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Intentions to Receive the COVID-19 Vaccine Among University Students

Ryan Shelton

Health Research Methods

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Abstract

Coronavirus, also known as COVID-19, is an infectious respiratory disease that has caused a global pandemic beginning in March of 2020 (CDC, 2020). Without a known cure for this new illness, major events have been canceled or rescheduled to avoid mass exposure. This includes college universities moving their classes to an online format, drastically impacting the students' learning experience. Without a vaccine or control of the virus, there is no foreseeable future with in-person classes or college events. With COVID-19 having such a large impact on college campuses in 2020, this study explored variables that impact college students' intentions to receive the COVID-19 vaccine as multiple on-going clinical trials exist to develop a vaccination. This study examined the variables of political party affiliation, interest in universal healthcare, receiving the flu shot last year, perceived susceptibility, and tobacco use. Data collection occurred by an online survey sent to all students in a James Madison University (JMU) Health Research Methods class. Analysis of survey results indicated a relationship existed between COVID-19 vaccine intentions and the variables of political party affiliation and receiving the flu shot last year. From this analysis, it was concluded that those who are registered as Democratic or liberal and those who received a flu shot are more likely to receive the COVID-19 vaccine. Results from this study are vital for public health officials to target the college population in order to achieve herd immunity for COVID-19 once a vaccine becomes available.

Background
The novel Coronavirus, or COVID-19, has forced major changes to the typical college experience for many university students. College students have faced drastic alterations from a once social and interactive college lifestyle, to a much more isolated and online approach. As students returned to campus in the fall, many universities experienced significant outbreaks of COVID-19 as student populations failed to follow health guidance on limiting social gatherings and mask wearing. This outbreak is related to existing literature on the college population that indicates how college students view themselves as an overall low risk for serious complications from diseases, making them less likely to engage in protective health behaviors (Subbarao & Akhilesh, 2017; Ramsey & Marczinski, 2011). Little is known about the emerging perception of college students’ risk assessment for COVID-19, and how college students view their need to become vaccinated. When analyzing seasonal influenza vaccination rates as an assessment of preventative health behaviors, the National Foundation of Infectious Disease reported in 2017 that less than half of U.S. college students receive the flu vaccine annually. College populations will need to achieve herd immunity in order to safely return to in person classes and hold large social gatherings without the risk of further spread. Understanding how college students assess their need to be vaccinated against COVID-19 would allow for health officials to accurately target the college population in the future. In order to analyze the attitudes of college students’ regarding the COVID-19 vaccine, this study explored factors of susceptibility to the disease, political party affiliation, smoking behavior, interest in a universal healthcare system, and receiving the flu vaccine last year.

According to the World Health Organization, universal healthcare is defined as granting access to health care services for all people regardless of financial status (WHO, 2020). There are currently 33 countries that offer universal healthcare, including Canada, Italy, Russia, the
United Kingdom, France, and Germany, but the United States is not one of them (Amadeo, 2020). Universal health care would be of interest to many different groups of people. For example, individuals with chronic diseases live with weakened immune systems that leave them immunocompromised. A COVID-19 vaccine would be beneficial to those with weakened immune systems that are too weak to fight off a COVID-19 infection, and are at risk for serious complications (CDC, 2020). Another group of individuals who may be interested in universal health care are those who are more knowledgeable about health care and want to promote population health. These individuals may be more inclined to receive a vaccine to generate herd immunity, and for medications and vaccines to become more affordable for everyone. It can be hypothesized that those who have an interest in universal healthcare will also have interest in receiving the COVID-19 vaccine when available.

Political party affiliation can at times divide a nation, as shown by the 2020 presidential election. The differing values of political parties tend to conflict with each other, specifically with the current COVID-19 pandemic. The media portrays a split between the views of Republicans and Democrats on whether wearing a mask is necessary or not, which also leads to the assumption that there could be differing views on receiving a COVID-19 vaccine. Existing literature found that between Democrats/Liberals and Republicans/Conservatives, the Conservatives had higher rates of mortality across the years, though Republicans self-reported overall better health and happiness than Democrats (Pabayo et al., 2015). Another study researched vaccination rates in elementary school children versus the political party affiliation of their parents (Buckman et al., 2020). Findings from this study showed that as the number of registered Democratic parents increased over the years of 2009-2017, the number of vaccination exemptions of students decreased (Buckman et al., 2020). A final study has found Republicans,
or Conservatives, were less likely to vaccinate for the flu (Kannan & Veazie, 2018). Generally, it is the Republicans who are refusing to wear masks and Democrats who are following the mandatory mask regulations. This observation leads to the question of whether political party affiliation would influence ideals on whether to get a COVID-19 vaccine, when made available.

Studies show that vaccine intentions among college students are very likely if they have received a flu shot within the past year (Ratnapradipa et al., 2017). This statistic can be misleading because less than half of college students received a flu vaccine as reported by a national survey (National Foundation for Infectious Diseases, 2017). By using this data, it can be interpreted that more than half of college students may not intend to receive the COVID-19 vaccine if they have not received their annual flu vaccine. The college population generally takes more risks than other demographics which can be a factor in them not receiving a flu shot or a COVID-19 vaccination unless they are mandatory in order to report to campus.

An individual’s perception of susceptibility to an illness has the ability to influence protective health behaviors. Historically, the younger age and good overall health of the college population has led to a decreased perception of susceptibility when college students assess their risk towards serious complications from influenza. Existing literature shows that a majority of college students report a low perceived susceptibility for contracting influenza (Ramsey & Marczinski, 2011; Ratnapradipa et al., 2017). Applying the constructs of the Health Belief Model (HBM) to the college population indicates no significant relationship exists between perceived susceptibility and intention to receive the vaccine in a sample of college freshmen (Ratnapradipa et al., 2017). Less is known about how college students assess their risk to COVID-19, but existing literature on influenza vaccine intentions of college students during the 2009 H1N1 pandemic can lead to a hypothesis that students will continue to express more than half of
participants having no intention to be vaccinated due to perception of reduced risk for becoming
seriously ill. (Ramsey & Marczinski, 2011). Existing literature does establish that a relationship
exists between the smaller population of students who report themselves to be at high risk for
influenza due to a medical condition and being significantly more likely to report intention to be
vaccinated (Ramsey & Marczinski, 2011).

Tobacco use in the college population has the potential for otherwise young and healthy
college students to experience life-threatening cases after contracting COVID-19, thus it is also
important to understand the perceived risk in college smokers. A recent study of US adults
indicated that over three-fourths of participants who were smokers assessed their risk of serious
complications from COVID-19 to be high in comparison to non-smokers (Kowitt et al., 2020). It
is unknown if the college population of smokers would similarly express a higher perceived risk
from COVID-19.

COVID-19 is such an apparent issue in society right now, but also a very new and
unexplored area, so the purpose of this study is to shine a light on whether the introduction of a
vaccine would have a significant impact on college society. By understanding the factors that
influence the college population to become vaccinated, leading health officials can better target
this population to achieve herd immunity to COVID-19 when the vaccine becomes available.
This study seeks to understand how opinion on universal healthcare, political party affiliation,
previous flu vaccination status, perception of susceptibility, and smoking behaviors influence a
college students’ intention to engage in the health protective behavior of receiving the
COVID-19 vaccine through answering these research questions:

**Research Question 1:** What is the relationship between a JMU student’s interest in universal
healthcare and their intention to receive the COVID-19 vaccine when it becomes available?
Research Question 2: What is the relationship between a JMU student’s political party affiliation and their intention to receive the COVID-19 vaccine when it becomes available?

Research Question 3: How does a JMU student’s behavior of receiving a flu shot in the past year relate to their intention of receiving a COVID-19 vaccine when available?

Research Question 4: How does a JMU student’s perception of individual susceptibility to COVID-19 relate to their intention to receive the COVID-19 vaccine when it becomes available?

Research Question 5: How does a JMU student's smoking behavior influence their perception of susceptibility to COVID-19?

Methodology

Participants

There were 256 participants that took the survey at the beginning of the fall 2020 semester. Each participant was a college student from James Madison University. The demographics that are being noted of this population of students includes the political party affiliation, age, gender, and class standing. The majority of the students’ political party affiliation is Democrat/lean liberal or progressive with 100% of the participants responding to this survey question (Table 2). The Republican/lean conservative and independent/other categories tied for the least amount of students with these political affiliations. All but one participant answered the age demographic question for a 99.6% response rate for this category (Table 1). The total response rate for gender and class standing was also 100% (Table 1).

Procedures

An online survey was distributed to gather health-related data on a population of JMU students via Canvas. The participants recruited for this survey were Health Science major
students who were asked by their professors to complete the survey. In order to promote students to complete the survey, professors made it a required assignment worth five points of the total grade. The sampling method used was non-probability convenience sampling, because students were already identified as being in one of the Health 408 sections, and not randomly chosen.

Participants were asked to answer a series of questions on individual attitudes and behaviors. This survey was available for students to take for approximately one week. The survey itself took anywhere between 5-15 minutes for students to complete. No names were tied to answers given on the survey in order for students to feel confident in giving honest answers about some controversial questions. It was stated in the beginning of the online survey that all answers would remain completely anonymous.

**Measures**

Data collection for this study occurred by administering an untested questionnaire survey using the online resource QuestionPro. The overall survey questions encompassed the topics of college student demographics, health related measures, patterns of adaptive learnings (PALs), and health scales including the multi-factor attitude toward condoms scale and COVID-19 HBM scales. As the research question of the study sought to identify the influence of key factors on COVID-19 vaccine intentions in the college population, the independent variables of political party affiliation, interest in universal health care, receiving the flu shot in the last year, smoking behavior, and perception of susceptibility to COVID-19 were analyzed.

Political party affiliation was measured as a multiple choice question with the options of “democrat/lean liberal/progressive,” “republican/lean conservative,” “independent,” and “other.” Due to low response rates of the “other” category, the independent and other category were merged, and re-coded into “independent/other.” Universal health care was measured on a likert
scale of “strongly favor” to “strongly oppose” to determine if the participants would rather have universal health care similar to Medicare. During analysis, the data was merged from the original categories of “strongly favor” and somewhat favor into “favor”, somewhat oppose and strongly oppose into “oppose”, and did not change the category of no answer. The variable of flu shot last year was measured as a yes or no multiple choice question. Smoking behavior was tested as a categorical multiple choice question on current vaping or smoking of tobacco products with the options of never, occasionally, regularly, and daily. The categories of regularly and daily were merged into the category “regularly/daily.” Lastly, perceived susceptibility as part of the HBM scale was measured as a categorical multiple choice question on participants’ chance of catching COVID-19 from the 6 point likert scale options of very high, high, moderate, low, very low, and none. During data analysis, the original categories of very high and high were merged to create “high,” the categories of low, very low, and none were merged to “low,” and the moderate category was unchanged. The dependent variable of intention to vaccinate was measured from the likert multiple choice question, “if a vaccine to prevent COVID-19 were available today, would you:” with the options as definitely get the vaccine, probably get the vaccine, probably not get the vaccine, and definitely not get the vaccine.

The demographics of political party affiliation and overall age range were identified to describe the sample of college student participants. The political party affiliation demographic combined the categories of “independent” and “other” to make the “independent/other” category as stated earlier. This was re-coded because the “other” category had too few responses to have its own independent category. The overall age range, gender, and class standing of the college students that participated in the survey were also measured as descriptive statistics to show the
range of students being measured. The range, mean, and standard deviation of these variables were recorded in an SPSS output.

**Results**

Frequencies were run on each categorical variable to report the sample size (N) and percentages of each answer. The data on flu shot behavior last year had all 256 responses with responses yes (n=158, 61.7%) and no (n=98, 38.3%) (Table 2). The frequencies for the variable of smoking behavior included never (n=165, 64.5%), occasionally (n=63, 24.6%), and regularly/daily (n=28, 10.9%) (Table 2). The frequencies of the final independent variable of perceived susceptibility include the 256 responses of high (n=53, 20.7%), moderate (n=108, 42.2%), and low (n=95, 37.1%) (Table 2). The frequencies run for the dependent variable of intention to receive the COVID-19 vaccine express the following: definitely get the vaccine (n=113, 44.1%), probably get the vaccine (n=83, 32.4%), probably not get the vaccine (n=42, 16.4%), and definitely not get the vaccine (n=18, 7.0%) (Table 2).

**Analysis**

A chi square test of independence was performed to examine the relationship between political party affiliation and intention to receive COVID-19 vaccine. There was a statistically significant relationship between these variables, \( \chi^2 (6, 256) = 14.40, p<0.05 \) (Table 3). The p-value being less than 0.05 rejects the null hypothesis, determining that there is a relationship between political party affiliation and intention to receive the COVID-19 vaccine among university participants. A chi square test of independence was performed to examine the relationship between interest in universal health care and intention to receive the COVID-19 vaccine. There was not a statistically significant relationship between these variables, \( \chi^2 (6, 254) = 6.17, p>0.05 \) (Table 3). A chi square test of independence was performed to examine the
relationship between receiving the flu shot last year and intention to receive the COVID-19 vaccine. There was a statistically significant relationship between these two variables, $X^2(3, 256) = 22.84, p<0.05$ (Table 3). A chi square test of independence was performed to examine the relationship between smoking behavior and intention to receive the COVID-19 vaccine. There was not a statistically significant relationship between these variables, $X^2(6, 256) = 5.40, p>0.05$ (Table 3). A chi square test of independence was performed to examine the relationship between perceived susceptibility to COVID-19 and intention to receive the COVID-19 vaccine when it becomes available. There was not a statistically significant relationship between these variables, $X^2(6, 256) = 5.97, p>0.05$ (Table 3). With the findings from the analyses above, a rejection of the null hypothesis and determination of a relationship was only seen between the variables of political party affiliation and receiving the flu shot last year when examining the intention to receive a COVID-19 vaccine. The other variables examined were interest in universal health care, smoking behavior and susceptibility to the virus. These variables did not show a statistically significant association, and therefore, no relationship between those variables and vaccination intentions can be assumed.

**Discussion**

As the COVID-19 vaccine is an emerging topic worldwide, this is one of the first studies to analyze vaccine intentions in the college population following the spike of COVID-19 cases on college campuses in fall 2020. Understanding the factors affecting college students’ intentions to receive the COVID-19 vaccine provides crucial information for public health officials when targeting the immunity of this population as the vaccine becomes available. The first major finding from the survey of JMU college students was that individuals who self-reported themselves as Democrats/liberals were more likely to have an intention to receive the COVID-19
vaccination once it becomes available. 52.6% of Democrats/liberals stated they would definitely get the vaccine, compared to 36.6% of Republicans/conservatives, and 38.0% of Independents/others. Due to the lack of existing research on the COVID-19 vaccine, existing findings from flu vaccine studies were used to provide insight into differences in vaccination rates between political parties. Existing literature on the flu vaccine has similarly expressed that Republicans/conservatives are less likely to be vaccinated for the flu (Kannan & Veazie, 2018). Additionally, another study that looked at vaccination rates in elementary school children versus the political party affiliation of their parents found that as the number of registered Democratic parents increased over the years of 2009-2017, the number of vaccination exemptions of students decreased (Buckman et al., 2020). The similarities between previous studies and this study indicate that those who align with Democratic/liberal views are more likely to follow public health guidelines in regards to becoming vaccinated. The politicalization of the COVID-19 vaccine during this election year may have been an influencing factor in prompting the divide between political parties and intention to become vaccinated. These findings suggest greater measures may need to be taken to prompt Republicans and Independents to receive the COVID-19 vaccine in the future, at least amongst the college population.

Despite 75.8% of survey participants favoring the idea of universal health care in the United States, those who favor universal health care are not more likely to report an intention to receive the COVID-19 vaccine compared to those who oppose universal health care. This finding is consistent with previous research that found students are less concerned about affording healthcare as many students fall under their parent’s healthcare plan until age 26 (Harness et al., 2019). Interest in universal health care as a factor impacting interest in the COVID-19 vaccine may not exhibit a relationship as students do not have to consider the potential hardship of
affording health care upon hospitalization for COVID-19 or being able to afford the novel vaccine.

A further significant finding of the study was that participants who received the flu shot last year are much more likely to have an intention to receive the COVID-19 vaccine when it becomes available. Of those who received the flu shot last year, 55.1% reported they would definitely get the COVID-19 vaccine, with an additional 29.1% indicating they would probably get the vaccine. As stated earlier, comparing findings from existing literature on the flu vaccine gives some insight into vaccination behaviors of college students without existing research on the COVID-19 vaccine. Though college students historically have a lower flu vaccination rate when compared to the general population, existing literature has shown that vaccine intentions among college students are very likely if they have received a flu shot within the past year (Ratnapradipa et al., 2017). This finding can be applied as a predictive variable of individuals within the college population who may have stronger intentions to receive the COVID-19 vaccine based on previous flu vaccine behavior.

Unlike the relationship existing between the flu vaccine, this study was unable to determine if the at-risk population of tobacco smokers are more or less likely to receive the COVID-19 vaccine. In the survey, a greater majority of college students, 64.5%, indicated they never smoked or vaped tobacco products compared to the 24.6% who smoke occasionally, and 10.9% who reported themselves as regular/daily smokers. These findings differ from recent statistics published by the National Institute on Drug Abuse that report tobacco use has been sharply increasing in college-age adults due to vaping behaviors (NIDA, 2019). The lack of a relationship between tobacco use and the intention to receive the COVID-19 vaccine may be explained by the existing understanding that college students who smoke are less knowledgeable
on the risks associated with smoking (Murphy-Hoefer et al., 2004). Given that the CDC has reported tobacco use places individuals at a higher risk for severe illness from COVID, it is promising to see tobacco use rates are lower in the survey sample, ideally placing less risk of adverse outcomes for college students who contract COVID-19 (CDC, 2020).

The last finding of this study indicated that a relationship between perceived susceptibility and intention to receive the COVID-19 vaccine does not exist amongst the survey college population. Though 62.9% of participants report a moderate to high perceived susceptibility to contracting COVID, the participants do not indicate a greater intention to become vaccinated against the virus. The higher rates of perceived susceptibility to COVID-19 differ from existing research on the flu in the college population in that a majority of college students report a low perceived susceptibility for contracting influenza (Ramsey & Marczinski, 2011; Ratnapradipa et al, 2017). A previous study that applied the constructs of the HBM to understand the intentions of college students to receive the influenza vaccine also found that no significant relationship exists between perceived susceptibility and intention to receive the vaccine in a sample of college freshmen (Ratnapradipa et al., 2017). This finding is important to understand that perceived susceptibility is not a motivating factor for the college population, thus public health organizations should not rely on using campaigns with perceived susceptibility as an influence to become vaccinated when targeting college students.

Limitations

The generalizability of the study is rather narrow in application to the entire college population as the survey for this study was only administered to James Madison University upperclassmen. The study solely reports findings from JMU upperclassmen, primarily seniors, from the Health Research Methods class in the Health Science major. This small,
non-randomized selection of participants does not allow findings to accurately reflect the attitudes and perceptions of the entire population at JMU, nor the general population of college students. Additionally, the health education of Health Science majors from the sample population likely affected the attitudes of a health related topic, differing from the health knowledge of the general population. It is more likely that Health Science majors are engaging in health promoting behaviors given their education and places of work, and less likely to engage in risky health behaviors in comparison to the rest of the college population. Having participants from only the Health Sciences major at JMU affected the overall survey results and limited the findings in this study. Furthermore, the lack of existing research on COVID-19 and the COVID-19 vaccine was a limitation in regards to the ability to compare results to existing literature. As very little research exists on this topic, the findings were compared to existing research on the flu vaccine, which may not be comparable to vaccine perceptions for COVID. The final limitation of the study derives from participant bias due to the methodology of the survey administration. With the survey being administered by class professors, participants may have felt more inclined to give socially acceptable answers instead of truthful answers. Participant bias affects the overall validity of the results reported in this study.

Suggestions for Future Research

With COVID-19 as such a new and continually developing topic that researchers and medical professionals are very uncertain of, there are plenty of opportunities for future research according to the findings of this study. Additional information that will be reported in the future as more about the virus is understood will also affect what studies could be done to further understand factors affecting vaccine intentions. For the college population, multiple universities should be studied to develop a greater understanding of the general vaccine intentions of college
students. These studies should include randomized samples of all class levels, majors, political parties, and ethnicities. A more diverse sample population of college students will allow for more generalizable results and improve the limitations that existed in this study. Additionally, perceptions of the vaccine may change once vaccinations become publicly available in the coming months. Future studies can analyze vaccine intentions and vaccine behaviors once the public has experienced the reality of a COVID-19 vaccine. Once a vaccine is widely available, further research would be able to focus on specific factors that deter people from wanting to get the vaccine, including cost, side effects, and changes in politics. Furthermore, it would be beneficial to the medical community to study if those who indicate intentions to receive the vaccine actually follow through with their intentions by a longitudinal study. Lastly, research on the ability of public health initiatives to change perceptions of receiving the vaccine could be studied to improve the effectiveness of these campaigns. Due to the lack of representation of the college population in this study, further research is needed to indicate if a generalizable relationship exists in the research findings. Only with time and continued research can the limitations in this study be addressed on the vaccine intentions of COVID-19 in college students.

Conclusion

This study sought to determine what factors impact the college students intention to receive the COVID-19 vaccine when it becomes available in the future. Of the variables studied, political party affiliation and previous flu shot behavior were found to have a significant relationship with intention to receive the vaccine. Those who identify as Democrats/liberals and those who report receiving the flu shot last year are the most likely to have an intention to receive the COVID-19 vaccine. Finding an existing relationship in these factors allows political party affiliation and previous flu shot behavior to be used as predictive variables for a college
students’ intention to receive the vaccine. The other variables including perceived susceptibility, interest in universal health care, and smoking behavior were found to not be predictive variables of an individuals’ intention to receive the vaccine. These findings have important implications for public health officials to target the college population as they design public campaigns for the vaccine. Understanding the factors that make college students less willing to become vaccinated allows more focus to be placed on those who do not report favorable vaccine intentions. Properly targeting the college population is essential to achieve herd immunity with this vaccine, and have any potential for college campuses to return to normal functioning in the future. This study largely serves to expand knowledge on COVID-19 as there is very little existing research done on this novel disease. Though important findings were reported by this study, there is a continued need for future research on the perceptions of the COVID-19 vaccine as it becomes available, as more is understood about this disease, and as the political climate changes in the transition of a new presidency.

References


Table 1. Demographic Characteristics of Participants (N=256)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Variable Categories</th>
<th>N</th>
<th>Frequency (%)</th>
</tr>
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<tbody>
<tr>
<td>Gender</td>
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<td>42</td>
<td>16.4%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>214</td>
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<tr>
<td>Age</td>
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<tr>
<td>19-20</td>
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<td>24.2%</td>
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<td>Class standing</td>
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<td>Junior</td>
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<td>Senior</td>
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<td>79.3%</td>
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Table 2. Descriptive Statistics of each Variable

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<th>Universal Health Care</th>
<th>Variable Categories</th>
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<td></td>
<td>Favor</td>
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<td>----------------</td>
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<tr>
<td>Oppose</td>
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<tr>
<td>No Answer</td>
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<td>14.6%</td>
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<tr>
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<td>71</td>
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<td></td>
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<tr>
<td>Independent/Other</td>
<td>71</td>
<td>27.7%</td>
<td></td>
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<tr>
<td>Previous Flu Shot</td>
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<td></td>
</tr>
<tr>
<td>Yes</td>
<td>158</td>
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<tr>
<td>No</td>
<td>98</td>
<td>38.3%</td>
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<tr>
<td>Susceptibility</td>
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<td>High</td>
<td>53</td>
<td>20.7%</td>
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<td>Low</td>
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<tr>
<td>Smoking Behavior</td>
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<tr>
<td>Never</td>
<td>165</td>
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<td>Occasionally</td>
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<td>Regularly/Daily</td>
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<td>37.1%</td>
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Table 3. Chi-Squared Analysis

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<th>X^2 Value</th>
<th>df</th>
<th>Significance</th>
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<td>Universal Healthcare</td>
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<td>0.405</td>
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<td>-------------------------------</td>
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</tr>
<tr>
<td><strong>Political Party Affiliation</strong></td>
<td>14.40</td>
<td>6</td>
<td>0.025</td>
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<td><strong>Previous Flu Shot</strong></td>
<td>22.84</td>
<td>3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>Susceptibility</strong></td>
<td>5.97</td>
<td>6</td>
<td>0.427</td>
</tr>
<tr>
<td><strong>Smoking Behavior</strong></td>
<td>5.40</td>
<td>6</td>
<td>0.495</td>
</tr>
</tbody>
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