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SHORT REPORT



# COVID-19 vaccine hesitancy among youth

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**ABSTRACT**

The purpose of this evaluation is to describe COVID-19 vaccine hesitancy among a sample of youth aged 12–15 and inform efforts to increase vaccination uptake among youth populations. We used data collected in May 2021 through a health education program for 9th graders (N = 345). We used Spearman correlations and chi-square tests to assess the statistical significance of bivariate relationships. Less than half of students (42%) reported they are not hesitant at all about getting a COVID-19 vaccine. The remainder reported they were "a little hesitant" (22%), "somewhat hesitant" (21%), or "very hesitant" (15%). There were no statistically significant differences across age, gender, race/ethnicity, parental education, self-reported grades, or hours playing video games during school days. There was a statistically significant relationship between COVID-19 vaccine hesitancy and hours of TV watched during school days. The prevalence of COVID-19 vaccine hesitancy in this sample is high, but more research is needed to estimate its prevalence for youth at the state or national level. Correlates of COVID-19 vaccine hesitancy among adult populations may not match those found in youth populations. Research which recognizes youth as agentic rather than passive participants in decision-making opens opportunities for developing age-appropriate health communication and interventions for vaccination.

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On May 10, 2021, the United States (US) Food and Drug administration expanded the Emergency Use Authorization for the Pfizer-BioNTech COVID-19 Vaccine to include adolescents aged 12–15.[1] Although severe cases of COVID-19 are less common in this age group, vaccination is critical to reducing transmission of the virus and working toward population immunity. Given that 24% of the US population is under age 18, if no children were vaccinated, 100% of all adults would have to be vaccinated to achieve 76% immunity in the population.[2]

The World Health Organization has identified vaccine hesitancy as a major public health crisis.[3] Vaccine hesitancy has been identified as a significant barrier to ending the COVID-19 pandemic.[4] COVID-19 vaccine hesitancy among adults varies based on age, gender, race/ethnicity, education, and sources of information.[5–8] Age has been one of the most consistent correlates of vaccine hesitancy among adults.[5–8] However, no prior studies have assessed COVID-19 vaccine hesitancy among youth aged 12 to 15, and very few studies have assessed general vaccine hesitancy or attitudes in children or adolescents.[9] Research which has surveyed adolescents directly has focused primarily on influenza vaccination.[10] Understanding hesitancy among youth is important not just because of the protection vaccination provides, but also because the attitudes of children may influence their peers and even their parents.[11]

To help fill this gap, cross sectional survey data were collected using a 10 to 15-minute survey of 9th grade students enrolled in a health education program delivered in-class and online at four junior high schools. The evaluation survey was administered over a one-week period in May 2021 and included a question on COVID-19 vaccine hesitancy. Data were collected using REDCap, an electronic survey and data management software.[12] The evaluation was reviewed and provided an exemption from the University of Arkansas for Medical Sciences Institutional Review Board #260270. Unique respondent ID numbers were assigned to maintain student confidentiality and to link responses to sociodemographic and other survey data collected earlier in the year, including age, gender, race and ethnicity, parent education, self-reported grades, and self-reported school day activities (e.g. hours watching television and playing video games). Data were collected by four schools using the Wyman Survey.[13]

To assess COVID-19 vaccine hesitancy among youth, we amended an existing measure of general vaccine hesitancy to specifically capture youth attitudes toward the COVID-19 vaccine.[14] Students were asked: "Overall, how hesitant are you to receive a COVID-19 vaccine?" Response options included "Not at all hesitant," "A little hesitant," "Somewhat hesitant," and "Very hesitant." This measure was recoded such that students who responded they were "Not at all hesitant" were coded zero, while all other responses were coded one to indicate some level of hesitancy. We used Spearman correlations and chi-square tests to assess the statistical significance of bivariate relationships.

A total of 442 students were enrolled in the health education program, and 345 took the evaluation survey that included the COVID-19 vaccine hesitancy question. The response rate was 78%. As shown in Table 1, we report sociodemographic and

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**Table 1.** COVID-19 vaccine hesitancy among Northwest Arkansas youth.

| | Total Col. Freq. (%) | Hesitant Row Freq. (%) | Not Hesitant Row Freq. (%) | ρ or χ2 (*p*-value) |
|---|---|---|---|---|
| **Age (mean)** | 14.51 | 14.49 | 14.55 | −.016 (.813) |
| **[a]Gender** | | | | 3.57 (.059) |
| Girls | 143 (43) | 61 (69) | 27 (31) | |
| Boys | 185 (55) | 63 (56) | 49 (44) | |
| **Race/Ethnicity** | | | | .245 (.970) |
| Hispanic or Latino | 189 (58) | 89 (61) | 57 (39) | |
| Native Hawaiian and Pacific Islander | 35 (11) | 15 (62) | 9 (38) | |
| Non-Hispanic White | 75 (23) | 38 (61) | 24 (39) | |
| Multiracial/Other Races | 27 (8) | 10 (56) | 8 (44) | |
| **Parents' Education** | | | | 1.91 (.385) |
| College Graduate | 79 (29) | 25 (53) | 22 (47) | |
| High School Graduate | 92 (34) | 40 (63) | 24 (37) | |
| Less than High School | 103 (38) | 39 (66) | 20 (34) | |
| **Self-reported Grades** | | | | 1.24 (.734) |
| Mostly A's | 118 (38) | 65 (62) | 40 (38) | |
| Mostly B's | 109 (35) | 50 (61) | 32 (39) | |
| Mostly C's | 64 (20) | 26 (57) | 20 (43) | |
| Mostly D's or F's | 23 (7) | 10 (50) | 10 (50) | |
| **[b]Screen Hours per School Day** | | | | |
| Watching TV **(mean)** | 2.37 | 2.47 | 1.99 | .140 (.048) |
| Playing Video Games **(mean)** | 3.47 | 3.69 | 3.67 | −.009 (.898) |

Percentages may not sum to 100 due to rounding.
[a]Fewer than 10 reported a nonbinary or self-described gender.
[b]Measurement is not in continuous hours. Responses were scored from 0 to 6. 0 = they do not do this activity; 1 = less than an hour; 2 = 1 hour; 3 = 2 hours; 4 = 3 hours; 5 = 4 hours; 6 = 5 or more hours per day.

COVID-19 vaccine hesitancy data across student age, gender, race and ethnicity, parent education, self-reported grades, and self-reported school day activities. Less than half of students (42%) reported they are not hesitant at all about getting a COVID-19 vaccine. The remainder reported they were "a little hesitant" (22%), "somewhat hesitant" (21%), or "very hesitant" (15%).

The highest prevalence of hesitancy in this youth sample was among Native Hawaiian and Pacific Islander students (62%), followed by non-Hispanic White students (61%), Hispanic or Latino students (61%), and the combined group of other and multiracial students (56%), though these differences were not statistically significant. There were no statistically significant differences across age, gender, race/ethnicity, parental education, or reported grades (Table 1).

Hesitant students' average hours of TV watched on a school day was higher (2.47) than those who were not hesitant (1.99) about COVID-19 vaccination. Hours of TV watched on a school day was positively associated with COVID-19 hesitancy (rs(199) = .140, $p$ = .048). Hesitant students' average hours of video game play on a school day (3.69) was about the same as those who were not hesitant (3.67) about COVID-19 vaccination. Hours of video game play on a school day was not significantly associated with COVID-19 hesitancy (rs (199) = −.009, $p$ = .898).

We found that the majority (58%) of youth reported some degree of hesitancy toward the COVID-19 vaccine; however, only a small percentage (15%) reported they are very hesitant. Although comparisons across surveys are imperfect due to differences in measurement, the Household Pulse Survey estimates that 18% of adults in Arkansas are hesitant.[15] Given extant research showing significant differences in hesitancy across sociodemographic characteristics among adults,[16–18] we expected to find similar results among youth. While Native Hawaiian and Pacific Islander students reported the highest level of hesitancy, we did not find any statistically significant differences in hesitancy across race/ethnicity or other sociodemographic factors, parent education, or self-reported academic performance. Our findings diverge from most research on racial and ethnic differences in hesitancy toward COVID-19 vaccines in the US;[16,17] however, all extant research has focused on adults rather than adolescents. Moreover, recent research has shown that racial and ethnic differences are narrowing, with large decreases in COVID-19 vaccine hesitancy among Black and Hispanic individuals.[19] Finally, the average hours spent watching TV on a school day was higher among students who reported some degree of hesitancy toward COVID-19 vaccination. This was the only bivariate relationship which was statistically significant.

This study has limitations. While data were collected about parents' education, student grades, and screen time during the school day, the data were reported by students rather than the parents. Further, students who enrolled in the health education program may be different from the general student population, and our survey did not reach students who attended school virtually due to COVID-19. Responses were self-reported and may be influenced by response bias. Despite these limitations, this is the first study to report COVID-19 vaccine hesitancy among youth under the age of 18. Future research should inquire further about the reasons for hesitancy among youth and the role that watching television or other media sources may play in shaping youth vaccine hesitancy. The type of television and media sources may also have a differential effect and should also be examined given that prior studies have shown these factors matter in shaping views about the pandemic and its seriousness.[20] Researchers should also consider collecting dyadic data including both youth and parents to assess discordance in vaccine hesitancy within households.

Vaccination of youth is critical to the goal of population immunity.[2] Although parents are often the decision-makers regarding vaccination, the attitudes of children themselves may influence the decisions parents make.[11] Moreover, in many states, children can consent to vaccination without a parent, or the provider can waive parental consent.[21] The lack of research including youth implicitly casts them as passive rather than agentic in processes of health care decision-making. Research which recognizes the agency of youth opens opportunities for better understanding vaccine hesitancy, spheres of influence around vaccination decisions within families, and possible areas for developing health communication interventions tailored specifically toward youth populations.

## Disclosure statement

This evaluation received an exemption from the University of Arkansas for Medical Sciences Institutional Review Board (#260270). D. E. Willis contributed to the analysis and interpretation of the data and drafting and revision of the article. J. Presley and P.A. McElfish contributed to the conceptualization and design of the study, interpretation of the data, and drafting and revision of the article. M. Williams and N. Zaller contributed to the interpretation of the data and revision of the article. All authors approved the final version of the article. No financial disclosures or conflicts of interest were reported by the authors of this paper.

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