Research Article ISSN 2639-9458

Microbiology & Infectious Diseases

Association Between University Student Political Party Alignment and HPV Vaccination Rates, HPV Knowledge, and Risk Factors

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Received: 03 Jun 2024; **Accepted:** 14 Jul 2024; **Published:** 26 Jul 2024

Citation: JaNiese E Jensen, Linder Hagstrom Wendt, Joseph Spring, et al. Association Between University Student Political Party Alignment and HPV Vaccination Rates, HPV Knowledge, and Risk Factors. Microbiol Infect Dis. 2024; 8(3): 1-5.

ABSTRACT

Background: *To determine the association between university student political party alignment and HPV vaccination rates, HPV knowledge, and risk factors.*

Methods: *A survey was emailed in April 2024 to 28,095 students enrolled at the University of Iowa. Surveys were entered online and downloaded into a REDCap database for analysis.*

Results: *The majority (54%) of 1,380 respondents were aligned with the Democratic party, 16% Republican Party, 2.4% Libertarian Party, 23% Independent, and 4.9% other parties. The percentage of female respondents was higher in students aligned with the Democratic voters (81%) compared with Republican (71%) and Independent (68%) voters. The overall HPV vaccination rate for respondents was 82% with HPV vaccination rates highest among females 88% vs 73% males, Democrats 88% vs 75% Republican, 76% Independent and 87% Health Science students. Median age at first HPV vaccine dose was 14. For females 21 or older, 76% of Democrats vs 69% Republican, and 65% Independent had received a Pap smear, p=0.040. 94% of Democrat vs 75% Republican and 83% Independent affiliated students recommended others get the HPV vaccine, p=<0.001. Age of first sex, percent sexually active, knowledge of HPV prevention, non-heterosexual orientation, and vaccination rates for COVID-19 and influenza were higher among Democrats. Number of sex partners, percentage with history of sexually transmitted infection, and reasons for not getting the HPV vaccine were similar between aligned Democrats, Republicans, and Independents.*

Conclusion: *HPV vaccination rate was highest among females and Democrats as was knowledge of HPV prevention and disease and support for HPV vaccination.*

Keywords

HPV, Vaccination, Student, University, Political affiliation, Risk factors.

Introduction

Human papillomavirus (HPV) is the most common sexually transmitted infection (STI) with over 200 HPV strains of which high risk strains can cause cervical cancer, anal cancer, oropharyngeal cancer, and penile cancer [1,2]. Low risk strains can cause plantar warts, genital warts, and a number of skin related diseases [2]. The risk of HPV infections increases significantly with increasing number of sex partners [3]. Although most commonly transmitted through sexual contact, HPV transmission can occur through contact with fingers, fomites, and mouth-skin contact [4]. The Centers for Disease Control and Prevention (CDC) estimates that 42.5 million people are infected with HPV in the United States (US) [1]. Fortunately, there is a very effective HPV vaccine that can prevent HPV infection and subsequent disease if given to young girls and boys prior to sexual debut and has been shown to be nearly 100% effective [5]. All children aged 11-12 years should

receive two doses of the HPV vaccine and those aged 15-26 years should receive three doses of the vaccine according to current CDC recommendations [6]. HPV vaccination can be started at 9 years old and may be given up to 45 years old [6]. Uptake of the HPV vaccine has been less than optimal. As of 2022, 76% of US adolescents aged 13-17 years had received at least one dose of the vaccine, while 62.6% had completed the series [7]. In Iowa, the uptake rate has been 55.8% for the completed vaccine series and has decreased over the last several years [8].

Acceptance of vaccination in general has been declining due to a number of perceived health risks and political concerns especially during the recent COVID-19 epidemic [9,10]. Given the significant amount of sexual activity and number of sexual partners in young adults, unvaccinated university students are likely to be at high risk of HPV infection [11,12]. The reasons for abstaining from HPV vaccination are likely varied and could be influenced by political beliefs. We had previously conducted and published the results of an HPV vaccine survey of students at the University of Iowa to determine the uptake and perceptions of the HPV vaccine [13]. One question on the survey asked the political alignment of the student, and we have now conducted a separate and original analysis of the association between university student political party alignment and HPV vaccination rates, HPV knowledge, and risk factors.

Methods

A 5-minute survey was emailed to 28,095 (93.9%) of 29,908 currently enrolled University of Iowa students in April 2024 except to those students who had blocked their student directory email as allowed by the Family Educational Rights and Privacy Act. Surveys were entered online and responses automatically downloaded into a REDCap database for analysis. Those who completed and submitted a survey were eligible for one of three $1000 scholarships applied to tuition by entering name and email address in a separate link. Students had one week to respond. Students acknowledged consent by completing the survey, and were aware the survey was voluntary and not all questions needed to be answered. Summary statistics of responses were reported using medians and inter-quartile ranges for continuous variables and with counts and percentages for categorical variables. The survey and conduct of the survey were approved by the University of Iowa Institutional Review Board (IRB#202403543).

Results

1,380 (4.9%) of 28,095 students submitted completed surveys. Overall, the median age was 22. The majority were female (76%), undergraduate students (56%), and in-state residents (68%). Sexual identity/orientation was as follows: heterosexual 73%, bisexual 17%, gay 3.3%, lesbian, 2.6%, asexual 1.7%, other 2.2%. The highest number of respondents were in the College of Liberal Arts (N=602, 44%) and College of Medicine (N= 213, 15%).

The demographics and college of respondents categorized by political party alignment are shown in Table 1. The majority of 1,380 respondents were aligned with the Democratic party (54%), followed by the Republican Party 16%, the Libertarian Party 2.4%, Independent 23%, and 4.9% other parties. The percentage of female respondents was higher in students aligned with the Democratic party (81%) compared with the Republican party (71%) and Independents (68%). The political alignment by college shows the highest percent aligned as Democrat being in the College of Medicine and the lowest percent in the College of Dentistry (Table 1). Age of first sex, percent sexually active, and number of sex partners who had had sex were higher among Democrats (Table 2).

Table 1: Demographics and student status of respondents by political alignment.

Characteristic	**Overall**, N = 1,380[1]	**Democrat**, N = 735[1]	**Republican**, N = 213[1]	**Independent**, N = 313[1]	**Other**, N = 119[1]
Age	22 (20, 25)	22 (20, 26)	21 (20, 24)	21 (20, 24)	23 (21, 27)
Sex assigned at birth					
Male	331 (100%)	136 (41%)	62 (19%)	98 (30%)	35 (11%)
Female	1,044 (100%)	597 (57%)	151 (14%)	212 (20%)	84 (8.0%)
(Missing)	5	2	0	3	0
In which college are you currently enrolled?					
Carver College of Medicine	213 (100%)	138 (65%)	34 (16%)	31 (15%)	10 (4.7%)
College of Dentistry	34 (100%)	9 (26%)	18 (53%)	4 (12%)	3 (8.8%)
College of Education	68 (100%)	32 (47%)	11 (16%)	15 (22%)	10 (15%)
College of Engineering	73 (100%)	27 (37%)	10 (14%)	27 (37%)	9 (12%)
College of Law	26 (100%)	16 (62%)	2 (7.7%)	7 (27%)	1 (3.8%)
College of Liberal Arts and Sciences	602 (100%)	337 (56%)	71 (12%)	134 (22%)	60 (10.0%)
College of Nursing	79 (100%)	38 (48%)	15 (19%)	19 (24%)	7 (8.9%)
College of Pharmacy	56 (100%)	30 (54%)	15 (27%)	9 (16%)	2 (3.6%)
College of Public Health	72 (100%)	41 (57%)	3 (4.2%)	25 (35%)	3 (4.2%)
Tippie College of Business	119 (100%)	44 (37%)	33 (28%)	34 (29%)	8 (6.7%)
Other	35 (100%)	22 (63%)	1 (2.9%)	7 (20%)	5 (14%)
(Missing)	3	1	0	1	1
Are you considered an in-state resident of Iowa for tuition purposes?	925 (100%)	514 (56%)	127 (14%)	209 (23%)	75 (8.1%)
(Missing)	12	5	1	4	2
	[1]Median (IQR); n (%)				

Table 2: Age of First Sexual Activity, Presence of Sexual Activity, and number of sex partners by political alignment.

Characteristic	Democrat, N = 735[1]	Republican, N = 213[1]	Independent, N = 313[1]	Other, N = 119[1]
Age of First Sexual Activity	18 (16, 19)	17 (16, 18)	17 (16, 18)	18 (16, 19)
(Missing)	141	49	78	29
Have you ever had sex? Sex is defined as vaginal, anal, or oral sexual activity.	604 (83%)	169 (80%)	236 (76%)	96 (83%)
(Missing)	4	2	3	3
Number of Sexual Partners among those who have had sex	4 (1, 8)	3 (1, 6)	3 (1, 6)	4 (2, 9)
(Missing)	146	51	79	32
[1]Median (IQR); n (%)				

Table 3: Sexual orientation by political alignment, number of sex partners, and HPV vaccination rate.

Characteristic	Number of Sexual Partners[1]	Percent Vaccinated for HPV	Democrat, N = 735[2]	Republican, N = 213[2]	Independent, N = 313[2]	Other, N = 119[2]
Sexual Identity/Sexual Orientation						
Asexual	1 (0, 2)	75%	16 (2.2%)	2 (0.9%)	2 (0.6%)	4 (3.4%)
Bisexual	4 (1, 10)	88%	175 (24%)	4 (1.9%)	37 (12%)	18 (16%)
Gay	6 (4, 18)	84%	31 (4.2%)	3 (1.4%)	9 (2.9%)	2 (1.7%)
Lesbian	1 (0, 3)	86%	30 (4.1%)	2 (0.9%)	2 (0.6%)	2 (1.7%)
Straight (heterosexual)	2 (1, 5)	81%	461 (63%)	201 (95%)	258 (82%)	86 (74%)
Other	3 (0, 10)	83%	21 (2.9%)	0 (0%)	5 (1.6%)	4 (3.4%)
(Missing)	5	5	1	1	0	3
[1]Median (IQR) [2]n (%)						

Table 4: Percent vaccinated for HPV, COVID 19 and annual influenza by political alignment.

Characteristic	Overall, N = 1,380[1]	Democrat, N = 735[1]	Republican, N = 213[1]	Independent, N = 313[1]	Other, N = 119[1]
Have you received the HPV vaccine (e.g. Gardasil)?	1,126 (82%)	642 (88%)	158 (75%)	237 (76%)	89 (75%)
(Missing)	10	5	2	2	1
Did you receive the COVID-19 vaccination at any point?	1,279 (93%)	721 (98%)	165 (78%)	286 (91%)	107 (90%)
(Missing)	2	1	1	0	0
Did you receive the annual influenza vaccination in 2023-2024?	911 (67%)	538 (74%)	115 (55%)	185 (59%)	73 (63%)
(Missing)	14	7	2	2	3
[1]n (%)					

The overall HPV vaccination rate for respondents was 82% with HPV vaccination rates highest among females 88% vs 73% males, Democrats 88% vs 75% Republican, and 76% Independent, and Health Science College students 87%. The sexuality/gender combination by political party alignment, number of sex partners, and HPV vaccination rate is shown in Table 3. HPV vaccination rates were highest among bisexual identifying students (88%) and lesbian identifying students (86%) who represented 28.1% of democratically aligned students, 2.8% of Republican, and 12.6% of Independent students. The lowest HPV vaccination rates were among asexual (75%) and straight/heterosexual identifying students (81%). Among democratically aligned students, straight/heterosexual identifying students represented 63% compared with 95% for Republican and 82% for Independent aligned students. Gay identifying students, who had the highest number of sex partners (N=6, IQR 4,18), had an HPV vaccination rate of 84%.

Table 4 shows the HPV vaccination rate compared with vaccination rates for COVID-19 and annual influenza by political affiliation. Democrat affiliation showed the highest vaccination rates for COVID-19 (98%) and annual influenza (74%).

Median age at first HPV vaccine dose was 14 (IQR 12, 16). The most common reasons for not receiving the HPV vaccine among all students and among Democrat aligned students were: "parent did not want me to get vaccine" (22% overall, Democrat 22%), "didn't know about vaccine" (overall 20%, Democrat 19%), and "vaccine was never offered" (overall 19%, Democrat 22%). 94% of Democrats vs 75% Republicans and 83% Independents recommended others get the HPV vaccine, p=<0.001. A higher percentage of student Democrats had heard of HPV prior to the survey and knew that HPV vaccination was the most effective way to prevent HPV infection. For females 21 or older, 76% of Democrats vs 69% Republican, and 65% Independent had received a Pap smear, p=0.040. Number of sex partners, percentage with history of an STI, and reasons for not getting the HPV vaccine were similar between Democrats, Republicans, and Independents.

Discussion

The majority of students aligned with the Democratic party especially among females. HPV vaccination rates were highest among females and Democrats, but still high among all students regardless of political party alignment. Knowledge of HPV

prevention and disease was significantly higher in students aligned with the Democratic party compared to other political parties. These percentages are higher than found in the general public in this age group, and somewhat higher compared with other university student studies [14,15]. According to a Pew poll, among registered voters, 56% of women and 44% of men affiliate with or lean toward the Democratic Party, which is consistent with the finding of 58% of female and 42% of male students in this study considered themselves Democrat [16].

Age of first sex, percent sexually active, knowledge of HPV prevention, non-heterosexual orientation, and vaccination rates for COVID-19 and annual influenza were higher among Democrats. Number of sex partners, percentage with history of an STI, and reasons for not getting the HPV vaccine were similar between Democrats, Republicans, and Independents.

These results are similar to findings in a Gallup survey in 2021 which found 75% of adult Americans had been vaccinated for COVID-19, but differed among party lines being 92% of Democrats, 68% of Independents, and 56% of Republicans [17].

Limitations of this study are the 4.9% response rate and the higher response rate among the health science students and women. This may have resulted in higher reported vaccination rates and greater knowledge of HPV risk factors. For example, in this survey female students represented 76% of respondents, yet the percentage of currently enrolled female students at the University of Iowa is 56% so the survey appeared to be of more interest to women than men and is not representative of the whole student body [18]. Likewise, College of Medicine students represented 15% of respondents, but College of Medicine students represent 3% of the university enrolled students [18]. The findings may not be representative of other students in other regions of the country or in other types of universities where political alignments, healthcare practices, and cultural determinants may differ.

Nevertheless, a sample size of 1,380 is robust and captures the different colleges and types of students. To our knowledge this study is the first to report the association between university student political party alignment and HPV vaccination rates, HPV knowledge, and risk factors. These findings provide data to develop and focus strategies to increase HPV vaccination rates among students at higher risk and those student groups with low vaccination rates.

Funding

Partially funded by the Mark Gilbert and Karen Simmonds Research gift fund.

Statistical support was provided by the University of Iowa Clinical and Translational Serve Award Granted with funds from the NIH (UMITR004403).

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