

**Influenza Vaccine Hesitancy Among College Students in the United States:
A Review of the Literature**

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Abstract. Objective: To review the literature on vaccine hesitancy among undergraduate students in the United States. **Participants:** Undergraduate students. **Methods:** Studies were accessed using the databases Academic Search Ultimate, Google Scholar, Science Direct, and PubMed. Searches included the keywords: “Influenza,” “Vaccine hesitancy,” “Influenza vaccine or influenza vaccination or flu vaccine,” “College students or university students or undergraduates,” and the “United States.” **Results:** Results identify trends in available research: COVID-19 and flu vaccination, racial/ethnic differences, and barriers/strategies for uptake. **Conclusions:** Despite the health burden of influenza, vaccine hesitancy remains high among college students on U.S. campuses. More research on influenza uptake and better methodological practices will advance this field.

Keywords: influenza, vaccine hesitancy, college students, university, flu vaccine

INTRODUCTION

History of Influenza Vaccine Hesitancy

Influenza vaccine hesitancy on U.S. college campuses is a public health concern. Influenza is an airborne virus that spreads through water droplets (i.e., coughing, sneezing, or speaking). According to Skyles et al¹, influenza is responsible for “140,000-170,000 hospitalizations and 12,000–52,000 deaths annually between 2010 and 2020.” Numerous research studies report high influenza prevalence in college settings, such as classrooms, dormitories, cafeterias, and hallways.^{1,2,3,4,5} Even then, college students tend to underestimate the severity of influenza. Low-risk perception of influenza is one reason for vaccine hesitancy. Vaccine hesitancy is ‘the delay in acceptance or refusal of vaccines despite availability of vaccination services.’⁶ Vaccine hesitancy is a public health threat that demands prompt action. With high *flu* prevalence and low vaccine uptake, college campuses are the ideal location for an influenza outbreak. Vaccine hesitancy increases the risk of an influenza outbreak, a significant health threat to college students. This literature review will address key trends in vaccine hesitancy research: COVID-19 and influenza vaccination, racial/ethnic differences in vaccination, and barriers/strategies for vaccine uptake.

Influenza vaccine uptake among college students is distressingly low. Few colleges mandate influenza vaccination for incoming students, unlike the meningitis/ MMR vaccines. Unsurprisingly, several studies report a low vaccination rate of 8-39% on most college campuses.^{1,2,3,5} College students are less likely to suffer from influenza-related complications or deaths. However, unvaccinated students still pose a public health threat to the community. College students increase the risk of influenza transmission through travel, work, and social

activities.^{1,2,4,5,7} Vulnerable populations (i.e., children and older people) in nearby communities are most at risk. Hence, public health officials encourage vaccination on U.S. campuses amid low vaccination rates and evidence of community transmission. However, existing barriers—low-risk perception, convenience, health insurance, and limited information—complicate mass vaccination efforts.

The COVID-19 pandemic increased influenza vaccine uptake among undergraduate students. While flu vaccine rates still fall below national standards, the pandemic created a shift in behavior. Silva et al⁶ reported a 23% increase in student vaccination between 2019 to 2021. The COVID-19 pandemic (vaccine rollout) encouraged college students to get an annual flu vaccine. Overall, U.S. adults expressed greater trust in the flu vaccine—developed 60 years ago—than the COVID-19 vaccine.⁷ A study at Brigham Young University revealed a mass increase in flu vaccination among undergraduate students—from 12.4% in 2007 to 30.5% in 2022-2023.¹ An increase in influenza vaccination during/after the COVID-19 pandemic indicates a shift in vaccine perception. Several studies reveal unforeseen benefits/consequences of the flu-pandemic association.^{1,6,7}

METHODS

Identification of Studies

I conducted a literature review using Academic Search Ultimate, Google Scholar, Science Direct, and PubMed databases. I included the following keywords in the search option: “Influenza,” “Vaccine hesitancy,” “Influenza vaccine or influenza vaccination or flu vaccine,” “College students or university students or undergraduates,” and the “United States.” I set the publication year from 2018 to 2023 to ensure recent scientific data. Five of eight studies focus on

the 2018-2019 influenza season.^{2,3,5,4,8} The other three studies collected data during the COVID-19 pandemic.^{1,6,7} Three of eight studies collected information from under/graduate students.^{3,5,6} Four of eight studies reported data on undergraduate students.^{1,2,4,7} Only one study did not focus on the college population.⁵ However, this review will principally focus on influenza vaccine hesitancy among undergraduate students in the United States. Near the end, I refined my key search to exclude graduate students.

RESULTS

COVID-19 and Influenza Vaccination Uptake

Three studies examined the impact of the COVID-19 pandemic on influenza vaccination rates. Graupensperger, Silva, and Skyles reported a significant change in influenza vaccination uptake during/after the 2020 pandemic.^{1,6,7} Two studies identified COVID-19 as a motivator for influenza vaccine uptake.^{1,6} Silva et al⁶ conducted a cross-sectional study of 234 college students and found that 53% were “more likely” to get a flu vaccine, citing the pandemic as the reason. Silva et al⁶ also found a 23% jump in vaccine uptake from 2019-2020 to 2020-2021. Similarly, Skyles et al¹ noted a 30.5% increase in influenza vaccination uptake after the pandemic. However, it is important to note that influenza vaccine uptake is lower than COVID-19.^{1,7} Graupensperger et al⁷ reported that 91.64% of students wanted a COVID-19 vaccine, compared to 76.04% who wanted a flu vaccine. In addition, two studies noted a shift in vaccine perception of influenza and COVID-19.^{6,7} At the University of Rhode Island, a survey reported that 79% of students were “very/somewhat concerned” with COVID-19; meanwhile, only 40% of students were “very/somewhat concerned” about the flu.⁶ Graupensperger et al⁷ recorded a similar

finding—many undergraduates ($t = 10.14$) deemed the influenza vaccine less crucial than the COVID-19 vaccine.

Racial/Ethnic Differences in Vaccination & Perception

Six research studies report conflicting information on vaccine uptake per demographic group.^{1,2,4,5,6} A 2018 survey found that 61.67% of Caucasian students were vaccinated, compared to 20.54% of Hispanics and 9.82% of African Americans.² In 2018, Ryan et al⁵ reported similar findings: 70.3% of Caucasian students were vaccinated, compared to 15.8% of Hispanics and 3.7% of African Americans. In contrast, Krieger et al⁴ noted that 38.0% of Caucasians were vaccinated, compared to 36.8% of Hispanics and 32.3% of African Americans. Three studies (2018) reported significant differences in influenza vaccine uptake per ethnic/racial group.^{2,4,5} Gandhi, Krieger, and Ryan noted that vaccine uptake among racial/ethnic minorities is lower than in white students.^{2,4,5} This data is consistent with the broader literature on race and vaccination in the U.S.^{2,4,5} In contrast, one study reported a *possible* shift in vaccine uptake per racial/ethnic demographic.⁶ In 2020, Silva et al⁶ reported a new finding—non-white students ($P = 0.031$) expressed greater fear of influenza compared to their white counterparts. More information is needed to confirm the impact of COVID-19 on influenza vaccine uptake for students of color.

Barriers to Influenza Vaccine Uptake

Current research identifies common barriers to influenza vaccination among undergraduates. Five of eight studies noted ‘low-risk perception’ as a barrier to vaccination.^{1,2,3,5,7} According to Habighorst et al,³ 23% of unvaccinated students ($n=135$) believed they were not at

risk of contracting influenza. Gandhi and Bozer² surveyed 365 undergraduates to record vaccine attitudes and found that 27.1% of unvaccinated college students listed low-risk perception as a barrier. Ryan et al⁵ also reported a similar result—31.5% of students perceive influenza as low risk, abstaining from vaccination. Another barrier to influenza uptake is convenience/accessibility. Four studies identified inconvenience (i.e., lack of time) as a crucial barrier for busy adults.^{1,2,4,5} Gandhi and Bozer² reported that 19.2% of participants listed *a busy schedule and lack of time* as the second highest barrier to vaccination.¹ Similarly, Krieger et al⁴ found that 17.09% of unvaccinated students cited time as a prime barrier. Ryan et al⁵ reported a similar finding: 61.2% of students indicated the *loss of time* as a reason not to vaccinate. Six of eight studies described accessibility (i.e., time, unclear locations, & appointment conflicts) as a prime concern.^{1,2,3,4,5,6} Habighorst et al⁷ found that 47% of unvaccinated participants would strongly consider vaccination—if walk-in appointments were available—which suggests that accessibility is a barrier. Skyles et al¹ noted that convenience remained a barrier in 2023—college students possess low awareness of potential locations for vaccination ($p=0.8998$).

Strategies to Increase Vaccination

All eight studies recommended strategies for vaccine improvement among students. Six studies noted that healthcare providers (i.e., doctors, nurses, pharmacists) improve vaccination uptake among college students^{1,2,4,5,6,8} In 2018, Ryan et al⁵ surveyed 558 undergraduate students at the University of Florida. Of 558 students, 36.9% of undergraduates preferred to receive information from a physician or healthcare provider.⁵ A visit to a health provider can motivate college students to receive a flu vaccine. Lu et al⁸ reported that adults (>18) were likelier to get a vaccine per doctor's recommendation. Similarly, Silva et al⁶ noted that 99% (n = 235) of

participants reported they were “very/somewhat likely” to receive a vaccine per a doctor's recommendation. Moreover, 91% (n = 215) of students were “very/somewhat likely” to vaccinate per the pharmacist's recommendation.⁷ In contrast, Skyles et al¹ reported that vaccine encouragement was less effective in 2023 compared to 2007. Vaccine uptake remains low despite increased encouragement—43.7% of *unvaccinated* students refused to vaccinate despite a recommendation from a healthcare provider.¹

Five studies promoted make-shift health clinics (i.e., free or discounted) to encourage influenza vaccination.^{2,3,4,5,6} Ryan⁵ and Habighorst⁷ recommended the establishment of no-cost health clinics in high-traffic areas, such as dorms, dining halls, unions, and libraries. Make-shift clinics in convenient, accessible locations will encourage busy students to receive a flu vaccine without the hassle of finding a location/making an appointment.^{2,3,4,5} Gandhi and Bozer² also found that no-cost vaccine clinics can improve vaccination uptake among uninsured college students. Furthermore, seven of eight studies suggested vaccine campaigns to improve influenza awareness & vaccine uptake among college students.^{1,2,3,4,5,6,7}

Two studies in this review recommended vaccine campaigns to improve uptake among Freshmen.^{2,5} Ryan et al⁵ argued that Freshmen face unique barriers (i.e., limited experience/ new healthcare providers) that threaten vaccine uptake. In this 2018 study, only 16.1% of Freshmen were vaccinated compared to 24.9% of Sophomores and 29.5% of Juniors.⁵ Gandhi and Bozer² reported similar vaccine uptake among Freshmen—only 13.39% received a flu vaccine compared to 35.71% of Seniors. However, two studies reported a higher vaccination rate for Freshmen compared to upper-classmen.^{4,5} Krieger et al⁴ surveyed 1,021 undergraduate students and found that 45.5% of Freshmen were vaccinated compared to 31.1% of Seniors. Finally, five

of eight studies reported higher vaccine uptake among health-related disciplines, which indicates a disparity in influenza vaccination per major^{1,2,4,5,6} It is important to note that certain health programs require students to be vaccinated. Hence, several studies proposed peer education as a solution—health students can provide educational resources and empower students to get their vaccines.^{2,3,4}

COMMENT

Future Directions/ Limitations

Over the past decade, existing literature on influenza vaccination among college students has multiplied. However, few studies explore racial/ethnic differences in influenza vaccine uptake. Only three studies noted racial/ethnic differences in vaccination on U.S. college campuses.^{2,4,5} In six of eight studies most participants identified as Caucasian, a poor representation of college students.^{1,2,4,5,6,8} Skewing the data further, five studies noted that a majority of participants identified as female.^{1,2,4,5,6} More research is needed to understand vaccine attitudes/perceptions by gender and race. Future studies should survey more students of color and non-female identifying students. Second, methodological limitations restrict our ability to draw accurate conclusions on vaccine uptake. For example, five of the studies on influenza vaccine hesitancy are cross-sectional.^{1,2,3,4,5} Cross-sectional studies cannot infer a temporal sequence or establish a cause-and-effect relationship between variables (i.e., race & vaccine uptake). Another methodological limitation is the method of data collection. Seven of eight studies used quantitative surveys for influenza/vaccine uptake data.^{2,3,4,5,6,7,8} New data collection methods (qualitative or mixed-method) are needed to assess vaccine hesitancy in college students. Despite these limitations, the literature includes strategies to promote vaccination on college campuses.

Several studies encourage the need for educational campaigns to increase vaccine uptake.^{2,3,4,5,6,7}

Other studies recommend free or discounted clinics in high-traffic areas to encourage busy/unmotivated/uninsured students to receive a vaccination.^{2,3,4,5,6}

Conclusions

Despite the health burden of influenza, vaccine hesitancy remains high among college students on U.S. campuses. In the United States, physicians recommend everyone (6 months and up) receive an annual influenza vaccine.⁵ Unfortunately, influenza vaccine uptake remains low on most college campuses. Barriers to vaccination include low-risk perception, inconvenience (i.e., time), and limited information. College students are less likely to perceive influenza as a health threat; consequently, vaccination rates remain low, particularly among people of color. Moreover, students mention *inconvenience* as a crucial barrier to vaccination. Existing literature reveals shifting trends in influenza vaccination during the COVID-19 pandemic. Studies also recommend different strategies (free walk-in clinics, health provider recommendations, and vaccine campaigns) to increase influenza vaccination among undergraduate students. More research on influenza attitudes/uptake among non-white students and better methodological practices will advance this field.

NOTE

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