (7) important reasons why they used a barrier method (Q5.30) and Table 14 included seven possible reasons and one open-ended option to rank why they did not use a barrier method (Q5.31). The most frequent reason ranked first for affirmative use was “To prevent pregnancy” while the most frequent reason ranked first for opposing use was “To use a long-acting, hormonal, or permanent contraceptive instead.” The reason ranked last for both questions (“7th” in Table 13 and “8th” in Table 14) was “Other (Please specify)” which included a majority of default omission of writing a response, but all responses given for were not correlated to the last place ranking which indicated intentionality of response. For affirmative use, the most common responses for why participants indicated “Other (Please specify)” were ever engaging in sex or never using a barrier method. For opposing use, the most common responses were engagement in sexual behavior that did not include penile-vaginal penetration and personal identification as a “Lesbian.” These findings were not compared to any other conclusions, but they provided more context to the other conclusions of this study related to barrier method use and communication comfort.

**Table 13. Frequency by Ranking of Reason for Affirmative Barrier Method Use**

| **Frequency of Each Reason for Barrier Method Use Ranked 1st to 7th (n=124)** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Reason** | **1st (*n*)** | **2nd (*n*)** | **3rd (*n*)** | **4th (*n*)** | **5th (*n*)** | **6th (*n*)** | **7th (*n*)** |
| To prevent pregnancy | **93*** | 15 | 7 | 4 | 0 | 0 | 5 |
| To prevent a sexually transmitted infection (STI) | 17 | **65*** | 23 | 13 | 4 | 2 | 0 |
| A recent positive STD test for yourself and/or your sexual partner | 2 | 6 | 15 | 22 | 19 | **48*** | 12 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Pressure from your sexual partner to use a barrier method | 0 | 6 | 24 | **33*** | 30 | 25 | 6 |
| To have a sexual interaction with a non-monogamous sexual partner | 3 | 7 | 24 | 22 | **33*** | 27 | 8 |
| To use as an alternative to a long-acting, hormonal, or permanent contraceptive | 1 | 24 | **28*** | 25 | 27 | 15 | 4 |
| Other (Please specify) | 8 | 1 | 3 | 5 | 11 | 7 | **89*** |

*Note.* (*) indicates most frequently selected reason for each ranking from 1st to 7th

**Table 14. Frequency by Ranking of Reason for Opposing Barrier Method Use**

| **Frequency of Each Reason for Not Using Barrier Method Ranked 1st to 8th (n=124)** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Reason** | **1st (*n*)** | **2nd (*n*)** | **3rd (*n*)** | **4th (*n*)** | **5th (*n*)** | **6th (*n*)** | **7th (*n*)** | **8th (*n*)** |
| The preferred barrier method was not available | 10 | 21 | 24 | 17 | 21 | 21 | 8 | 2 |
| To engage in an unexpected/unanticipated sexual interaction | 17 | 18 | **35*** | 24 | 17 | 8 | 4 | 1 |
| You and your sexual partner are not worried about pregnancy and/or STIs | 14 | 22 | 23 | **29*** | 13 | 12 | 10 | 1 |
| A recent negative STI test for yourself and/or your sexual partner | 5 | 9 | 6 | 22 | **34*** | **32*** | 12 | 4 |
| Pressure from your sexual partner to not use a barrier method | 8 | 6 | 3 | 2 | 20 | 25 | **54*** | 6 |
| To have a sexual interaction with a monogamous sexual partner | 27 | **25*** | 17 | 15 | 9 | 12 | 17 | 2 |
| To use a long-acting, hormonal, or permanent contraceptive instead | **38*** | 21 | 15 | 13 | 6 | 11 | 14 | 6 |
| Other (Please specify) | 5 | 2 | 1 | 2 | 4 | 3 | 5 | **102*** |

*Note.* (*) indicates most frequently selected reason for each ranking from 1st to 8th

### Barrier Method Communication

The Barrier Method Communication section consisted of final questions related to barrier method use and the communication surrounding it related to previous experience communicating, comfort with barrier method communication with types of sexual partners, barrier method dissuasion (when a sexual partner influences someone to not use a barrier method) with pressure or threats, and how participants defined consent in relation to barrier

method communication inclusion. These questions were posed to analyze reasoning for barrier method use or not based on previous sections and how the influence of others could impact those decisions. The researcher conducted a chi-square test of independence to find a correlation between experience with intimidation-based barrier method dissuasion (Q6.4) and the inclusion of barrier method communication in the definition of consent (Q6.5). Participants were given the following explanation of consent to best educate them before answering a question about their personal considerations of consent: “Consent is the clear, enthusiastic, and informed exchange between individuals as they talk about specific forms of sexual activity with the knowledge that all agreements are reversible without threat of manipulation.” The researcher wanted to test if there was statistical significance between individuals who had experienced pressure or threats from a sexual partner to not use a barrier method and if that correlated to inclusion of clear communication about barrier method use as a part of the process of consent. The test revealed that 100% of participants who had been pressured or threatened indicated the inclusion of barrier method use in the definition of consent and 67.5% of participants who had not been pressured or threatened included it as well. This demonstrates statistical significance from a p-value of $<0.001$ and even those without a connection to dissuasion indicated the value of barrier method use communication within the realm of consent. The data in Table 15 reflects only those who responded to both questions out of the 224 eligible participants which excluded those with incompatible academic classifications and did not answer one or both questions.

**Table 15. Impact of Barrier Method Use Dissuasion on Inclusion of Barrier Method Communication in Definition of Consent**

| **Barrier Method Use Dissuasion Influencing Consent Definition** | | | | | | |
|---|---|---|---|---|---|---|
| | **Included in Definition** | | **Excluded from Definition** | | | |
| **Barrier Method Use Dissuasion** | ***n*** | **%** | ***n*** | **%** | **x^2** | ***P*-value** |
| Pressured/Threatened, Yes (n=45) | 45 | 100 | 0 | 0 | 12.65 | <0.001 |
| Pressured/Threatened, No (n=126) | 85 | 67.5 | 26 | 14.9 | | |

*Note.* "Pressured/Threatened, Yes" or "Pressured/Threatened, No" indicate previous experience with a sexual partner dissuading barrier method use with pressure or threats; "Included in Definition" and "Excluded from Definition" are indicative of participants who included or excluded barrier method communication from their personal definition of consent; Values of “n” and percentages may not calculate to 225 or 100% because some of the eligible 175 participants indicated “I do not know"

**Data Comparison: Campus Wellness Assessment**

Appalachian State University conducts a Campus Wellness Assessment every two years to probe the wellness status, needs, and concerns of students for the development of future educational, clinical, and systemic supports. Sexual health data collected from the 2019 Campus Wellness Assessment (CWA) referenced experiences of the 3 months prior to questionnaire administration while this study collected retrospective data from the previous 12 months. Though this was a discrepancy between the two data sets, the variations in data conclusions were also between pre- and post-pandemic events that make all circumstances of findings abnormally different.

The questions from the CWA that were referenced in this analysis were displayed in Table 16. This comparative dataset served as a baseline of sexual behavior practice among the same undergraduate cohort before and after the onset of the COVID-19 pandemic in March 2020. Similar to the many tests related to the Qualtrics questionnaire, only data from

undergraduate students were utilized from the CWA, reducing the sample count from 1557 to 1463 participants.

**Table 16. Selected Questions from 2019 Campus Wellness Assessment and 2021 Qualtrics Questionnaire Paired by Comparison**

| 2019 Campus Wellness Assessment | 2021 Qualtrics Questionnaire |
|---|---|
| Q54. In the past 3 months, have you been sexually active? (including vaginal, oral, and/or anal sex)<br>○ Yes<br>○ No | Q5.5. In the past 12 months, what forms of sexual activity have you engaged in?<br>○ No sexual interactions<br>○ Oral (mouth to genitals contact)<br>○ Vaginal (penis/sex toy to vagina contact)<br>○ Anal (penis/sex toy to anus contact)<br>○ Finger/Hand Contact (finger/hand to genitals/anus contact - also known as "fingering" or "hand job")<br>○ Mutual Masturbation (stimulation of one's own genitals) (Note: Indicate only if stimulation is generated from sex toy shared between sexual partners)<br>○ Genital Humping/Rubbing (genital to genital contact) |
| Q55. In the past 3 months, during sexual activity which of the following barrier methods have you used to prevent the transmission of sexually transmitted infections (STIs)?<br>○ Male/external condoms<br>○ Female/internal condoms<br>○ Dental/oral dams<br>○ Finger cots/gloves<br>○ No barriers utilized<br>Q56. In the past 3 months of sexual activity, which of the following contraceptive methods have you utilized to prevent pregnancy? (select all that apply)<br>○ Depo-Provera "the shot"<br>○ Emergency contraceptive (e.g., Plan B)<br>○ Intrauterine device (IUD) or Nexplanon "the implant"<br>○ Male/Female condoms<br>○ NuvaRing<br>○ Oral pills "the pill"<br>○ Withdrawal "pullout method"<br>○ Not applicable<br>○ No contraceptive utilized | Q5.8, In the past 12 months, have you used any type of barrier method when engaging in any form of sexual activity?<br>○ Yes<br>○ No<br>○ I do not know |

The sexually active question (Q54) from the CWA referenced any sexual activity from the previous 3 months as it was compared to the Qualtrics questionnaire that defined six forms of sex and an omission of sexual interactions from the previous 12 months (Q5.5). These data were made available for comparison by coding all data from the Qualtrics questionnaire that indicated any combination of sex other than "No sexual interaction" as being sexually active and "No sexual interaction" as not being sexually active which reflected the CWA data. After conducting a two-sample t-test assuming unequal variances, there was statistical significance with a p-value of <0.001 in favor of participants of the Qualtrics questionnaire being sexually active at a higher rate in 2021 than those of the CWA in 2019. Sexually active undergraduate students made up 83.1% of the Qualtrics sample and 59.7% of the CWA sample. It must be considered that individuals engaging with the Qualtrics questionnaire knew the study was about sexual activity so those who had not engaged in sexual activity in the previous 12 months may not have been as motivated to engage. Refer to Table 17 for more specific information on the sexually active undergraduate cohort as they compare in 2019 and 2021.

**Table 17. Prevalence of Sexually Active Undergraduate Students in 2019 and 2021 Data**

| **Engagement in General Sexual Activity** | | | | |
|---|---|---|---|---|
| | **Sexually Active, Yes** | **Sexually Active, No** | | |
| **Questionnaire** | ***n* (%)** | ***n* (%)** | **Mean** | ***P*-value** |
| 2019 Campus Wellness Assessment (n=1463) | 874 (59.7) | 544 (37.2) | 1.34 | <0.001 |
| 2021 Qualtrics Questionnaire (n=225) | 187 (83.1) | 11 (4.9) | 0.93 | |

*Note.* "Mean" is a calculation of averages for dichotomous data indicating "Yes" or "No" that were coded "1" or "2"; Values of "n" and percentages may not calculate to the whole sample amount or 100% because some of the participants left blank responses

The contraceptive (Q55) and barrier method (Q56) questions from the CWA referenced sexually protective product use from the previous 3 months as the data were compared to the Qualtrics questionnaire that simply asked participants if they used any form of barrier methods

in the previous 12 months (Q5.8). As this analysis was demonstrated with two tables (Table 18 and 19), take note that the Qualtrics questionnaire data in both tables reference the same question while the CWA data reflects two separate questions. The CWA contraceptive data intended to find out the method used for pregnancy prevention alone and the only methods that were transferable to this study were external (male) condoms and internal (female) condoms. Thus, for data analysis, any sole or combined indication of either barrier method was coded as affirmative barrier method use and any other contraceptive methods or "No contraceptive utilized" were coded as opposing barrier method use which could then be compared to the Qualtrics questionnaire data. The CWA barrier method data were made available for comparison by coding all data that indicated any barrier method use as affirmative barrier method use and "No barriers utilized" as opposing barrier method use. After conducting a two-sample t-test assuming unequal variances for the CWA data, there were no large differences among participants who did not engage in contraceptive and barrier method use between 2019 and 2021 but there was statistical significance with a p-value of <0.001 for both data sets that be represented the large differences in affirmative contraceptive and barrier method use. Refer to Tables 18 and 19 to find the specific data points of comparison.

**Table 18. Prevalence of Barrier Method Use as Contraception Undergraduate Students in 2019 and 2021 Data**

| **Barrier Method Use as Contraception** | | | | |
|---|---|---|---|---|
| | **Barrier Method Used, Yes** | **Barrier Method Used, No** | | |
| **Questionnaire** | ***n* (%)** | ***n* (%)** | **Mean** | ***P*-value** |
| 2019 CWA (n=1463) | 277 (18.9) | 576 (39.4) | 0.97 | <0.001 |
| 2021 Qualtrics Questionnaire (n=225) | 106 (47.1) | 79 (35.1) | 1.19 | |

*Note.* "Mean" is a calculation of averages for dichotomous data indicating "Yes" or "No" that were coded "1" or "2"; Values of "n" and percentages may not calculate to the whole sample amount or 100% because some of the participants left blank responses

**Table 19. Prevalence of Barrier Method Use as STI Prevention Undergraduate Students in 2019 and 2021 Data**

| **Barrier Method Use as STI Prevention** | | | | |
|---|---|---|---|---|
| | **Barrier Method Used, Yes** | **Barrier Method Used, No** | | |
| **Questionnaire** | ***n* (%)** | ***n* (%)** | **Mean** | ***P*-value** |
| 2019 CWA (n=1463) | 290 (19.8) | 573 (39.2) | 0.79 | <0.001 |
| Qualtrics Questionnaire (n=225) | 106 (47.1) | 79 (35.1) | 1.19 | |

*Note.* "Mean" is a calculation of averages for dichotomous data indicating "Yes" or "No" that were coded "1" or "2"; Values of "n" and percentages may not calculate to the whole sample amount or 100% because some of the participants left blank responses

**Data Comparison: Condom Fairy**

The Appalachian State University free barrier method distribution service called the Condom Fairy was utilized for data comparison to divulge the barrier method requests of undergraduate students from 2019 to 2020 as compared to those reported in the Qualtrics questionnaire. The Condom Fairy data needed to be modified for translational comparison so any data beyond the field of inquiry from March 13th, 2019 to March 13th, 2020, which was a rough indication of the COVID-19 pandemic and exclusion of graduate student requests. Referring to Table 21, 41 participants did not answer the barrier method questions out of the 225 eligible participants from the Qualtrics questionnaire. The data from each source were not analyzed for statistical significance but as a count of how many students requested barrier methods before the onset of the COVID-19 pandemic compared to those that indicated barrier method use in the Qualtrics questionnaire. Referring to Table 20, each barrier method was indicated by type and how many students requested them, but external (male) condoms have 11 titles (brands and subtypes of external (male) condoms) to cater to the needs of those who enjoy their qualities, and those counts were also displayed. The combined count of all external (male) condoms was a combined request rate of all 11 titles which increased the student count to 11671 possible requests. The Condom Fairy data revealed that external (male) condoms

were the most requested barrier method (26.3%), and the most common title was “Super Sensitive” (45.3%). The Qualtrics questionnaire revealed that external (male) condoms were also the most used barrier method in the previous 12 months at 61.4% of participants but spermicide was the second most common at 3.8% of participants. The information about each requested method and title and used method type can be valuable when designing barrier method distribution programs and how to educate students on the value of all methods based on their individual needs. Refer to Tables 20 and 21 for misinformation on the comparative 2019-2020 and 2020-2021 data on barrier method types.

**Table 20. Prevalence of Barrier Method Requests from the Condom Fairy (March 13, 2019 - March 13, 2020)**

| **Prevalence of Barrier Method Requests by Type and Title (n=1061)** | | |
|---|---|---|
| **Barrier Method** | ***n*** | **%** |
| **External (Male) Condom:** | | |
| Yes | 1017 | 95.9 |
| No | 44 | 4.1 |
| **Trojan ENZ Condoms** | | |
| Yes | 454 | 42.8 |
| No | 607 | 57.2 |
| **Super Stud Condoms** | | |
| Yes | 355 | 33.4 |
| No | 706 | 66.5 |
| **Flavored Condoms** | | |
| Yes | 250 | 23.6 |
| No | 811 | 76.4 |
| **Non-Lubricated Condoms** | | |

| | | |
|---|---|---|
| Yes | 12 | 1.1 |
| No | 1049 | 98.9 |
| **Atlas XL Condoms** | | |
| Yes | 151 | 14.2 |
| No | 910 | 85.8 |
| **The Legend Condoms (XL)** | | |
| Yes | 189 | 17.8 |
| No | 872 | 82.2 |
| **Super Sensitive Condoms** | | |
| Yes | 481 | 45.3 |
| No | 580 | 54.7 |
| **Glow in the Dark Condoms** | | |
| Yes | 471 | 44.4 |
| No | 590 | 55.6 |
| **Classic Select Condoms** | | |
| Yes | 401 | 37.8 |
| No | 660 | 62.2 |
| **Latex-Free Condoms** | | |
| Yes | 124 | 11.7 |
| No | 937 | 88.3 |
| **Colorful Condoms** | | |
| Yes | 185 | 17.4 |
| No | 876 | 82.6 |
| **Dental Dam:** | | |

| | | |
|---|---|---|
| Yes | 80 | 7.5 |
| No | 981 | 92.5 |
| **Finger Cot/Finger Condom:** | | |
| Yes | 68 | 6.4 |
| No | 993 | 93.6 |

**Table 21. Prevalence of Barrier Method Use by Type from Qualtrics Questionnaire**

| **Prevalence of Barrier Method Use by Type (n=184)** | | |
|---|---|---|
| **Barrier Method Use** | ***n*** | **%** |
| **External (Male) Condom Use** | | |
| Yes | 113 | 61.4 |
| No | 71 | 38.1 |
| I do not know | 0 | 0 |
| **Internal (Female) Condom Use** | | |
| Yes | 2 | 1.1 |
| No | 182 | 97.8 |
| I do not know | 0 | 0 |
| **Dental Dam Use** | | |
| Yes | 1 | 0.5 |
| No | 182 | 97.8 |
| I do not know | 1 | 0.5 |
| **Finger Cot/Finger Condom Use** | | |
| Yes | 2 | 1.1 |
| No | 181 | 77.3 |
| I do not know | 1 | 0.5 |

| | | |
|---|---|---|
| **Spermicide Alone Use** | | |
| Yes | 7 | 3.8 |
| No | 174 | 93.5 |
| I do not know | 3 | 1.6 |
| **Diaphragm with Spermicide Use** | | |
| Yes | 1 | 0.5 |
| No | 182 | 97.8 |
| I do not know | 1 | 0.5 |
| **Sponge with Spermicide Use** | | |
| Yes | 0 | 0 |
| No | 184 | 98.9 |
| I do not know | 0 | 0 |

The Condom Fairy order request database allowed for additional inquiries related to the reasoning for requesting barrier methods and the researcher categorized the responses for easier tabulation. Categories were labeled for the following reasons: “Appreciation for the Condom Fairy” - comments of support and thanks; “Privacy/Discretion” – a desire for barrier methods without judgment; “Safer Sex” - used terms like ‘safe sex’; “Sexually Active” - acknowledged current sexual engagement; “Request for Event/Influence of Position” - needed barrier methods for event or position; “STI/STD Prevention” - desire to protect against STIs/STDs; “Pregnancy Prevention” - desire to protect against unplanned pregnancy; “Affordable/Cheap/Free” – a desire for barrier methods at little to no cost; “Easy/Accessible” - described service as easy to access; “Non-Answer” - comments to the likeness of ‘N/A’; “Blank” - respondent did not answer the question. Referring to Table 22, respondents indicated using the Condom Fairy service most commonly for “Safer Sex” and because it was

"Affordable/Cheap/Free." This reasoning represents 12 months of order requests that in addition to their true desires for use, the service was advertised as a free way to engage in safer sex, and this could have influenced participants to answer the question accordingly.

**Table 22. Condom Fairy Request Reason by Category (March 13, 2019 - March 13, 2020)**

| **"Why do you utilize the Condom Fairy?" (n=555)** | |
|---|---|
| **Reason Category** | ***n*** |
| Appreciation for the Condom Fairy | 13 |
| Privacy/Discretion | 4 |
| Safer Sex | 198 |
| Sexually Active | 25 |
| Request for Event/Influence of Position | 10 |
| STI/STD Prevention | 11 |
| Pregnancy Prevention | 27 |
| Affordable/Cheap/Free | 122 |
| Easy/Accessible | 39 |
| Non-Answer | 8 |
| Blank | 98 |

*Note.* "Request for Event/Influence of Position" indicates individual used Condom Fairy to supply sexual health event or their position (e.g., Graduate Assistant) influenced their need to supply barrier methods

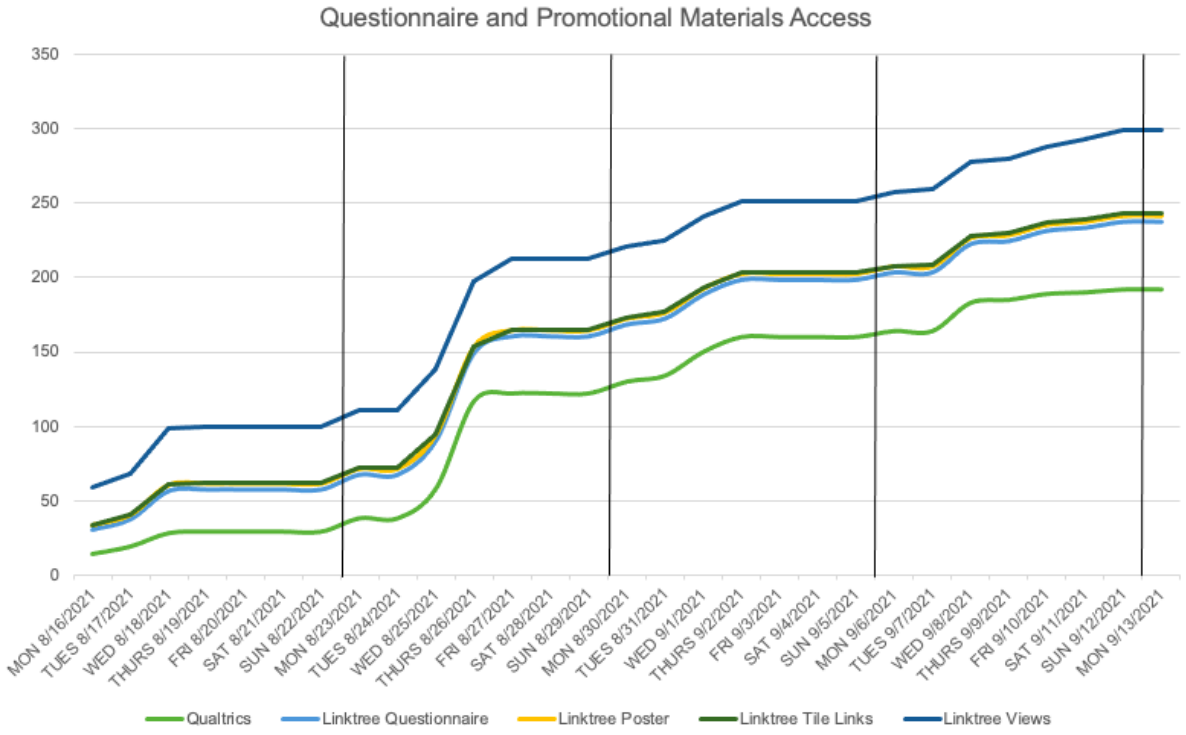
**Promotional Material Efficacy**

The researcher used various methods to share the questionnaire with prospective participants and the efficacy of these methods was tested with a log of engagement on Qualtrics as it correlates to what methods were used for the four-week promotional campaign. This evidence included how many times individuals accessed the researcher's Linktree to find the questionnaire, promotional flyer (See Appendix A), or information sheet for the social media "tiles" (See Appendix C). These data were compared to the amount of completed surveys after social media posts, university-affiliated promotion, and the mass email of 1000 undergraduate students to explore how effective these methods were for participant engagement which could inform future research for this population. Each week, social media tiles were posted to the researcher's Instagram and Facebook that included information on sexual health, barrier methods, STI testing, and related resources on Mondays and Fridays and an encouragement message to engage with the questionnaire on Wednesdays (See Appendix B). A Linktree page was available in the bio of the researcher's Instagram and Facebook accounts to provide access to the promotional materials and questionnaire for prospective participants with the Qualtrics questionnaire, promotion flyer, resource link page categorized for each social media tile post. No posts were made on weekends except for the final weekend of the campaign which shared encouragement posts, a countdown for the closing of the questionnaire, and a resource flyer after the questionnaire closed (See Appendix D). Additional efforts on other social media sites, personal and professional connections that shared the promotional flyer, and word-of-mouth advertising functioned as other efforts for prospective and actual participant engagement.

Graph 2 includes data from each day of the promotional campaign based on access to the Qualtrics Questionnaire (See Appendix E), the researcher's Linktree page, and Linktree links to the questionnaire, the study's promotional flyer, and the document with more information on resources shared in the social media tile posts. As visualized by Graph 2, there were large increases in Qualtrics questionnaire engagement after the original IRAP email and two

subsequent email reminders to a sample of 1000 undergraduate students on August 26th, September 2nd, and September 8th, 2021. There was also a 20-person increase for the questionnaire after the affiliated university's Honors College Newsletter promoted the questionnaire with a study summary and promotional flyer. Regarding the Linktree-related links, there were steady increases throughout the four-week campaign without substantial spikes from any particular effort.

**Graph 2. Questionnaire and Promotional Materials Access from Prospective and Actual Participants**




In the questionnaire, there was a question about what source was used to access the survey and this was an additional data point related to participant engagement. The data showed that the majority of participants accessed the questionnaire by receiving a link in an email (52.4%) which can include individuals contacted through the IRAP mass email or from other emails sent by the researcher to those with access to groups of undergraduate students. Refer to Table 23 for the source access data.

**Table 23. Sources Used to Access the Questionnaire**

| **Prevalence of Source Access (n=225)** | | |
|---|---|---|
| **Source** | ***n*** | **%** |
| I received an email and clicked the link | 118 | 52.4 |
| I followed a link on social media | 39 | 17.3 |
| I used a link shared by an organization or professor | 12 | 5.3 |
| Other (Please specify) | 3 | 1.3 |
| Blank | 53 | 23.6 |

The Barrier Method Communication section of the questionnaire included a question about the survey's impression on respondents based on their knowledge of barrier method use communication. The response options were, "More comfortable than before starting this survey;" "Same level of comfort as before starting this survey;" "Less comfortable than before starting this survey;" and "I do not know." The object of this study was not education but through the educational materials and resources shared in the promotional campaign, this was an inquiry that did not need to demonstrate statistical significance to give a glimpse of how this study advanced personal sexual health literacy. The data from this question demonstrated 63.1% of participants experienced the same level of comfort in talking about barrier method use with sexual partners as before the start of the survey. Refer to Table 24 for more insight into participant post-questionnaire comfort levels.

**Table 24. Barrier Method Communication Comfort of Participants After Questionnaire**

| **Post-Questionnaire Comfort with Barrier Method Communication (n=225)** | | |
|---|---|---|
| **Comfort Level** | ***n*** | **%** |
| More comfortable than before starting this survey | 28 | 12.4 |
| Same level of comfort as before starting this survey | 142 | 63.1 |
| Less comfortable than before starting this survey | 1 | 0.4 |
| I do not know | 3 | 2.7 |
| Blank | 51 | 22.7 |

## Discussion

Undergraduate students are amidst personal and academic transitions that can impact how they interact with others within the “emerging adulthood” period. This study intended to probe a sample of participants experiencing the changes of an undergraduate career on their sexual behaviors and habits while experiencing the pressures of the COVID-19 pandemic. The questionnaire recorded sexual behaviors in sexual relationships whether monogamous or non-monogamous because undergraduates could be most accurately represented by a diversity of relationship types. It also asked students about practices related to the COVID-19 pandemic. All hypothesis tests intended to correlate the increased cognizance of safety amidst a global pandemic to an increased knowledge and/or practice of limited sexual risk-taking among a group of individuals living in close proximity and experiencing an explorational period within adulthood.

Overall, the findings did not prove concrete associations between the sexual habits of students and their behaviors related to the COVID-19 pandemic. These findings can nonetheless serve as preliminary data for longitudinal analyses of this age cohort as the social

norms, stressors, and opportunities of the pandemic fluctuate and stabilize in the coming years for the emerging adult group.

**Summary of Findings**

Hypothesis 1 proposed that face mask use would be correlated to barrier method use when tested with the following comparisons: face mask use before and after vaccination, fully vaccinated status and affirmative barrier method use, and barrier method use and face mask use in high-risk settings. Hypothesis 1 was rejected because statistical significance was only found in the face mask use before and after vaccination and barrier method use and face mask use in crowded, outdoor settings. This hypothesis was also rejected because of the overall limited ability of translatable conclusions from the questionnaire when correlating socially protective practices to sexually protective practices and vice versa because of the individuality of both decisions.

Hypothesis 2 was rejected because comfort with non-monogamous partners was not correlated to underclassmen academic classification but inversely correlated to upperclassmen classification. The majority of the first-year students did not provide a response, which skewed the distribution of data for second-year students for a correlation of comfort or discomfort with this type of sexual partner. The larger number of sampled upperclassmen demonstrated a mean of 1, which was a “Yes” on a scale of 1 to 2 (“Yes” to “No”) for this question. The findings that rejected the hypothesis also indicated a higher probability of comfort for upperclassmen with non-monogamous partners which could be based on more relationship experience, communication confidence, or other influencing factors.

Hypothesis 3 was rejected because the upperclassmen classification was not associated with infrequent use of barrier methods based on the few participants who used a method other than an external (male) condom. This comparison intended to inform educational efforts of undergraduate students by classification on the value of barrier methods among the developing behaviors referenced by the Online College Social Life Survey that predicted more non-

monogamous sexual partners among upperclassmen (Bearak, 2014, p. 489) that could warrant increased safer sex precautions.

Designing the inquiries about COVID-19 safety guideline habits in response to interpersonal and environmental situations was intended to influence participants to think more about why they engaged than how frequently they engaged in the practice. Due to the polarizing nature of many COVID-19 safety guidelines, there was a necessary caution taken in questionnaire authorship because of the increased risk for participants to abandon the questions or omit their responses due to apprehension to answering truthfully about socially protective practices. The comparisons made for face mask use and handwashing attempted to explain the frequency of conscious personal protection and what incited that response from the group that often engages in risky behaviors. The results of the tests caused the researcher to additionally question the comprehensive understanding of risk by participants based on the responses they gave and the initially assumed trends for social protection. Future research could question a similar sample about what was perceived to be a setting for high and low risk for exposure for COVID-19 before questioning why they engage in face mask use and handwashing. This additional questioning could more accurately explain results where participants wore face masks and washed their hands more frequently when with those within their household than with strangers. Overall, participants wore face masks and washed their hands regardless of vaccination status, setting, and situation which was promising after at least 16 months from the onset of the COVID-19 pandemic.

The primary investigation of barrier method use among undergraduate students was quantified inquiries for the general and specific use of barrier methods by type. 57% of participants indicated use for any type of barrier method in the previous 12 months. This majority was representative of not only the knowledge of barrier methods but access, reason, and priority which are essential in any health-related decision. When asked about specific types of barrier methods, the majority of participants indicated external (male) condoms were the most

frequently used barrier method (61.4%) and this could be due to free on-campus access, the popularity of use, or the association of safer sex with sexual behaviors that center around a penis or sex toy. These findings can inform the health education efforts of college campuses that inquire about barrier method knowledge compared to hormonal and long-term contraceptive methods that are also used by this population. The frequency of barrier method use can influence perception and acceptance of sexual health education efforts based on a population's present engagement with products like these or not. Within the confines of an undergraduate research project and the limited experience of the researcher, more comprehensive findings were not found that better analyzed the whole of the data, but similar questions should be used to further inquire about the sexual health of undergraduate students.

The barrier method communication section was intended to provide interpersonal reasoning for barrier method use based on the history of communication practices with different types of partners. History of barrier method dissuasion, comfort with partners, and definitions of consent can influence why and how often individuals engage in sexually protective practices and if there are deterrents to that practice. The question about barrier method dissuasion through intimidation was included to provide insight into its prevalence among this age group and how it could impact their inclusion of barrier method communication on the guidelines of consent as compared to older populations. Out of the 175 participants who responded, 26% of them experienced pressure or threats from a sexual partner to not use a barrier method. Due to the often-partnered reality of sexual practices, there was a needed data point on how barrier method use was also impacted by the beliefs and preferences of sexual partners. The collection of trauma-informed responses from talking about barrier method use in addition to general insecurity and low confidence in talking about sexual preferences and desires were not intended to gather data solely based on relationship conflict but to find significance in that factor. Knowing more information about the influence participants had over their choice for sexual protection can

impact how health and educational efforts can impact undergraduates by more acutely addressing this concern for safer sex habits.

**Parallels in Health Behavior Research**

This study did not prove a cause-and-effect relationship between the COVID-19 pandemic and sexual behavior changes, but studies completed during and before when this study was conducted have shown some effects of COVID-19 on undergraduate students' behavior. Based on a study conducted from April to May 2020, there were initial conclusions made about behavior changes among international undergraduate students related to hygiene and social distancing as a response to the onset of COVID-19 (Wismans, et al., 2020, p. 6). Survey participants answered prompts on a response Likert scale from 1 (lowest agreement) to 5 (highest agreement) about certain behaviors they were currently presenting, and the results were described on an average (Wismans, et al., 2020, pp. 7-8). Participants experienced average agreement (score of 3) for not touching their faces, only leaving their homes when necessary, and not visiting others, but they reported above-average agreement (score of 4) for coughing/sneezing into their elbows/handkerchiefs, appropriately washing their hands, social distancing, only meeting with others when necessary, not shaking hands, and not visiting the elderly or medically vulnerable (Wismans, et al., 2020, pp. 7-8). These data demonstrated a rapid change in health behaviors as a result of the pandemic regardless of national affiliation and some demographics correlated to increased compliance with social distancing and hygiene precautions like females were more likely to heed both precautions while being in a romantic relationship increased hygiene likelihood but not social distancing (Wismans, et al., 2020, p. 15). Though data were collected from internationally-affiliated undergraduate students, findings can represent the possibility of short-term adjustments to the onset of the COVID-19 pandemic that impacted conscious health behaviors of the same population as the present study.

The value of this questionnaire was its specificity to the subject of barrier method use and simplified translations to pandemic safety habits among a population at high-risk for

contracting a sexually transmitted disease. If conclusions of this study are translated to other undergraduate communities because of the eligibility for any student to participate, the researcher admits a biased association with Appalachian State University and the large majority of participants that shared that association which localized much of the data to residents of Boone, North Carolina. The interest in barrier method use and sex practices of undergraduate students was based on the researcher's identity as an undergraduate student and concentration on sexual health education and advancement among low health-literate populations. The findings of this study were not indicative of any specific risks of knowledge or behavioral markers that correlated to opposing barrier method use or negative sexual behaviors but was an opportunity for conclusions to be made about socially and sexually protective practices after long exposure to a global pandemic and the mandated adjustment among a malleable age cohort.

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# Appendices

## Appendix A. Thesis Study Advertisement Flyer

"POST COVID-19 ANALYSIS OF BARRIER METHOD USE AND SEX PRACTICES AMONG UNDERGRADUATE STUDENTS"

**FAST FACT**

Those aged 15-24 made up 55.4% of the sexually transmitted infection cases in 2019 (CDC, 2021). This group has a higher probability to engage in risky sexual practices but they can protect themselves by getting tested for STIs and practicing safe sex.

**WHY DOES THIS MATTER?**

When the healthy and consensual, sex can be a positive part of life for yourself and your partners. Your sexual health can be impacted by method of STI protection/ contraception, STI status, and well-being of your sexual partners. Practicing safe sex is important and easily manageable when you have a clear understanding with your sexual partners.

**RESEARCH RESPONSE**

Due to the COVID-19 pandemic, there are possible discoveries related to the impact of safety guidelines related to physical distancing, face masks, and handwashing as they translate to barrier method use. Habits adopted in the past year could possibly create a shift in the use of barrier methods during sexual acts because of the frequent use of protection in public. A study on the impact of CDC guidelines on a population most commonly associated with sex is designed to analyze the impact of social protection equipment (face masks) as they can influence sexual protection equipment (condoms) use. The researcher is using a survey to collect unidentifiable data on the sexual practices of undergraduate students in the past year in addition to their COVID-19 habits and perceptions of barrier method communication.

**HOW CAN YOU GET INVOLVED?**

If you are over 18 and an undergraduate student regardless of university-affiliation, please complete the linked survey to contribute to the body of knowledge on:

- COVID-19 guideline practices
- sexual behaviors
- barrier method use
- partner communication

By engaging with this survey, you can inform evolving research findings about the pandemic-era practices of undergraduate-aged individuals.

**Click the link or scan the QR code to access the survey:**
bit.ly/barriermethodstudy

**Principal Investigator: Brianna Richardson**
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**Faculty Advisor: Dr. Terri Mitchell**
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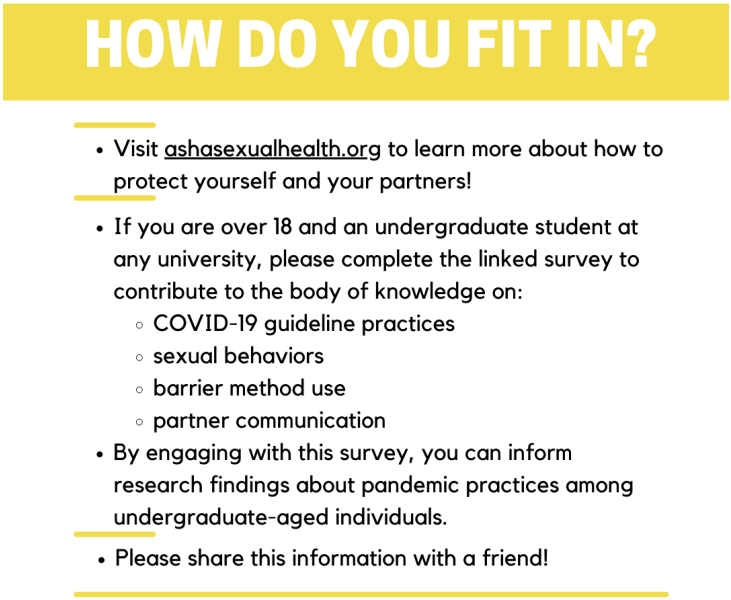
mitchlltd@appstate.edu

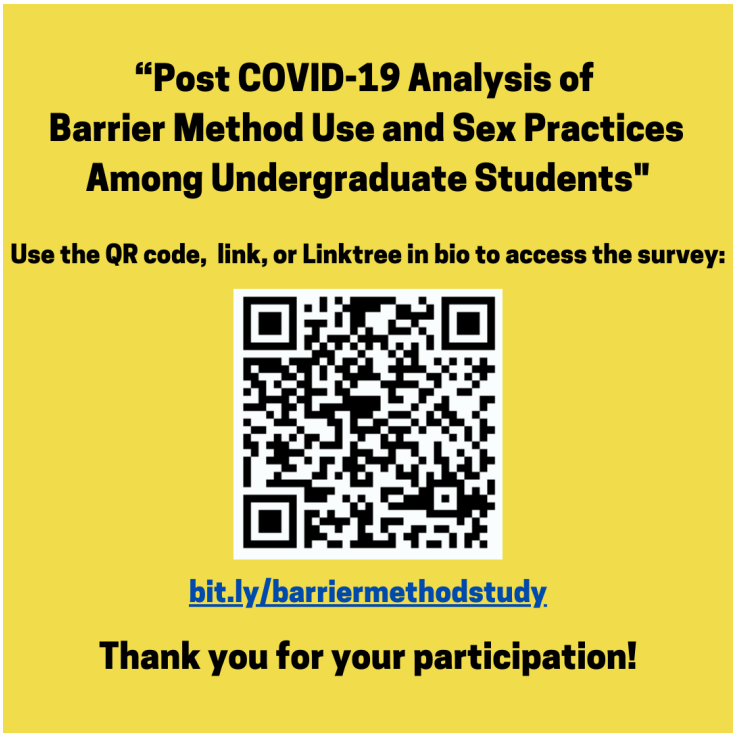
Text Sources: https://www.cdc.gov/std/statistics/2019/overview.htm#anchor_1606829809494 -
Image Sources: https://thenounproject.com/cecile0112358/uploads/?i=3701590 - https://thenounproject.com/cecile0112358/uploads/?i=3701555 - https://thenounproject.com/cecile0112358/uploads/?i=3701568

**Appendix B. Promotional Campaign Social Media Tiles (Listed in order of post)**

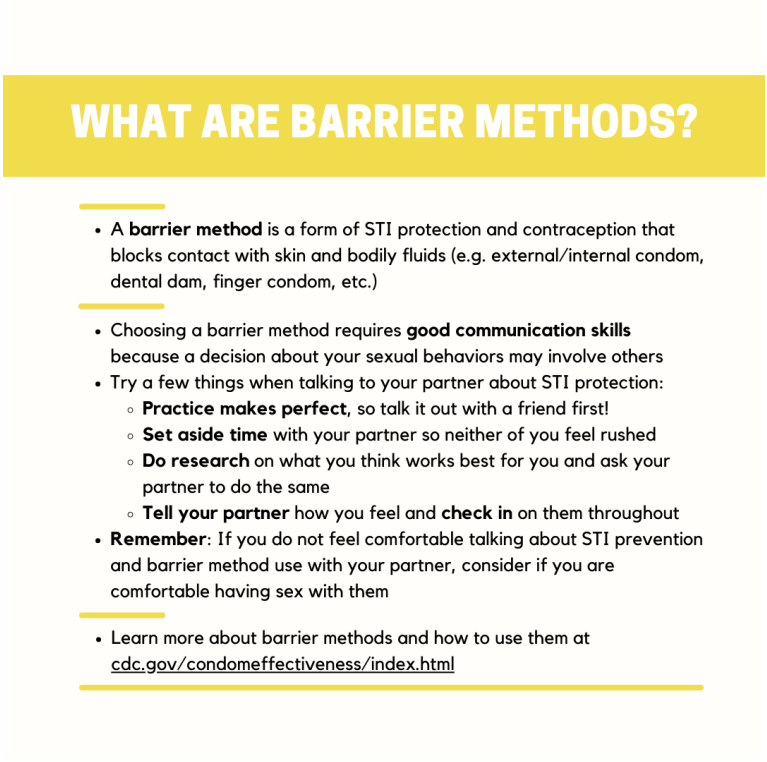
***"How Do You Fit In?" Tile (Included in all informational and encouragement tile posts)***



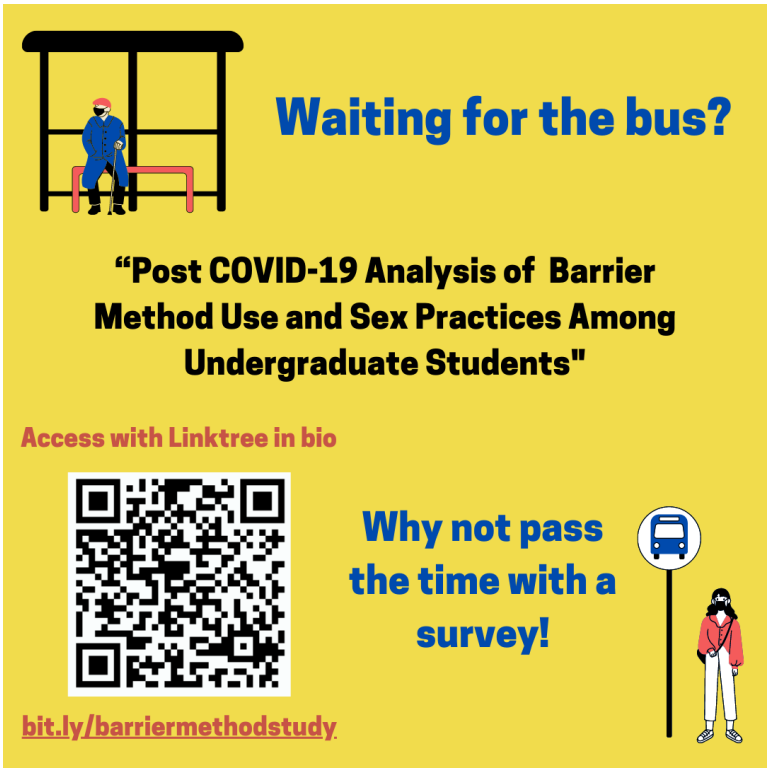

***"Survey Access" Tile (Included in all informational and encouragement tile posts)***



***"What are Barrier Methods?" Informational Tile (Monday, August 16th, 2021)***

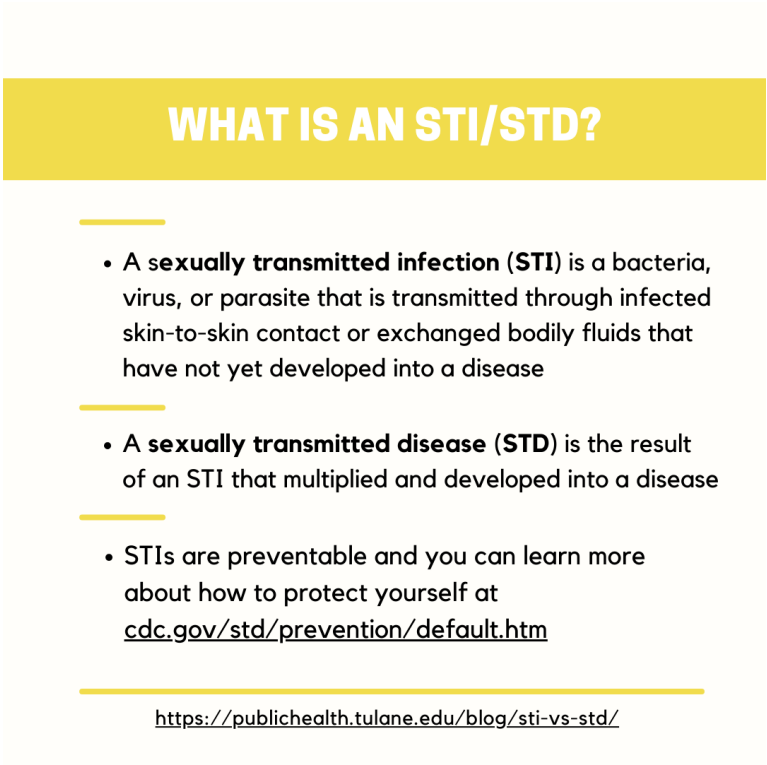



***Bus Encouragement Tile (Wednesday, August 18th, 2021)***



***"What is Contraception?" Informational Tile (Friday, August 20th, 2021)***


***"What is an STI/STD?" Informational Tile (Monday, August 23rd, 2021)***



***Bored Encouragement Tile (Wednesday, August 25th, 2021)***


***"Let's Get Tested!" Informational Tile (Friday, August 27th, 2021)***

***Qualifications Encouragement Tile (Monday, August 30th, 2021)***

**Are you...**

- ☐ over 18?
- ☐ an undergraduate student (any college)?
- ☐ sexually active?

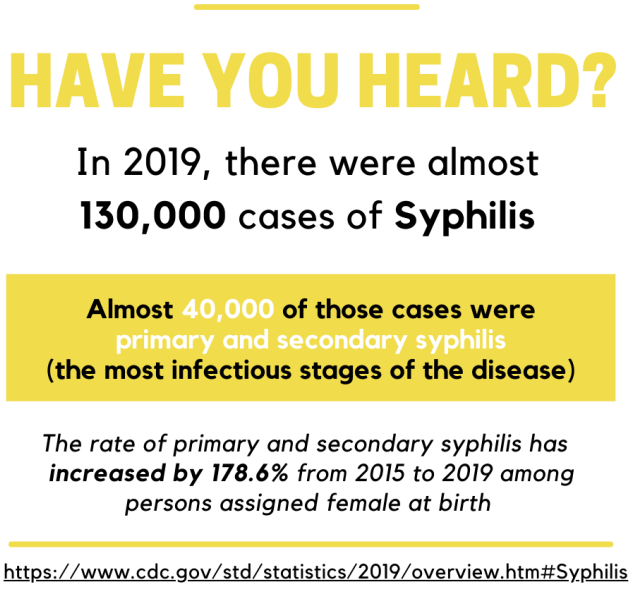
**Are you willing to anonymously share about your...**

- ☐ COVID-19 safety habits
- ☐ sexual behaviors
- ☐ barrier method use
- ☐ communication with partners

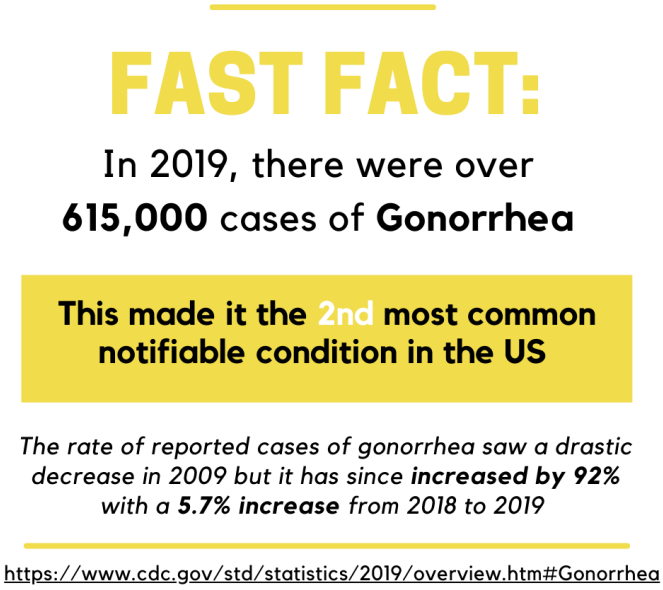
**If you answered "yes" to those questions...**

visit bit.ly/barriermethodstudy to take part in a survey on how our protective sexual practices have changed since the COVID-19 pandemic!

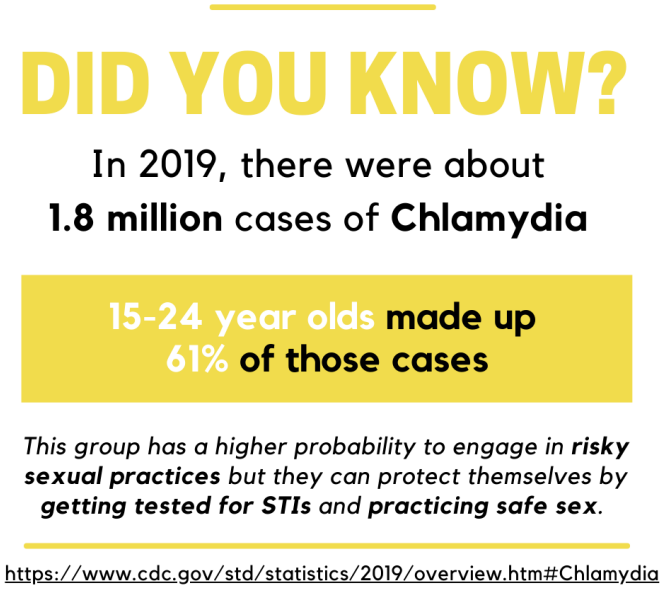
***"Have You Heard? (Syphilis)" Informational Tile (Monday, August 30th, 2021)***



***"Fast Fact (Gonorrhea)" Informational Tile (Monday, August 30th, 2021)***



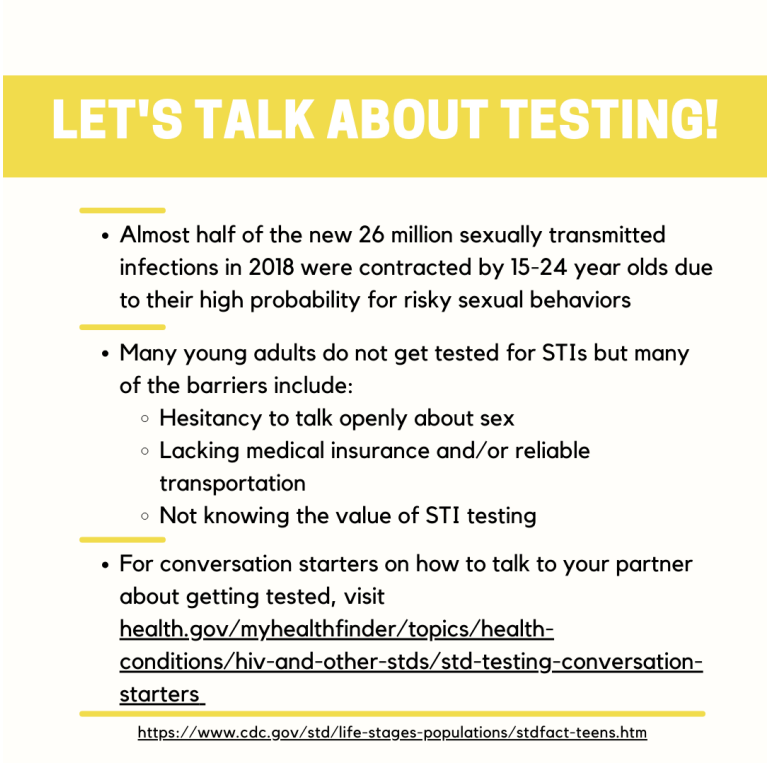

***"Did You Know? (Chlamydia)" Informational Tile (Monday, August 30th, 2021)***



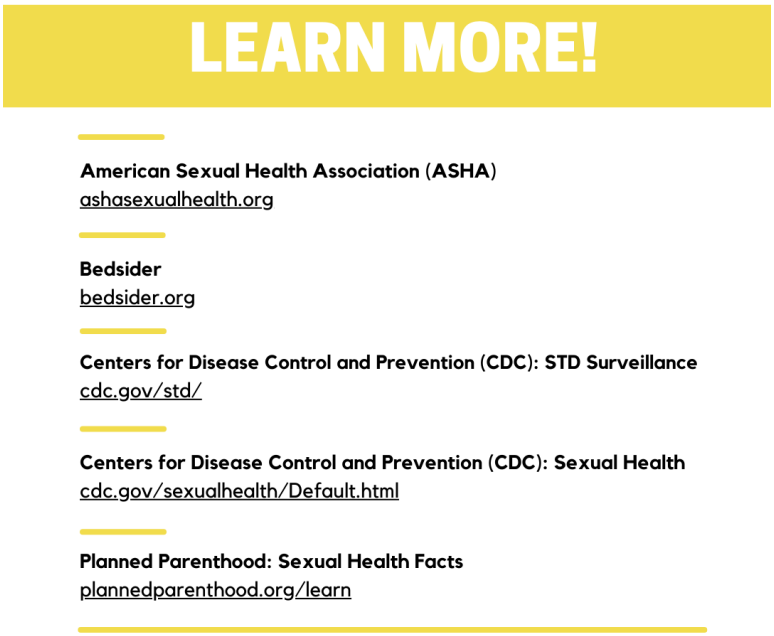
***Positive Push Access Tile (Monday, August 30th, 2021)***


***Partner Encouragement Tile (Wednesday, September 1st, 2021)***

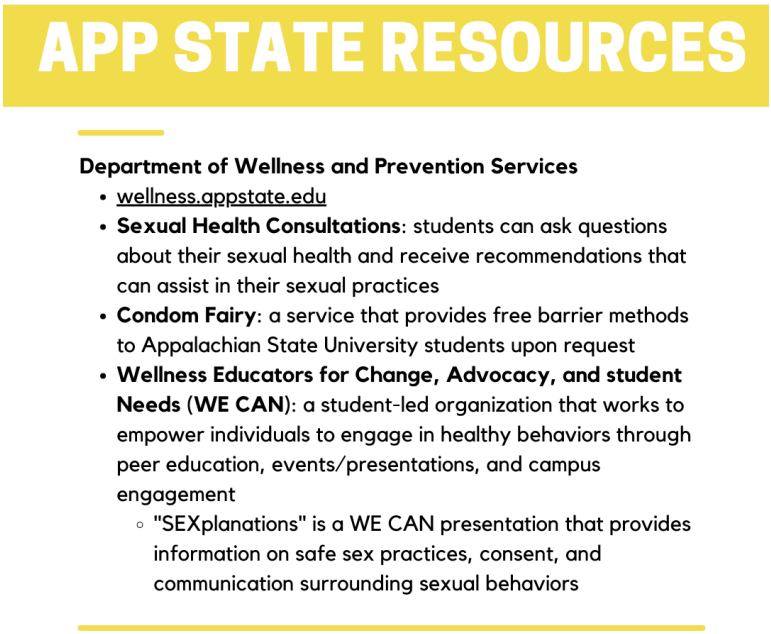
***"Let's Talk About Testing!" Informational Tile (Friday, September 3rd, 2021)***



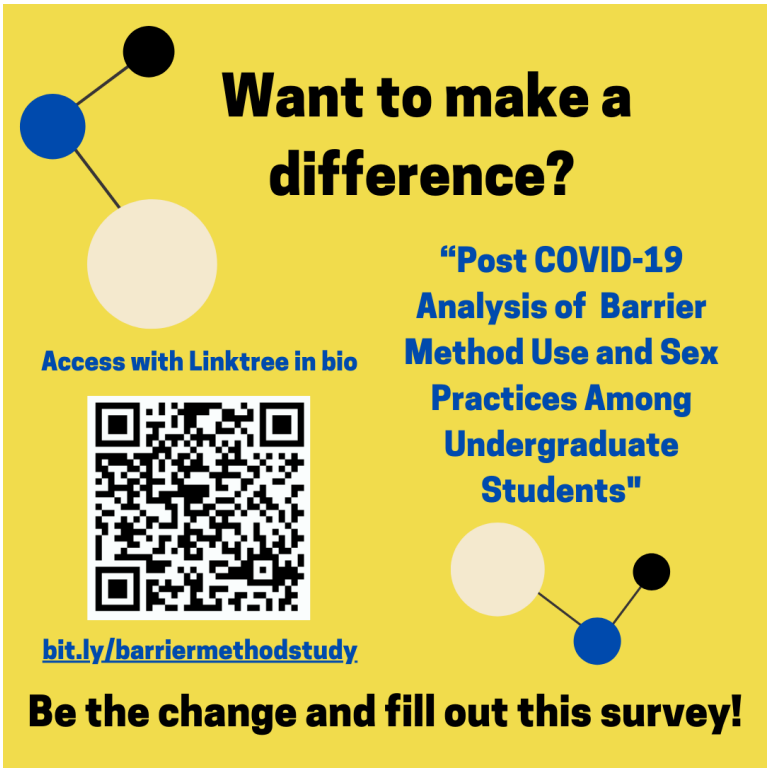

***"Learn More!" Informational Tile (Monday, September 6th, 2021)***



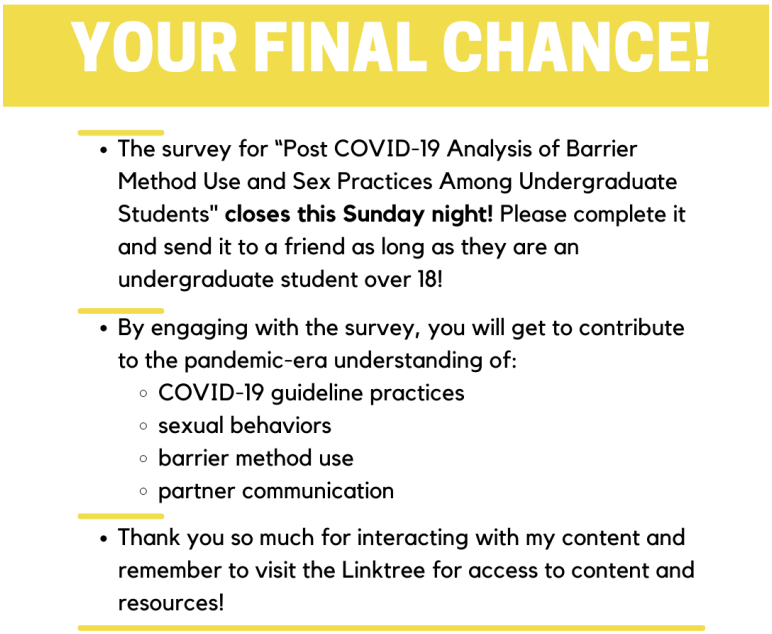
***"App State Resources" Informational Tile (Monday, September 6th, 2021)***




***Make A Difference Encouragement Tile (Wednesday, September 8th, 2021)***



***"Your Final Chance" Tile (Friday, September 10th, 2021)***



**Appendix C. Social Media Tile Information Sheet**

**Barrier Method Study Links**

*Thank you for taking interest in my thesis project about sexual health! Below are the links referenced in the social media tiles you viewed organized by tile title.*

*In addition to exploring the many resources below, please complete the survey for my study titled, "Post COVID-19 Analysis of Barrier Method Use and Sex Practices Among Undergraduate Students." The link to the survey is at the top of the list. Your responses are greatly appreciated and add to the growing body of knowledge of pandemic-era sexual health!*

*At the base of this document is the official study poster which you are welcome to save and share with others!*

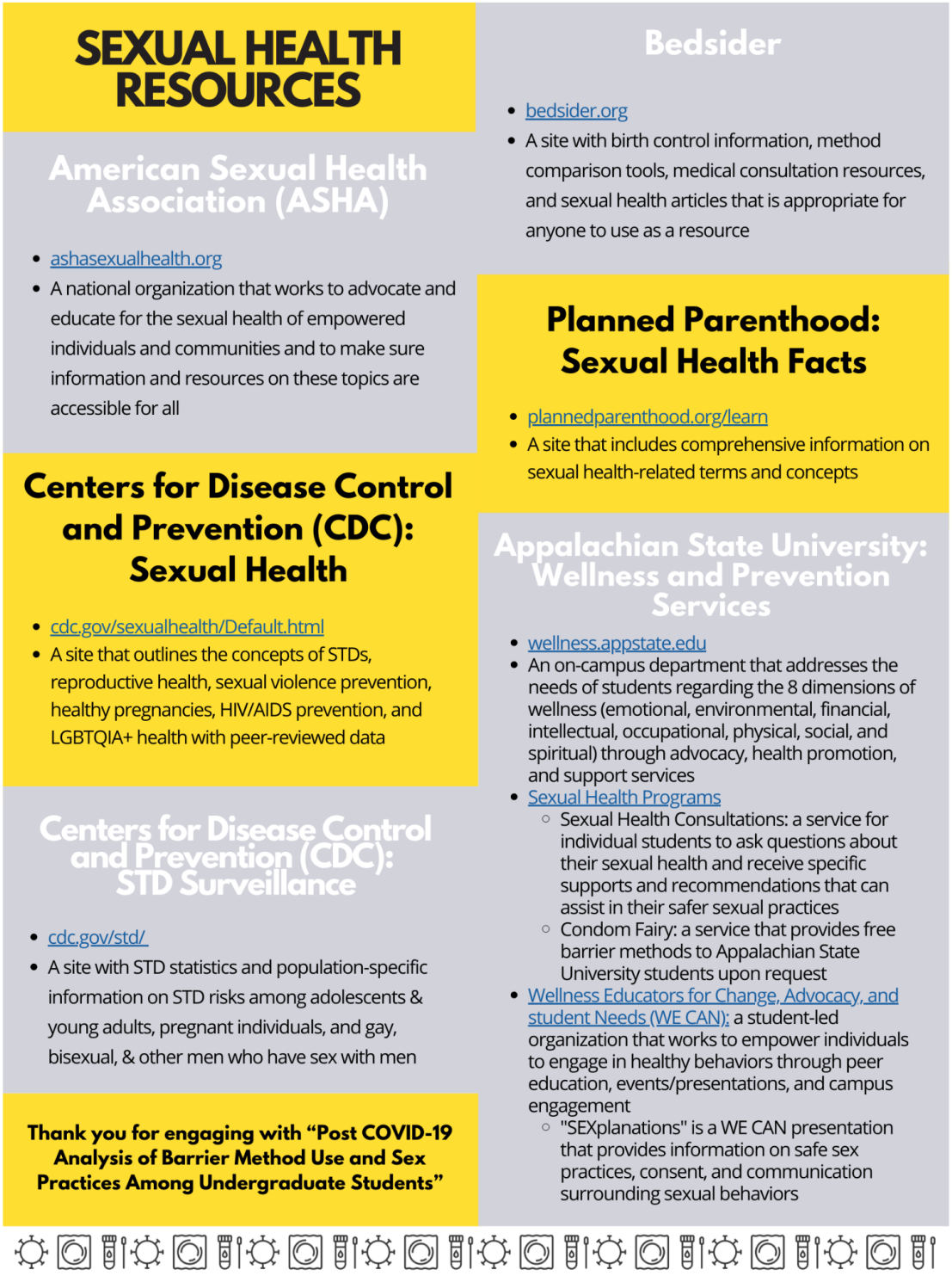
| Title of Tile | Resource Name | Link |
|---|---|---|
| Survey: "Post COVID-19 Analysis of Barrier Method Use and Sex Practices Among Undergraduate Students" | Survey for Barrier Method Study | bit.ly/barriermethodstudy |
| What Is An STI/STD? | CDC: How You Can Prevent Sexually Transmitted Diseases | https://www.cdc.gov/std/prevention/default.htm |
| What Is An STI/STD? | STI vs. STD: Key Differences and Resources for College Students | https://publichealth.tulane.edu/blog/sti-vs-std/ |
| Did You Know? (Chlamydia) | CDC: Sexually Transmitted Disease Surveillance, 2019 Chlamydia | https://www.cdc.gov/std/statistics/2019/overview.htm#Chlamydia |

| | | |
|---|---|---|
| Fast Fact (Gonorrhea) | CDC: Sexually Transmitted Disease Surveillance, 2019 Gonorrhea | https://www.cdc.gov/std/statistics/2019/overview.htm#Gonorrhea |
| Have You Heard? (Syphilis) | CDC: Sexually Transmitted Disease Surveillance, 2019 Syphilis | https://www.cdc.gov/std/statistics/2019/overview.htm#Syphilis |
| What are Barrier Methods? | CDC: How to Use Condoms and Other Barriers | https://www.cdc.gov/condomeffectiveness/index.html |
| What is Contraception? | Planned Parenthood: Birth Control | https://www.plannedparenthood.org/learn/birth-control |
| Let's Talk About Testing! | STD Testing: Conversation Starters | https://health.gov/myhealthfinder/topics/health-conditions/hiv-and-other-stds/std-testing-conversation-starters |
| Let's Talk About Testing! | CDC Fact Sheet: Information for Teens and Young Adults - Staying Healthy and Preventing STDs | https://www.cdc.gov/std/life-stages-populations/stdfact-teens.htm |
| Let's Get Tested! | CDC: Which STD Tests Should I Get? | https://www.cdc.gov/std/prevention/screeningreccs.htm |
| Let's Get Tested! | CDC: GetTested | https://gettested.cdc.gov |
| Let's Get Tested! | Appalachian State Student Health Service | https://healthservices.appstate.edu |

| | | |
|---|---|---|
| Let's Get Tested! | CDC: Sexually Transmitted Infections - Adolescents and Young Adults | https://www.cdc.gov/std/life-stages-populations/adolescents-youngadults.htm |
| Learn More! | American Sexual Health Association (ASHA) | https://www.ashasexualhealth.org/ |
| Learn More! | Bedsider | https://www.bedsider.org/ |
| Learn More! | Centers for Disease Control and Prevention (CDC): STD Surveillance | https://www.cdc.gov/std/ |
| Learn More! | Centers for Disease Control and Prevention (CDC): Sexual Health | https://www.cdc.gov/sexualhealth/Default.html |
| Learn More! | Planned Parenthood: Sexual Health Facts | https://www.plannedparenthood.org/learn |
| App State Resources | Appalachian State University: Department of Wellness and Prevention Services | https://wellness.appstate.edu/ |
| How Do You Fit In? | American Sexual Health Association (ASHA) | https://www.ashasexualhealth.org |

Research Contact Information
**Principal Investigator: Brianna Richardson**
Appalachian State University | Department of Health and Exercise Sciences
richardsonbe1@appstate.edu
**Faculty Advisor: Dr. Terri Mitchell**
Appalachian State University | Department of Recreation Management and Physical Education (RMPE)
mitchlltd@appstate.edu

**Appendix D. Social Media Sexual Health Resources**




**Appendix E. Qualtrics Questionnaire "Post COVID-19 Analysis of Barrier Method Use and Sex Practices Among Undergraduate Students"**

# Questionnaire "Post COVID-19 Analysis of Barrier Method Use and Sex Practices Among Undergraduate Students”

# Survey Flow

**Standard: Consent Form (1 Question)**
**Standard: Start Page (1 Question)**
**Standard: Demographics (8 Questions)**
**Standard: COVID-19 Safety Guidelines (8 Questions)**
**Block: Sexual Behavior (25 Questions)**
**Standard: Barrier Method Communication (6 Questions)**
**Standard: Last Page (3 Questions)**

Page Break

Start of Block: Consent Form

Q1.1 Information to Consider about this Honors Thesis Project

**"Post COVID-19 Analysis of Barrier Method Use and Sex Practices Among Undergraduate Students"**

Principal Investigator: Brianna Richardson - Department of Health and Exercise Sciences - richardsonbe1@appstate.edu
Faculty Advisor: Dr. Terri Mitchell - Department of Recreation Management and Physical Education (RMPE) - mitchlltd@appstate.edu

You are invited to participate in an honors thesis project that will assess the differences in sexual behavior before and during the COVID-19 pandemic. The following survey will ask about barrier method use during sexual activity, observing COVID-19 safety guidelines, and the impact of communication on sexual behaviors. The study will explore barrier method use and how it related to the COVID-19 safety guidelines in 2020.

If you agree to be part of the honors thesis project, you will be asked to anonymously answer questions about your COVID-19 habits, sexual behavior practices in the past 12 months, and experience communicating about barrier method use. The survey will take 15-20 minutes to complete.

Benefits of completing the survey may include learning more about barrier method use in the context of sexual behavior and receiving resources available both in-person and online.

Risks and discomforts may include sharing intimate information about your sexual behaviors and COVID-19 safety habits in the past 12 months. This information may be uncomfortable to share but all data will be collected without identifying information, stored securely, and analyzed as whole to maintain anonymity.

Participating in this survey is completely voluntary. Even if you decide to participate now, you may change your mind and stop at any time. You may choose not to answer a survey question for any reason.

If you have questions about this honors thesis project, you may contact Brianna Richardson and Dr. Terri Mitchell with the contact information above or displayed at the end of the survey.

By continuing to the survey procedures, I acknowledge that I am at least 18 years old, have read the above information, and agree to participate.

- ○ I agree (4)
- ○ I disagree (5)

*Skip To: End of Survey If Q1.1 = 5*

**End of Block: Consent Form**

**Start of Block: Start Page**

Q2.1 The purpose of this survey is to identify and assess the differences of barrier method use and sex practices among undergraduate students before and during the COVID-19 pandemic. Several questions require a response to make sure you are eligible for the study. Otherwise, you are able to skip any questions you do not want to answer and all answers provided are greatly appreciated. No personal information that can identify you will be collected and all responses to this survey will be analyzed as a whole. This survey should take 15-20 minutes to complete. Thank you for your participation.

**End of Block: Start Page**

**Start of Block: Demographics**

Q3.1 What is your age?

_____

*Skip To: End of Survey If Condition: What is your age? Is Less Than 18. Skip To: End of Survey.*

Q3.2 What is your current academic classification?

- First-year undergraduate student (1)
- Second-year undergraduate student (2)
- Third-year undergraduate student (6)
- Fourth-year undergraduate student (3)
- Fifth-year undergraduate student (4)
- Graduate student (5)
- Staff/Faculty (7)

*Skip To: End of Survey If Q3.2 = 5*

*Skip To: End of Survey If Q3.2 = 7*

Page Break

Q3.3 What is your biological sex (sex assigned at birth)?

- ○ Female (1)
- ○ Male (2)
- ○ Intersex (3)

Q3.4 What is your gender identity?

- ○ Cisgender Woman (1)
- ○ Cisgender Man (2)
- ○ Transgender Woman (3)
- ○ Transgender Man (4)
- ○ Non-Binary or Genderqueer (5)
- ○ Two-Spirit (6)
- ○ Other (Please specify) (7) _____
- ○ I prefer to not say (8)

Q3.5 What is your racial/ethnic background?

- White (1)
- Black or African American (4)
- Hispanic or Latinx (5)
- Asian (6)
- Native Hawaiian or Pacific Islander (7)
- Native American or Indigenous (8)
- Mixed Race or Biracial (9)
- Other (Please specify) (10) _____
- I prefer not to say (11)

Q3.6 What is your sexual identity?

- Heterosexual (1)
- Gay (2)
- Lesbian (3)
- Bisexual (4)
- Pansexual (5)
- Asexual (6)
- Queer (7)
- Unsure or Questioning (8)
- Other (Please specify) (9) _____
- I prefer not to say (10)

Q3.7 How would you describe your housing?

- On-Campus (1)
- Off-Campus, in personal housing (4)
- Off-Campus, in parent/guardian housing (5)

Q59 Are you an international student?

- Yes (1)
- No (2)

**End of Block: Demographics**

Start of Block: COVID-19 Safety Guidelines

Q4.1 **The following section will include information about the COVID-19 pandemic and ask questions about your habits since March 2020.** The intention of this section is not to collect personal information about your beliefs or medical history but to understand the relationship between COVID-19 habits and sexual behavior practices. No identifying information is collected to do so. This section is designed to assess the impact of COVID-19 safety guidelines on undergraduate sexual behaviors as compared to data before March 2020. **Please answer honestly and accurately.**

Page Break

Q4.2 **You may skip any questions in this survey but a response to the following question may affect the accuracy of the questions in this section.** Please provide a response to the following question as the COVID-19 safety guidance-related questions displayed will differ based on vaccine status.

*

Q4.3 What is your COVID-19 vaccine status?

- ○ Unvaccinated (1)
- ○ Partly vaccinated (Moderna/Pfizer-BioNTech first dose only) (4)
- ○ Fully vaccinated (Moderna/Pfizer-BioNTech first & second dose or Johnson & Johnson's Janssen single dose) (5)
- ○ I prefer not to say (6)

Page Break

Q4.4 Terms Related to COVID-19 Safety Guidelines

**“Fully vaccinated”** is a term used here to describe an individual at least 2 weeks after their final COVID-19 vaccine

**“Face mask”** is a term used to describe a mask that has at least 2 layers of fabric, fits on either side of the face without gaps, and covers the nose, mouth, and chin

**“Physically-distanced”** is a term used here to describe an individual who maintains 6 feet between themselves and those who are not in their household which is also known as "social distancing"

**“Handwashing”** is a term used here to describe the use of soap and water to disinfect the surfaces of the hands *(Note: Though not recognized in this survey, hand sanitizer with at least 60% alcohol is accepted by the CDC as a substitute when soap and water are not available)*

Q4.5 Face Mask Use: Please indicate which settings you wore a mask when **unvaccinated**.

- [ ] Crowded, well-ventilated indoor setting (1)
- [ ] Crowded, poorly-ventilated indoor setting (4)
- [ ] Crowded outdoor setting (5)
- [ ] Physically-distanced, well-ventilated indoor setting (6)
- [ ] Physically-distanced, poorly-ventilated indoor setting (7)
- [ ] Physically-distanced outdoor setting (8)
- [ ] At home only with those in your household (9)
- [ ] At home with those not in your household (10)

*Display This Question:*

*If Q4.3 = 5*

Q4.6 Face Mask Use: Please indicate which settings you wore a mask when **fully vaccinated**.

- [ ] Crowded, well-ventilated indoor setting (1)
- [ ] Crowded, poorly-ventilated indoor setting (4)
- [ ] Crowded outdoor setting (5)
- [ ] Physically-distanced, well-ventilated indoor setting (6)
- [ ] Physically-distanced, poorly-ventilated indoor setting (7)
- [ ] Physically-distanced outdoor setting (8)
- [ ] At home only with those in your household (9)
- [ ] At home with those not in your household (10)

Q4.7 Handwashing: Please indicate which situations you washed your hands for at least 20 seconds when **unvaccinated**.

- ☐ Before eating with cutlery/eating utensils (1)
- ☐ Before eating without cutlery/eating utensils (11)
- ☐ After touching a car door, exterior door handle, or interior door handle (7)
- ☐ After interacting with those in your household (roommates, family members, etc.) (8)
- ☐ After interacting with friends or family who are not in your household (9)
- ☐ After interacting with strangers who are not in your household (10)

*Display This Question:*

*If Q4.3 = 5*

Q4.8 Handwashing: Please indicate which situations you washed your hands for at least 20 seconds when **fully vaccinated**.

- ☐ Before eating with cutlery/eating utensils (1)
- ☐ Before eating without cutlery/eating utensils (11)
- ☐ After touching a car door, exterior door handle, or interior door handle (7)
- ☐ After interacting with those in your household (roommates, family members, etc.) (8)
- ☐ After interacting with friends or family who are not in your household (9)
- ☐ After interacting with strangers who are not in your household (10)

End of Block: COVID-19 Safety Guidelines

Start of Block: Sexual Behavior

Q5.1 **The following section will ask questions about your relationships, sexual interactions, and barrier method practices in the past 12 months, but no identifying information will be collected to do so.** The focus of this study is barrier method use so the included sexual practices are limited to those at risk for communicable disease exchanges but forms of consensual sex not included in this study are not meant to be diminished or ignored. **Please answer honestly and accurately.**

Page Break

Q5.2 In the past 12 months, how would you describe your sexual relationships? Select all that apply.

- [ ] Monogamous (committed relationship with 1 sexual partner) (4)
- [ ] Polyamorous (committed relationship more than 1 sexual partner) (7)
- [ ] Single and at least 1 non-committed sexual partner (8)
- [ ] Single and no sexual partners / Asexual romantic relationship (9)

Page Break

Q5.4 **"Sex toy"** is a term used here to describe a dildo *(a tool that is often shaped like a penis and is inserted into the vagina or anus)* or vibrator *(a vibrating tool that stimulates the genitals by being inserted into the vagina/anus or being used outside the body on the clitoris/penis)*

Q5.5 In the past 12 months, what forms of sexual activity have you engaged in?

- [ ] No sexual interactions (1)
- [ ] Oral (mouth to genitals contact) (4)
- [ ] Vaginal (penis/sex toy to vagina contact) (5)
- [ ] Anal (penis/sex toy to anus contact) (6)
- [ ] Finger/Hand Contact (finger/hand to genitals/anus contact - also known as "fingering" or "hand job") (7)
- [ ] Mutual Masturbation (stimulation of one's own genitals) (*Note: Indicate only if stimulation is generated from **sex toy shared between sexual partners**)* (8)
- [ ] Genital Humping/Rubbing (genital to genital contact) (9)

*Skip To: End of Block If Q5.5 = 1*

Page Break

Q5.6 “**Sexually Transmitted Infection (STI)**” is a term used here to describe a bacteria, virus, or protozoa transmitted through sexual contact from someone who is already infected “**Sexually Transmitted Disease (STD)**” is a term used here to describe the resulting disease of an STI

Q5.7 **“Barrier method”** is a term used here to describe a form of STI protection or contraception that blocks fertilization and contact with sexual fluids but does not require professional administration or hormones for use

Q5.8 In the past 12 months, have you used any type of barrier method when engaging in any form of sexual activity?

- ○ Yes (1)
- ○ No (2)
- ○ I do not know (3)

Page Break

Q5.9 *An* **External (Male) Condom** *is a sheath that covers the penis to contain ejaculate and limit the spread of STIs* from the penis shaft and tip only

In the past 12 months, have you used an **External (Male) Condom** when engaging in any form of sexual activity?

- Yes (1)
- No (2)
- I do not know (4)

Q5.10 *An* ***Internal (Female) Condom*** *is a large sheath with an inner ring that is inserted into the anus or vagina to rest against the cervix while the outer ring stays at the opening of the anus or vagina (vulva) to collect ejaculate*

In the past 12 months, have you used an **Internal (Female) Condom** when engaging in any form of sexual activity?

- Yes (2)
- No (3)
- I do not know (4)

Q5.11 *A* ***Dental Dam*** *is a barrier between the mouth and vagina or anus during oral sex in the form of a latex or polyurethane sheet*

In the past 12 months, have you used a **Dental Dam** when engaging in any form of sexual activity?

- Yes (2)
- No (3)
- I do not know (4)

Q5.12 *A **Finger Cot/Finger Condom** is a glove-like sheath that covers the finger to avoid contact with sexual fluids*

In the past 12 months, have you used a **Finger Cot/Finger Condom** when engaging in any form of sexual activity?

- ○ Yes (1)
- ○ No (2)
- ○ I do not know (3)

Q5.13 ***Spermicide** is a foam, cream, gel, film, suppository, or tablet that is inserted into vagina and prevents fertilization by killing sperm*

In the past 12 months, have you used a **Spermicide** when engaging in any form of sexual activity?

- ○ Yes (1)
- ○ No (2)
- ○ I do not know (3)

Q5.14 *A **Diaphragm** is a shallow cup that covers the cervix to block and kill sperm and can be used with spermicide.*

In the past 12 months, have you used a **Diaphragm** when engaging in any form of sexual activity?

- ○ Yes (1)
- ○ No (2)
- ○ I do not know (3)

Q5.15 *A **Sponge** is a soft foam disk that contains spermicide and covers the cervix to block and kill sperm*

In the past 12 months, have you used a **Sponge** when engaging in any form of sexual activity?

- ○ Yes (1)
- ○ No (2)
- ○ I do not know (3)

Q5.16 Please indicate how often you used each barrier method when you were sexually active in the past 12 months.

| | Always (20) | Most of the time (21) | About half the time (22) | Sometimes (23) | Never (24) |
|---|---|---|---|---|---|
| External (Male) Condom (4) | ○ | ○ | ○ | ○ | ○ |
| Internal (Female) Condom (5) | ○ | ○ | ○ | ○ | ○ |
| Dental Dam (6) | ○ | ○ | ○ | ○ | ○ |
| Finger Cot/Finger Condom (7) | ○ | ○ | ○ | ○ | ○ |
| Spermicide Alone (8) | ○ | ○ | ○ | ○ | ○ |
| Diaphragm with Spermicide (9) | ○ | ○ | ○ | ○ | ○ |
| Sponge with Spermicide (10) | ○ | ○ | ○ | ○ | ○ |

Page Break

Q5.17 In the last 12 months, which barrier methods did you use when engaging in **Oral (mouth to genitals contact)** sexual activity?

- [ ] External (Male) Condom (1)
- [ ] Internal (Female) Condom (4)
- [ ] Dental Dam (5)
- [ ] No barrier methods used (6)

Q5.18 In the last 12 months, which barrier methods did you use when engaging in **Vaginal (penis/sex toy to vagina contact)** sexual activity?

- [ ] External (Male) Condom (1)
- [ ] Internal (Female) Condom (4)
- [ ] Dental Dam (5)
- [ ] Finger Cot/Finger Condom (6)
- [ ] Spermicide Alone (7)
- [ ] Diaphragm with Spermicide (8)
- [ ] Sponge with Spermicide (9)
- [ ] No barrier methods used (10)

Q5.19 In the last 12 months, which barrier methods did you use when engaging in **Anal (penis/sex toy to anus contact)** sexual activity?

- [ ] External (Male) Condom (1)
- [ ] Internal (Female) Condom (4)
- [ ] Dental Dam (5)
- [ ] Finger Cot/Finger Condom (6)
- [ ] No barrier methods used (7)

Q5.20 In the last 12 months, which barrier methods did you use when engaging in **Finger/Hand Contact (finger/hand to genitals/anus contact - also known as "fingering" or "hand job")**?

- [ ] External (Male) Condom (1)
- [ ] Internal (Female) Condom (4)
- [ ] Dental Dam (5)
- [ ] Finger Cot/Finger Condom (6)
- [ ] No barrier methods used (7)

Q5.21 In the last 12 months, which barrier methods did you use when engaging in **Mutual Masturbation (stimulation of one's own genitals)** *(Note: Indicate only if stimulation is generated from sex toy shared between sexual partners)*?

- [ ] External (Male) Condom (1)
- [ ] Internal (Female) Condom (4)
- [ ] Dental Dam (5)
- [ ] Finger Cot/Finger Condom (6)
- [ ] No barrier methods used (7)

Q5.22 In the last 12 months, which barrier methods did you use when engaging in **Genital Humping/Rubbing (genital to genital contact)**?

- [ ] External (Male) Condom (1)
- [ ] Internal (Female) Condom (4)
- [ ] Dental Dam (5)
- [ ] Finger Cot/Finger Condom (6)
- [ ] No barrier methods used (7)

Page Break

Q5.23 When have you used a barrier method in the past 12 months, has the method been used for only a portion of the sexual interaction? Select all that apply.

- [ ] Yes, barrier method was taken off before ejaculation (1)
- [ ] Yes, barrier method was put on after sexual activity had already begun (4)
- [ ] Yes, barrier method broke or malfunctioned and was removed (5)
- [ ] Yes, other (Please specify) (6) _____
- [ ] No (7)
- [ ] I do not know (8)

Page Break

Q5.24 In the past 12 months, how have you obtained a barrier method? Select all that apply.

- [ ] Bought in-store (1)
- [ ] Bought online (4)
- [ ] Used doctor’s prescription to buy at a pharmacy (5)
- [ ] Received it for free at a health clinic or public health entity (6)
- [ ] Used Wellness and Prevention Services' “Condom Fairy” service at Appalachian State University (7)
- [ ] Other (Please specify) (8) _____

Page Break

Q5.30 When you have used barrier methods during a sexual interaction, what have been the **most important reasons why**? Please use the rank order feature to indicate the most (1) to least (7) important reasons why you have used a barrier method.

_____ To prevent pregnancy (1)
_____ To prevent a sexually transmitted infection (STI) (4)
_____ A recent positive STD test for yourself and/or your sexual partner (5)
_____ Pressure from your sexual partner to use a barrier method (11)
_____ To have a sexual interaction with a non-monogamous sexual partner (7)
_____ To use as an alternative to a long-acting, hormonal, or permanent contraceptive (8)
_____ Other (Please specify) (9)

Q5.31 When you have not used barrier methods during a sexual interaction, what have been the **most important reasons why not**? Please use the rank order feature to indicate the most (1) to least (7) important reasons why you have not used a barrier method.

_____ The preferred barrier method was not available (1)
_____ To engage in an unexpected/unanticipated sexual interaction (4)
_____ You and your sexual partner are not worried about pregnancy and/or STIs (5)
_____ A recent negative STI test for yourself and/or your sexual partner (6)
_____ Pressure from your sexual partner to not use a barrier method (7)
_____ To have a sexual interaction with a monogamous sexual partner (8)
_____ To use a long-acting, hormonal, or permanent contraceptive instead (9)
_____ Other (Please specify) (10)

**End of Block: Sexual Behavior**

**Start of Block: Barrier Method Communication**

Q6.1 Have you ever had a conversation with a sexual partner about barrier method use? *(ex. talking about personal preferences, requesting to use a certain method, etc.)*

- ○ Yes (1)
- ○ No (2)

Page Break

Q6.2 Do you feel comfortable talking to a **monogamous** sexual partner about barrier method use?

- ○ Yes (1)
- ○ No (2)

Q6.3 Do you feel comfortable talking to a **non-monogamous** sexual partner about barrier method use?

- ○ Yes (1)
- ○ No (2)

Page Break

Q6.4 Have you ever been pressured or threatened by a sexual partner to **not** use a barrier method?

- ○ Yes (1)
- ○ No (2)
- ○ I do not know (3)

Page Break

Q6.5 ***Consent*** *is the clear, enthusiastic, and informed exchange between individuals as they talk about specific forms of sexual activity with the knowledge that all agreements are reversible without threat of manipulation.*

Do you consider talking about barrier method use with a sexual partner a form of **consent**?

- ○ Yes (4)
- ○ No (7)
- ○ I do not know (8)

Page Break

Q6.6 After completing this survey, how comfortable do you feel talking about barrier method use with a sexual partner?

- ○ More comfortable than before starting this survey (1)
- ○ Same level of comfort as before starting this survey (4)
- ○ Less comfortable than before starting this survey (5)
- ○ I do not know (6)

**End of Block: Barrier Method Communication**

**Start of Block: Last Page**

Q7.1 Which source did you use to access this survey?

- ○ I received an email and used the link (1)
- ○ I used a link from social media (Instagram/Facebook/LinkedIn) (5)
- ○ I used a link shared by an organization or professor (7)
- ○ Other (Please specify) (3) _____

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Q7.2 Resources

The following are resources with information on healthy sexual behaviors, current sexual health statistics, and sexual health services:

**American Sexual Health Association (ASHA)**

A national organization that works to advocate and educate for empowered sexual health of individuals and communities to make sure information and resources on these topics are accessible for all

ashasexualhealth.org

**Appalachian State University: Department of Wellness and Prevention Services**

An on-campus department that addresses the needs of students regarding the 8 dimensions of wellness (emotional, environmental, financial, intellectual, occupational, physical, social, and spiritual) through advocacy, health promotion, and support services

wellness.appstate.edu

Sexual Health Programs

Sexual Health Consultations: a service for individual students to ask questions about their sexual health and receive specific supports and recommendations that can assist in their safer sexual practices

Condom Fairy: a service that provides free barrier methods to Appalachian State University students upon request

Wellness Educators for Change, Advocacy, and student Needs (WE CAN): a student-led organization that works to empower individuals to engage in healthy behaviors through peer education, events/presentations, and campus engagement

"SEXplanations" is a WE CAN presentation that provides information on safe sex practices, consent, and communication surrounding sexual behaviors

**Bedsider**

A site with birth control information, method comparison tools, medical consultation resources, and sexual health articles that though catered to individuals assigned female at birth, is content that is appropriate for anyone

bedsider.org

**Centers for Disease Control and Prevention (CDC): Sexual Health**

A site that outlines the concepts of STDs, reproductive health, sexual violence prevention, healthy pregnancy, HIV/AIDS prevention, and LGBT health with updated and peer-reviewed data

cdc.gov/sexualhealth/Default.html

**Centers for Disease Control and Prevention (CDC): STD Surveillance**

A site with STD statistics and population specific information on STD risks among adolescents & young adults, pregnant individuals, and gay, bisexual, & other men who have sex with men

cdc.gov/std/

**Planned Parenthood: Sexual Health Facts**

A site that includes comprehensive information of sexual health-related terms and concepts

plannedparenthood.org/learn

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Q7.3 *“Post COVID-19 Analysis of Barrier Method Use and Sex Practices Among Undergraduate Students”*

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