

## ORIGINAL RESEARCH

## Willingness of Patients from an Urban Safety-Net Dermatology Clinic to Receive a COVID-19 Vaccine

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### ABSTRACT

**Background:** While recent vaccine development has initiated a return to pre-COVID “normalcy” both in the dermatology clinic and worldwide, significant challenges remain regarding the public’s willingness to receive a COVID-19 vaccine. Dermatologists often discuss vaccinations with their patients and aid them in making evidence-based medical decisions. Previous studies have looked at the U.S. population’s willingness to receive a COVID-19 vaccine, but no studies have examined the dermatology patient population from an urban safety-net hospital. Studies have shown that understanding the target audience is the first step towards increasing vaccine acceptance.

**Methods:** A cross-sectional, telephone-based survey study was administered to 326 patients of an urban safety-net hospital from July 2020 to August 2020 in order to assess willingness to obtain a COVID-19 vaccine.

**Results:** Our survey study showed that 57.7% of patients with a recent dermatology appointment are willing to receive a COVID-19 vaccine and that safety concerns represent the main reason for patient hesitancy. Patients who do not regularly receive a flu vaccine, non-Caucasian patients, and those who know someone who tested positive for COVID-19 are less willing to receive a COVID-19 vaccine. Patients with a recent dermatology appointment are more willing to receive a COVID-19 vaccine than those who did not have a recent dermatology appointment.

**Conclusions:** Our results provide dermatologists, especially those working in urban safety-net clinics, with key information about the attitude of patients toward the COVID-19 vaccine.

### INTRODUCTION

A safe and effective vaccine against SARS-CoV-2 is essential for a return to pre-COVID “normalcy” both in the dermatology clinic and worldwide. Recently, after extensive clinical trials, the Food and Drug Administration (FDA) has granted emergency use authorization to Moderna, Inc. and Johnson & Johnson and full

approval to Pfizer, Inc., allowing vaccines to be brought to the U.S. market.<sup>1-3</sup> While the development of these vaccines represents a monumental achievement that has helped to initiate the beginnings of a return to a pre-COVID way of life, significant challenges remain regarding the public’s perception of the vaccines and the public’s willingness to receive the vaccines.<sup>4-6</sup> Currently, the U.S. population remains far from the herd immunity goal of 80%, and there has been

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significant loss to follow-up for the second vaccination.<sup>7</sup> In addition, given the lower levels of neutralizing antibody titers associated with newer strains, the need for boosters vaccines will keep COVID-19 vaccinations at the forefront of healthcare maintenance and will require continued patient education.<sup>8</sup>

While preventative immunizations are often considered a cornerstone of the primary care encounter, vaccine discussion with patients is important across all specialties, including dermatology. Dermatologists routinely discuss the need for yearly flu vaccines in immunocompromised patients, the need for the varicella zoster vaccine in older patients, and the need for adequate titers against Hepatitis B prior to starting a biologic medication. At the present time, dermatologists are also discussing the COVID-19 vaccine with their patients and encouraging skeptical patients to make evidence-based vaccination decisions. Dermatologists have been shown to play a key role in recommending the COVID-19 vaccine to their patients on immunosuppressive agents.<sup>9</sup>

Previous studies have looked at the U.S. population's willingness to receive a COVID-19 vaccine, but no studies have specifically looked at the dermatology patient population or patients from an urban safety-net hospital.<sup>4,5,10</sup> Studies have shown that understanding the target audience is the first step towards increasing vaccine acceptance, and therefore, the purpose of this study was to 1) determine what proportion of patients from an urban safety-net dermatology clinic are willing to receive a COVID-19 vaccine, 2) determine which patient factors may correlate with an unwillingness of a patient to receive a COVID-19 vaccine and 3) determine if there is a difference in attitude towards the

COVID-19 vaccine between patients who recently received dermatologic care and those who do not.<sup>11,12</sup>

## METHODS

After IRB approval, a cross-sectional telephone survey study was conducted from June 2020 to July 2020. All patients were recruited from an urban safety-net hospital (Boston Medical Center; Boston, Massachusetts). Patients younger than 18 years old and non-English or Spanish-speaking patients were excluded. A sample size calculation was performed prior to the study to ensure adequate power. Two telephone lists were created from the electronic health record which represented the two patient cohorts: 1) a dermatology patient cohort consisting of patients with a recent (within 1 month) dermatology appointment and 2) a non-dermatology patient cohort consisting of internal medicine patients without a dermatology appointment in the last year. Patients were called and asked to answer a telephone-based survey (Table 1).

**Table 1.** Survey questions

<b>1. What is your highest level of education?</b>
<b>2. What race/ethnicity do you identify with?</b>
<b>3. Do you regularly get the flu vaccine?</b>
<b>4. Have you tested positive for COVID-19?</b>
<b>5. Have any of your close friends, relatives or colleagues tested positive for COVID-19?</b>
<b>6. Would you receive a COVID-19 vaccine?</b>
<b>7. If you are unsure or unwilling to receive a COVID-19 vaccine what is your main reason for concern?</b>

Patient demographic data were collected from the electronic health record and recorded along with the survey responses. Participation in the survey was voluntary. Univariate analysis was performed to describe relationships between patient willingness to receive a COVID-19 vaccine and age, highest level of education, race/ethnicity, history of flu vaccination, and personal history or close friend/family member history of COVID-19. Multivariable chi-square analysis was performed to compare vaccination attitude between dermatology patients and non-dermatology patients. SAS Studio Version 3.8 was used for statistical analysis.

## RESULTS

### Dermatology patient cohort

163 patients with a recent (within 1 month) dermatology appointment were surveyed. Patient demographic information is provided in Table 2. The majority of respondents (57.7%, n=94) stated they were willing to receive a COVID-19 vaccine; 30.7% (n=50) stated they were unsure, and 11.7% (n=19) stated they were unwilling (Table 3). Concerns with vaccine safety represented the main reason patients were unsure or unwilling to receive a COVID-19 vaccine (73.9%, n=51). Among the patient factors analyzed, those who do not regularly receive a flu vaccine, those with family, friends, or colleagues who tested positive for COVID-19, and non-Caucasian patients were less willing to receive a COVID-19 vaccine. Those who regularly received their flu vaccine had 4.64 (95% CI 1.66, 12.94) times the odds of being willing to receive the

**Table 2.** Patient demographic data

Characteristic	Total Sample (n=326)	Dermatology patient cohort (n=163)	Non-dermatology patient cohort (n=163)
<b>Sex</b>			
Female	249 (76.4%)	111 (68.1%)	138 (84.7%)
Male	77 (23.6%)	52 (31.9%)	25 (15.3%)
Mean age (Standard Deviation)	47.1 (16.9)	44.8 (17.0)	49.5 (16.5)
<b>Self-identified race/ethnicity</b>			
African American	114 (35.0%)	37 (22.7%)	77 (47.2%)
Asian	8 (2.5%)	6 (3.7%)	2 (1.2%)
Biracial	14 (4.3%)	5 (3.1%)	9 (5.5%)
Caucasian	91 (27.9%)	64 (39.3%)	27 (16.6%)
Hispanic/Latino	69 (21.2%)	39 (23.9%)	30 (18.4%)
Other	23 (7.1%)	10 (6.1%)	13 (8.0%)
Not disclosed	7 (2.0%)	2 (1.2%)	5 (3.1%)
<b>Highest Level of Education</b>			
Elementary	9 (2.8%)	1 (0.6%)	8 (4.9%)
Middle School	7 (2.1%)	7 (4.3%)	0 (0%)
Some High School	15 (4.6%)	6 (3.7%)	9 (5.5%)
High School Diploma	83 (25.5%)	43 (26.4%)	40 (24.5%)
Associate's degree	20 (6.1%)	11 (6.7%)	9 (5.6%)
Bachelor's Degree	93 (28.6%)	41 (25.1%)	52 (31.9%)
Master's Degree	42 (12.9%)	22 (13.5%)	20 (12.3%)
Doctorate/Professional School	6 (1.8%)	4 (2.5%)	2 (1.2%)
Other	7 (2.1%)	4 (2.5%)	3 (1.8%)
Not disclosed	6 (1.8%)	0 (%)	6 (3.7%)

**Table 3.** Willingness to receive a COVID-19 vaccine and reasons for hesitancy

	Total Sample (N=326)	Dermatology patient cohort (n=163)	Non-dermatology patient cohort (n=163)
<b>Would you receive a COVID-19 vaccine?</b>			
<b>Yes</b>	171 (52.5%)	94 (57.7%)	77 (47.2%)
<b>No</b>	61 (18.7%)	19 (11.7%)	42 (25.8%)
<b>Unsure</b>	94 (28.3%)	50 (30.7%)	44 (27.0%)
<b>What is your main reason for hesitancy or unwillingness to get a COVID-19 vaccine?</b>			
<b>Concern about safety</b>	87 (56.1%)	51 (73.9%)	36 (41.9%)
<b>Concern about efficacy</b>	7 (4.5%)	3 (4.3%)	4 (4.6%)
<b>Against personal/religious beliefs</b>	7 (4.6%)	4 (5.8%)	3 (3.5%)
<b>Already had COVID-19, no need</b>	1 (0.6%)	0 (0%)	1 (1.2%)
<b>Other</b>	35 (22.6%)	10 (14.5%)	25 (29.1%)
<b>Not disclosed</b>	18 (11.6%)	1 (1.5%)	17 (19.7%)

COVID-19 vaccine than those who do not regularly receive the flu vaccine ( $p=0.0020$ ). Those with close family, friends, or colleagues who tested positive for COVID-19 had 0.326 (95% CI 0.1188, 0.8954) times the odds of being willing to receive a COVID-19 vaccine compared to those who did not ( $p=0.0252$ ). Non-Caucasian patients had 0.272 times the odds of being willing to

receive a COVID-19 vaccine compared to Caucasian participants (95% CI 0.0841, 0.8827,  $p=0.0202$ ). There was no association between willingness to receive the COVID-19 vaccine and age, level of education, or personal history of COVID-19.

### Combined data (dermatology and non-dermatology patient cohorts)

In total, 326 patients were surveyed (163 patients with a recent dermatology appointment and 163 patients without a recent dermatology appointment) with a mean age of 47.1 years (SD=16.9). Overall, 52.5% (171/326) of patients stated they were willing to receive a COVID-19 vaccine (47.2% in non-dermatology cohort; 57.7% in the dermatology cohort). Those with a recent dermatology appointment had 2.69 (95%CI 1.4517, 5.0164) times the odds of being willing to receive the COVID-19 vaccine compared to those without a recent dermatology appointment ( $p=0.0014$ ).

## DISCUSSION

Studies show patients are more willing to receive a vaccination if the vaccination is recommended by a healthcare provider.<sup>13</sup> Because of this, all healthcare providers, including dermatologists, play a key role in vaccine education. Vaccine education is especially important today given the plethora of misinformation surrounding the COVID-19 vaccine. Even prior to the COVID-19 pandemic however, dermatologists played an important role in vaccine education given that many dermatologic conditions require immunosuppressant medications and thus up to date vaccinations. Additionally, given the frequent follow-up required for many skin conditions, dermatologists have the opportunity to routinely educate patients on important preventative health measures

such as the need for vaccinations. Given dermatologists often engage in vaccine discussion, it is important for us to understand the overall attitude of our patient population towards vaccines, including the COVID-19 vaccine. Therefore, our study investigated the attitudes of dermatology patients in an urban safety-net hospital toward COVID-19 vaccines and determined which patient factors were associated with an increased or decreased willingness to receive the vaccine. Once armed with this knowledge, physicians working in similar outpatient, subspecialty safety-net clinics can focus their vaccine education efforts appropriately.

Our study showed that 57.7% of dermatology patients from an urban safety-net hospital are willing to receive a COVID-19 vaccine and that safety concerns represent the main reason for patient hesitancy. This proportion of willing patients is similar to the CDC's most recent data that demonstrated 52.4% of those eligible to be vaccinated have received a COVID-19 vaccine.<sup>14</sup> Additionally, our findings are in-line with recent surveys which indicate many people in the general population are concerned with vaccine safety.<sup>5</sup> A systematic review of 30 articles analyzing willingness to receive a COVID-19 vaccination during the first year of the pandemic found rates between 27.7%-93.3% with significant differences when stratified by socio-demographic factors.<sup>15</sup>

For our dermatology cohort, only flu vaccination history, self-identified race/ethnicity, and having friends, relatives, or colleagues who tested positive for COVID-19 correlated with patient attitude toward the vaccine. Patients who did not regularly receive a flu vaccine, non-Caucasian patients, and those with friends, family, or colleagues who tested positive for

COVID-19 were less willing to receive a COVID-19 vaccine. A previous study similarly found that influenza vaccination was a positive predictor for acceptance of a COVID-19 vaccine.<sup>16</sup> Additionally, previous survey studies have demonstrated that race/ethnicity often plays a role in vaccine acceptance.<sup>5,10</sup> It was surprising that patients close to individuals who tested positive for COVID-19 were more hesitant to receive a COVID-19 vaccine, but this finding has been observed previously.<sup>16</sup> While this avoidance predictor has not been thoroughly studied, it could be explained by a perceived low mortality rate of COVID-19. These findings emphasize the need for vaccine discussion and education of these patient cohorts.

Patients who had a recent dermatology appointment were overall more willing to receive a COVID-19 vaccine than those without a recent dermatology appointment. Only 11% of the dermatology cohort was unwilling to receive a vaccine but 25.8% of the non-dermatology cohort was unwilling to receive a vaccine. The percentage of unwilling dermatology patients is lower than that of the general population given a recent survey study estimated over 20% of the general population does not intend to get a COVID-19 vaccine.<sup>14</sup> This finding may be explained by the increased health literacy and vaccine literacy of patients able to receive subspecialty care. Navigating the healthcare system can be complex, and patients with low health literacy often encounter barriers to specialty care such as the need for a referral and active insurance.<sup>17</sup> Studies have also shown that patients with low health literacy are less likely to partake in preventative health behaviors such as immunization.<sup>18</sup> Interestingly, however, our study did not show a correlation between level of education and willingness to receive a

COVID-19 vaccine, indicating that advanced education does not always correlate with vaccine acceptance.

Importantly, our study included a more ethnically diverse patient population than previous studies on vaccine acceptance.<sup>4,13</sup> The majority of our surveyed patients identified as non-Caucasian, and therefore our findings help to highlight the perspectives of a racially and ethnically heterogeneous population. Additionally, our study focused on vaccine acceptance rates at an urban safety-net hospital and thus sheds light on the perspective of patients who might encounter more healthcare disparities than other patient populations.

Dermatologists should feel empowered in their ability to educate patients on the COVID-19 vaccine. In our study, patients frequently expressed concerns that the COVID-19 vaccine development appeared rushed and worried about the safety of vaccinations that had yet to receive FDA approval. Similarly, patients self-described as immunocompromised were weary of possible adverse side effects. Other patients anecdotally cited histories of still getting the flu after receiving the influenza vaccine as reasons to doubt vaccine efficacy. When engaging with vaccine hesitant patients, dermatologists may turn to the evidence-based guidelines and scripts provided by the American Academy of Dermatology.<sup>19</sup> Therein, dermatologists can assure patients that the vaccines have been properly tested and are recommended for the vast majority of the population including immunocompromised individuals. Likewise, dermatologists may combat the idea of “breakthrough” infections as being a failure of the vaccination process by providing patients with data demonstrating reduced disease severity and better COVID-19 infection outcomes of those vaccinated vs.

those unvaccinated.<sup>20</sup> Armed with such information, dermatologists will engage patients in shared decision-making that will hopefully translate into increased vaccine acceptance.

There are several limitations to our study. First, our study only included patients from a single urban safety-net hospital, and therefore the findings are less generalizable to the overall United States population. Additionally, our study was performed in the Summer of 2020, and as new data about COVID-19 and the vaccines emerge, patient attitude toward vaccination may change. Despite these limitations, our results provide dermatologists, especially those working in urban safety-net clinics, with key information about the attitude of our patients toward the COVID-19 vaccine.

## CONCLUSION

While significant challenges remain regarding the public’s willingness to receive the COVID-19 vaccinations, dermatologists may feel empowered in their ability to aid patient decision-making and improve vaccine uptake. Our study demonstrates that patients with a recent dermatology appointment are more willing to receive a COVID-19 vaccine than those without a recent dermatology appointment, demonstrating the power of the tertiary care patient-provider relationship. Non-Caucasian patients were less willing to receive a COVID-19 vaccination, most often due to safety concerns, highlighting the importance of outreach to these more traditionally marginalized patient populations. We hope that vaccine education for those populations most in-need will translate into increased vaccine acceptance now and as COVID-19 boosters emerge and remain at the forefront of healthcare maintenance.

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**References:**

1. Baden, L.R. *et al.* (2021) Efficacy and Safety of the mRNA-1273 SARS-CoV-2 Vaccine. *N. Engl. J. Med.* 384, 403–416
2. Polack, F.P. *et al.* (2020) Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine. *N. Engl. J. Med.* 383, 2603–2615
3. Sadoff, J. *et al.* (2021) Interim Results of a Phase 1-2a Trial of Ad26.COV2.S Covid-19 Vaccine. *N. Engl. J. Med.* 384, 1824–1835
4. Reiter, P.L. *et al.* (2020) Acceptability of a COVID-19 vaccine among adults in the United States: How many people would get vaccinated? *Vaccine* 38, 6500–6507
5. Daly, M. and Robinson, E. (2020) Willingness to vaccinate against COVID-19 in the US: Longitudinal evidence from a nationally representative sample of adults from April-October 2020. *medRxiv* DOI: 10.1101/2020.11.27.20239970
6. Schaffer DeRoo, S. *et al.* (2020) Planning for a COVID-19 Vaccination Program. *JAMA* 323, 2458–2459
7. Volpp, K.G. and Cannuscio, C.C. (2021) Incentives for Immunity - Strategies for Increasing Covid-19 Vaccine Uptake. *N. Engl. J. Med.* 385, e1
8. Pawelec, G. and Picard, E. (2021) Catch-as-catch-can: mRNA vaccination boosts immune responses to SARS-CoV-2 variants. *Signal Transduct. Target. Ther.* 6, 259
9. Wang, C. *et al.* (2021) SARS-CoV-2 (COVID-19) vaccination in dermatology patients on immunomodulatory and biologic agents: Recommendations from the Australasian Medical Dermatology Group. *Australas. J. Dermatol.* 62, 151–156
10. Lazarus, J.V. *et al.* (2021) A global survey of potential acceptance of a COVID-19 vaccine. *Nat. Med.* 27, 225–228
11. Attwell, K. and Smith, D.T. (2018) Hearts, minds, nudges and shoves: (How) can we mobilise communities for vaccination in a marketised society? *Vaccine* 36, 6506–6508
12. Thomson, A. *et al.* (2018) Strategies to increase vaccine acceptance and uptake: From behavioral insights to context-specific, culturally-appropriate, evidence-based communications and interventions. *Vaccine* 36, 6457–6458
13. Xia, T. *et al.* (2019) Understanding flu vaccination acceptance among U.S. adults: the health belief model and media sources. *ICRCC* 2, 35–37
14. CDC COVID Data Tracker. [https://covid.cdc.gov/covid-data-tracker/#vaccinations\\_vacc-total-admin-rate-total](https://covid.cdc.gov/covid-data-tracker/#vaccinations_vacc-total-admin-rate-total). Accessed September 6, 2021.
15. Al-Amer, R. *et al.* (2021) COVID-19 vaccination intention in the first year of the pandemic: A systematic review. *J. Clin. Nurs.* DOI: 10.1111/jocn.15951
16. Dror, A.A. *et al.* (2020) Vaccine hesitancy: the next challenge in the fight against COVID-19. *Eur J Epidemiol* 35, 775–779
17. Ezeonwu, M.C. (2018) Specialty-care access for community health clinic patients: processes and barriers. *J Multidiscip Healthc* 11, 109–119
18. Biasio, L.R. (2017) Vaccine hesitancy and health literacy. *Hum. Vaccin. Immunother.* 13, 701–702
19. COVID-19 vaccine information. <https://www.aad.org/member/practice/corona-virus/vaccines>. Accessed August 30, 2021.
20. Butt AA, Nafady-Hego H, Chemaitelly H, *et al.* Outcomes Among Patients with Breakthrough SARS-CoV-2 Infection After Vaccination: Breakthrough SARS-CoV-2 infection. *Int J Infect Dis.* August 2021. doi:10.1016/j.ijid.2021.08.008