ELSEVIER

Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

BRIEF NOTES

Perceptions of COVID-19 vaccines in a predominantly Hispanic patient population from the Texas–Mexico border

Collin J. Amundson, PharmD *,
Jeri J. Sias, PharmD, MPH Clinical Professor and Postgraduate Year 1
Community-based Residency Program Director,
Gabriel A. Frietze, PhD Assistant Professor of Instruction

School of Pharmacy, University of Texas at El Paso, El Paso, TX

A R T I C L E   I N F O

A B S T R A C T

Background: Compared with nationwide averages, Hispanic individuals have experienced lower routine vaccination rates and have been disproportionately hospitalized for coronavirus disease 2019 (COVID-19). Few, if any, studies have examined the health beliefs surrounding the COVID-19 vaccines and adult vaccines among this population.

Objectives: This study aimed to (1) describe perceptions of COVID-19 vaccines in a predominantly Hispanic patient population in a federally qualified health center (FQHC) situated on the United States–Mexico border and (2) compare patient confidence in recommendations made by local clinic and government to obtain adult and COVID-19 vaccines.

Methods: A bilingual (English or Spanish) written survey was administered to participants recruited from a convenience sample of patients in waiting areas of 4 clinic sites in an FQHC system on the Texas-Mexico border between March and May 2021. Survey items were derived from the Health Belief Model and captured beliefs surrounding perceived effectiveness, perceived harms, protection from the influenza vaccine, trust in the local clinic, and trust in the government.

Results: A total of 58 participants aged 19-90 years, with a mean age of 57.28 years, completed the survey between March and May 2021, with 77.6% of respondents indicating they would accept a COVID-19 vaccine for themselves. Results revealed a trend among older adults in the study cohort to be more likely to trust the government in recommending vaccines than younger adults ($r = 0.33$, $P \leq 0.05$) and a tendency toward higher vaccine acceptance among male survey participants ($P = 0.026$). The highest correlation that emerged was between perceived trust in local clinic provider and the perceived effectiveness of vaccines ($r = 0.74$, $P < 0.01$).

Conclusion: Trends related to perceptions of adult vaccines among Hispanic patients extend to the COVID-19 vaccines: especially trust in local clinic providers. Increased age may correlate to higher trust in a government-recommended vaccine. Results highlight the importance of the pharmacist giving the patient a clear recommendation to receive vaccination and strong local clinic messaging.

Background

Compared with nationwide averages, Hispanic individuals have experienced lower routine vaccination rates and have been disproportionately hospitalized for coronavirus disease 2019 (COVID-19). To understand the context and scope of lower vaccine rates among Hispanics, in the 2018–2019 influenza season, 37.1% of Hispanic respondents had influenza vaccine coverage compared with the national average of 45%.[1]

Furthermore, in a review of the American Heart Association's COVID-19 registry, Hispanic patients bore a higher burden of morbidity and mortality from COVID-19.[2]

Pharmacists have taken a central role in immunizing adults against COVID-19.[3-5] High vaccine coverage is the keystone to reducing hospitalization, curbing deaths, and relaxing of nonpharmaceutical interventions to prevent disease spread, according to the Centers for Disease Control and Prevention projections.[6] As of July 14, 2021, approximately 55% of the total U.S. population have had at least 1 dose of a vaccine, and 48% of the U.S. population is fully vaccinated.[7] However, for vaccine uptake to reach ideal levels, vaccine messaging must address patient-population perceptions.

The Health Belief Model (HBM) has been widely used in the literature to describe how vaccination knowledge, attitudes, and beliefs affect behavior.[8-10] However, there is no published literature describing perceptions, attitudes, and beliefs of COVID-19 vaccines in a primarily Spanish-speaking population. For vaccination efforts to reach all patients, collecting local beliefs and attitudes is key to adapting outreach.

This study seeks to describe unique trends of perceptions of adult vaccines and COVID-19 vaccines within the framework of the HBM for a predominantly Hispanic population living along the United States–Mexico border. Through further bilingual survey of vaccine perceptions in the Hispanic population, outreach can better be tailored to achieve equity in vaccination rates.

Objectives

The 2 primary objectives for this study were to (1) describe perceptions of COVID-19 vaccines in a predominantly Hispanic patient population in a federally qualified health center (FQHC) situated on the United States–Mexico border and (2) compare patient confidence in recommendations made by local clinic and government to obtain adult and COVID-19 vaccines.

Methods

A written survey was administered to participants recruited from a convenience sample of patients in waiting areas of 4 clinic sites in an FQHC system spanning rural and urban areas of the Texas–Mexico border between March and May 2021. The research team provided information about the project and obtained informed consent in each participants' language of choice. Participants meeting the inclusion criteria (18 years of age or older, able to speak and understand English or Spanish) and conveying interest were asked to volunteer for participation. Although responses were written, participants were offered help verbally in English or Spanish if they had difficulty reading or understanding survey items. Those who volunteered to participate were offered entrance into a raffle to win one of 3 gift certificates valued at < $20 each. The survey was developed in September 2020 before any COVID-19 vaccine was authorized and approved by the institutional review board (IRB) at the associated university on December 16, 2020.

Measures

Survey

The research team reviewed published literature on vaccine acceptance and hesitancy to adapt a survey relevant to the clinic population.[10,11] Survey items were originally developed and simplified in English to include basic demographics and variables related to vaccine acceptance, perceived efficacy, and safety, as well as trust (see Appendix 1). An experienced translator at the university reviewed and edited the survey document for correct Spanish. An initial demographics and background survey assessed age, gender, race, health conditions, and health insurance. Overall, the simple survey was designed to be completed in less than 10 minutes.

Survey questions included assessment of COVID-19 vaccine acceptance for self and for children, motives for not accepting COVID-19 vaccine, and perceived importance of vaccines. To assess variables based on the HBM, 3 items were addressed: perceived effectiveness of vaccines, perceived protection from the influenza vaccine, and perceived harms. Trust in the local clinic and trust in the government were also assessed. Responses were keyed with a 5-point Likert scale, and all responses were reverse coded so that higher scores indicate greater perceived effectiveness, protection, harm, and trust.

Approach to analysis

Means and SDs were examined for continuous variables and percentages for categorical variables. Correlational analyses were used to examine associations between continuous variables. Chi-square tests for independence were originally planned to examine the associations between categorical variables. However, owing to sample size constraints, the violation of minimum cell frequency for the chi-square test for independence was violated. To suit the sample size and data collected, Fisher exact probability test substituted a 2-by-2 chi-square analysis when the minimum cell frequency assumption was violated.

Results

A total of 58 participants (mean age 57.28 years, SD 18.33, range 19–90) were recruited from a Texas–Mexico border community health center clinic. Baseline demographics of survey respondents are included in Table 1. Participants were predominantly Hispanic and female and mostly completed the survey in Spanish. Nearly half of the sample reported to be uninsured. Participants perceived the influenza vaccine to be the most important for their health (81%), followed by the tetanus vaccine (79.3%), the pneumococcal vaccine (70.7%), and the shingles vaccine (58.6%).

Vaccine acceptance

Ten participants (17%) reported that they would not accept the COVID-19 vaccine for themselves if approved in the United States at no cost to the patient, and 4 reported that they would not accept the COVID-19 vaccine for their children if approved in the United States and at no cost Table 1. Fisher exact probability test was used to examine the association between gender and COVID-19 vaccine acceptance and revealed that men were more likely to accept the vaccine in comparison with women (100% vs. 74.4%, respectively; $P = 0.026$). Owing to the limited sample size, chi-square analyses could not examine other associations owing to the violation of the assumption of minimum cell frequency.

Motives for not vaccinating

Motives behind not receiving the COVID-19 vaccine included being worried about adverse effects (n = 6) and feeling it was unsafe (n = 2), and 4 participants reported "other" motives. Motives behind not vaccinating children with the COVID-19 vaccine included being worried about adverse effects (n = 2) and feeling it was unsafe (n = 3), and 1 reported "other" motives.

Trust in the local clinic and trust in government

Several statistically significant correlations emerged as displayed in Table 2. The strongest correlation was between perceived effectiveness of vaccines and trust in the local clinic ($r = 0.74, P < 0.001$). Trust in the local clinic was also associated with perceived protection from the influenza vaccine, perceived harms of vaccines, and trust in the government. The correlation of trust in the government had a statistically significant association with each of the variables. Notably, increasing reported age was positively associated trust in government to administer vaccines, but was not associated with other variables. Perceived harms of vaccines was inversely associated with trust in the local clinic, trust in government, and perceived protection from the influenza vaccine (Tables 1 and 2).

Discussion

Immunization against COVID-19 requires equitable interventions to extend protection to adults most in need. Multiple reports of ranging from 20% to 40% of all adults refusing to vaccinate are emerging in national surveys.[12-15] However, at the time of this writing, there have not been any published Spanish-language surveys about COVID-19 vaccine perceptions in the Hispanic community in the United States. Results from this study signal that previously identified trends in the literature about vaccine confidence for routine vaccines extend to COVID-19 vaccines among Hispanic individuals living in this section of the Texas–Mexico border.

Although the study was IRB approved before the widespread release of COVID-19 vaccine, results collected during initial vaccination phases revealed resistance to vaccination among this sample. Nearly 18% of participants responding that they had no intention to vaccinate with the COVID-19 vaccines. Perceived harms or adverse effects were the primary reasons for not intending to vaccinate. An early poll about vaccine uptake indicated that more Americans would accept COVID-19 vaccines if assured of their safety.[16] When health care providers like pharmacists seek to educate patients about vaccines, assurance of safety is likely a very effective talking point.

Survey results suggested that trust in local providers was strongly related to trust in vaccines. A moderate correlation of $r = 0.74$ in perceived effectiveness of vaccines and trust in the local clinic indicated that messaging from pharmacists, physicians, and other vaccinators was key to patients' willingness to receive the vaccines, despite hesitancy. Strong provider recommendation has been shown in the literature to increase positive perceptions of vaccines and vaccination acceptance.[17] Findings from our survey pointed to similar health behavior among the study population.

Table 1
Demographics and vaccine acceptance (N = 58)

Variable	Total responses	% of responses
Gender		
Female	40	69
Male	18	31
Language		
Spanish	43	74.1
English	15	25.9
Race		
Hispanic or Latino or Latina	56	96.6
Non-Hispanic white	1	1.7
Missing[a]	1	1.7
Arrived to clinic with		
Arrived alone	31	53.4
Son or daughter	12	20.7
Friend	4	6.9
Grandchild	2	3.4
Other	9	15.5
COVID-19 vaccine acceptance for self		
Yes	45	77.6
No	10	17.2
Missing[a]	3	5.2
Parent or guardian of children younger than the age of 18 y		
Yes	15	25.9
No	38	65.5
Missing[a]	5	8.6
COVID-19 vaccine acceptance for children		
Yes	18	31
No	4	6.9
Not applicable (not parent or guardian for child)	36	62.1
Reported insurance status[b]		
Uninsured	24	41.4
Medicare	20	34.5
Medicaid	15	25.9
Private health plan	10	17.2
Do not know	3	5.2

Abbreviation used: COVID-19, coronavirus disease 2019.
[a] Missing refers to missing data. Percentages may not add up to 100% owing to rounding.
[b] Data were collected using a "select all that apply" option; observations add up to more than 100%.

Media coverage and politicization has especially undermined public trust of the COVID-19 vaccines.[15] Many targets of misinformation involve conspiracies involving the government. However, these perceptions are not new. A recent study among a predominantly Hispanic population reveals that greater distrust of government vaccine messaging decreases reported influenza vaccine acceptance.[11] This study reflected the same trend with trust in the government inversely associated with perceived harms, positively associated with confidence in effectiveness in vaccines, and positively associated with benefits of the influenza vaccine.

The cor-relation observed with increasing age and trust in government recommendations of vaccines could be explained by the fact that older generations have seen historical victories that vaccines have had over infectious diseases such as smallpox, polio, and tetanus. Furthermore, older generations may be sheltered from the spread of misinformation through social media and online media sources.

Table 2
Associations among perceived vaccine effectiveness, protection, harms, and trust based on 5-point Likert scale and age reported as a continuous variable (N = 58)

Variable	1. Age[a]	2. Perceived vaccine effectiveness	3. Perceived influenza vaccine protection	4. Perceived harms	5. Trust in the local clinic	6. Trust in the government
1. Age[a]	–	–	–	–	–	–
2. Perceived vaccine effectiveness	0.01	–	–	–	–	–
3. Perceived influenza vaccine protection	0.03	0.56[b]	–	–	–	–
4. Perceived harms	−0.11	−0.20	−0.45[b]	–	–	–
5. Trust in the local clinic	−0.03	0.74[b]	0.67[b]	−0.37[c]	–	–
6. Trust in the government	0.33[c]	0.57[b]	0.71[b]	−0.46[b]	0.71[b]	–
Mean(SD)	57.28 (18.33)	4.55 (.61)	4.5 (.64)	2.96 (1.25)	4.21 (.96)	4.32 (.81)

Note: The variables (1–6) were evaluated with the following survey items, and responses keyed on a 5-point Likert scale: (1) Age (self-reported), (2) Perceived effectiveness of vaccines (*Vaccines work well to prevent infections*), (3) Perceived protection from the influenza vaccine (*Getting a flu vaccine every year is a good way to protect my family from disease*), (4) Perceived harms (*I am worried that vaccines will harm me*), (5) Trust in the local clinic (*If a health care worker at a clinic recommends a vaccine, I will get it*), and (6) Trust in the government (*If the government recommends a vaccine, I will get it*).
[a] Indicates that the correlation is reported using Pearson correlation coefficient (2 tailed). All other correlations were reported using Spearman rho (2 tailed).
[b] $P < 0.01$.
[c] $P < 0.05$.

Gender differences within vaccine uptake confirm previous reports in the literature on COVID-19 perceptions. All published national surveys of attitudes toward potential COVID-19 vaccines and correlations of intentions to vaccinate have consistently shown that male participants are more likely to indicate intentions to vaccinate than female participants.[12-15,18,19] This trend suggests that increased outreach is needed for Hispanic women about the safety and efficacy of COVID-19 vaccines to achieve the key levels of vaccine coverage.

Although survey sampling was done at different clinic locations, times, and days, a convenience sample was used to gather data among an underserved Hispanic population attending clinic visits. The survey offers groundwork for evaluating COVID-19 perceptions in a majority Hispanic community, but the survey items were not validated for internal consistency. Instead, questions were inspired from a validated vaccine hesitancy tool created by Larson et al.[10] in 2015. A widely cited Gallup poll was adapted to Spanish and used in our survey to gauge vaccine acceptance in our clinic population.[20] There was an effect between gender and vaccine uptake; however, these results should be interpreted with caution given the small sample size. Because the chi-squared criteria could not be achieved, conclusions could not be drawn about the expected differences between the variables on vaccine acceptance.

Direct provider recommendation has been consistently shown to be the most effective at increasing vaccine acceptance in the past, even before the COVID-19 pandemic.[17] Language-wise, presumptive language has been shown to specifically be more effective than conventional language for vaccine discussions,[21,22] for example, "after this appointment, we will schedule your COVID-19 vaccine with the nurse or pharmacist" versus "would you like to get the COVID19 shot today?" Although evaluation of presumptive language was outside the scope of the present survey, an area of potential research could examine whether these results could be replicated with COVID-19 vaccines.

This survey constitutes one of the first studies that collected COVID-19 vaccines perceptions among underserved, underinsured Hispanic adults using a bilingual survey structure. Survey structure was a strength, given that many patients from the clinic capture area spoke Spanish. Collecting data via in-person survey administration avoids bias against participants who may not have Internet access or do not regularly respond to phone solicitation. Bias toward selecting for survey participants with only strong provaccine or strong antivaccine opinion, or Neyman's bias, was attenuated in the survey collection period because participants were encouraged to complete a survey about positive and negative opinions of vaccines. Importantly, we acknowledge that the small sample size (N = 58) is a limitation of the current study and may have affected our conclusions. In particular, we were unable to examine factors associated with vaccine acceptance owing to our small sample size and therefore could not contribute to the body of literature regarding the correlates of vaccine acceptance. Another limitation is that we did not compare Hispanics with non-Hispanics; thus, future studies will be needed to determine whether responses differ for non-Hispanics. We also recognize the limitation that our current study collected data using a quantitative survey, which may not capture all the reasons why people are hesitant to get vaccinated; future studies may benefit from including qualitative data elements including an open-ended response to capture the multitude of reasons for being vaccine hesitant. Despite these limitations, several strong correlations have emerged in the results, revealing valuable information about Hispanic individuals' perceptions of adult vaccines.

Conclusion

The results of this study confirm that trends related to perceptions of adult vaccines among Hispanic patients extend to the COVID-19 vaccines. Consistent with other national surveys, there was prevalence of resistance to the vaccines, especially among female survey participants. However, when patients had higher trust in the local clinic, they had less perception of vaccine harm, suggesting clinics and providers can influence vaccine beliefs. Furthermore, increasing age was associated with higher trust of the government in recommending vaccines. Potential solutions include the importance of pharmacist giving the patient a strong recommendation to receive vaccination and local clinic messaging specific to the needs of the community to increase vaccination uptake.

Acknowledgments

References

1. United States Centers for Disease Control and Prevention. Influenza: FluVaxView. Available at: https://www.cdc.gov/flu/fluvaxview/index. htm. Accessed October 7, 2020.

2. Rodriguez F, Solomon N, de Lemos JA, et al. Racial and ethnic differences in presentation and outcomes for patients hospitalized with COVID 19: findings from the American Heart Association's COVID 19 cardiovascular disease registry. *Circulation*. 2021;143(24), 2332−2234.

3. National community Pharmacy Association. NCPA to state and local health officials: give community pharmacists a shot with vaccine rollout. Available at: ncpa.org/newsroom/news-releases/2021/01/14/ncpa-state-and-local-health-officials-give-community-pharmacists. Accessed July 13, 2021.

4. Centers for Disease Control and Prevention. Federal Retail Pharmacy Program for COVID-19 vaccination. Available at: https://www.cdc.gov/vaccines/covid-19/retail-pharmacy-program/index.html. Accessed July 10, 2021.

5. Strand MA, Bratberg J, Eukel H, Hardy M, Williams C. Community pharmacists' contributions to disease management during the COVID-19 pandemic. *Prev Chronic Dis*. 2020;17:E69.

6. Borchering RK, Viboud C, Howerton E, et al. Modeling of future COVID-19 cases, hospitalizations, and deaths, by vaccination rates and nonpharmaceutical intervention scenarios - United States, April-September 2021. *MMWR Morb Mortal Wkly Rep*. 2021;70(19):719−724.

7. Centers for Disease Control and Prevention. COVID data tracker: COVID-19 vaccinations in the United States. Available at: https://covid.cdc.gov/covid-data-tracker/#vaccinations. Accessed July 14, 2021.

8. Carpenter CJ. A meta-analysis of the effectiveness of health belief model variables in predicting behavior. *Health Commun*. 2010;25(8):661−669.

9. Harrison JA, Mullen PD, Green LW. A meta-analysis of studies of the health belief model with adults. *Health Educ Res*. 1992;7(1):107−116.

10. Larson HJ, Jarrett C, Schulz WS, et al. Measuring vaccine hesitancy: the development of a survey tool. *Vaccine*. 2015;33(34):4165−4175.

11. Padilla ME, Frietze G, Shenberger-Trujillo JM, Carrillo M, Loya AM. Influenza and intentions to vaccinate in an underserved Hispanic population: the role of theoretically derived constructs. *J Pharm Pract*. 2020;33(3):326−333.

12. Callaghan T, Moghtaderi A, Lueck JA, et al. Correlates and disparities of intention to vaccinate against COVID-19. *Soc Sci Med*. 2021;272: 113638.

13. Fisher KA, Bloomstone SJ, Walder J, Crawford S, Fouayzi H, Mazor KM. Attitudes toward a potential SARS-CoV-2 vaccine: a survey of U.S. adults. *Ann Intern Med*. 2020;173(12):964−973.

14. Carnegie Mellon University. COVID-19 vaccination hesitancy remains unchanged. Available at: https://www.cmu.edu/dietrich/news/news-stories/2021/march/covidcast-vaccine.html. Accessed June 1, 2021.

15. Ruiz JB, Bell RA. Predictors of intention to vaccinate against COVID-19: results of a nationwide survey. *Vaccine*. 2021;39(7):1080−1086.

16. Bernstein S. Most Americans would take coronavirus vaccine if deemed safe: Reuters/Ipsos poll. Available at: www.reuters.com/article/us-health-coronavirus-usa-poll/most-americans-would-take-coronavirus-vaccine-if-deemed-safe-reuters-ipsos-poll-idUSKBN22I019. Accessed May 6, 2020.

17. Darden PM, Jacobson RM. Impact of a physician recommendation. *Hum Vaccin Immunother*. 2014;10(9):2632−2635.

18. Khubchandani J, Saiki D, Kandiah J. Masks, gloves, and the COVID-19 pandemic: rapid assessment of public behaviours in the United States. *Epidemiologia*. 2020;1(1):16−22.

19. Cordina M, Lauri MA, Lauri J. Attitudes towards COVID-19 vaccination, vaccine hesitancy and intention to take the vaccine. *Pharm Pract (Granada)*. 2021;19(1):2317.

20. O'Keefe SM. One in three Americans would not get COVID-19 vaccine. Available at: https://news.gallup.com/poll/317018/one-three-americans-not-covid-vaccine.aspx. Accessed August 25, 2020.

21. Opel DJ, Heritage J, Taylor JA, et al. The architecture of provider-parent vaccine discussions at health supervision visits. *Pediatrics*. 2013;132(6): 1037−1046.

22. Jacobson RM, St Sauver JL, Griffin JM, MacLaughlin KL, Finney Rutten LJ. How health care providers should address vaccine hesitancy in the clinical setting: evidence for presumptive language in making a strong recommendation. *Hum Vaccin Immunother*. 2020;16(9):2131−2135.

Collin Amundson, PharmD, PGY-1 Community-Based Pharmacy Resident, School of Pharmacy, University of Texas at El Paso, El Paso, TX

Jeri J. Sias, PharmD, MPH, Clinical Professor and PGY-1 Community-Based Residency Program Director, School of Pharmacy, University of Texas at El Paso, El Paso, TX

Gabriel Frietze, PhD, Assistant Professor, Instruction, School of Pharmacy, University of Texas at El Paso, El Paso, TX

Appendix

Appendix 1
Survey items

Survey item	Demographics (Spanish)	Demographics (English)
1.	Edad _____	Age _____
2.	Tengo/padezco de: Cancer, enfermedades de los riñones, Enfermedades de los pulmones, Problemas del sistema inmunológico, Obesidad, Problemas serios del corazón Enfermedad de la célula de Sickle, Diabetes	I have: Cancer [] Kidney disease [] Lung disease Poor immune system []Obesity Serious heart conditions Sickle cell disease []Diabetes
3.	Género: Hombre Mujer [] Otros_____	Gender: Male Female [] Other_____
4.	Seguro de Salud durante los últimos 12 MESES: Medicare, Medicaid, Seguro de Salud Privado No tiene seguro, No sabe	Health Insurance in last <u>12 MONTHS</u>: Medicare []Medicaid []Private Insurance Not insured Don't know
5.	Raza/Etnia (escoja todos los que le apliquen): Hispano/a o Latino/a No-Hispano Caucásico/a o Blanco/a Asiático/a Afroamericano/a o Negro/a Indio Americano/a o Nativo/a de Alaska Raza/Etnia desconocida Otro (escríbalo por favor) _____	Race/Ethnicity (check all that apply): Hispanic or Latino/a Non-Hispanic Caucasian or white Asian African American or black Native American or Alaska Native Race/Ethnicity Unknown Other (write in) _____
6.	¿Con cuáles miembros de su familia vino usted hoy? Abuelo/abuela Padre/padrastro Madre/madrastra Hijo/hija Bisabuelo/bisabuela Tío/tía Hermano/hermana o medio hermano/hermana Amigo/amiga Sobrino/sobrina Primo/prima Nieto/nieta Suegro/suegra Cuñado/cuñada	Which family members did you come with today? Grandparent Parent or step-parent Son or daughter Great-grandparent Uncle or aunt Sibling or step-sibling Friend Niece or nephew Cousin Grandson or granddaughter Father-in-law or mother-in-law Brother-in-law or sister-in-law
	Survey Questions (Spanish)	**Survey Questions (English)**
7.	Si los Estados Unidos de América aprobara una vacuna contra el coronavirus (COVID-19), sin ningún costo para usted, permitiría que lo/la vacunaran? 1. Sí 2. No	If the United States approved a vaccine against coronavirus (COVID-19) at no cost to you, would you get vaccinated? 1. Yes 2. No
8.	Si usted contestó que <u>NO</u> a la <u>PREGUNTA 7</u>, <u>POR QUÉ</u> no permitiría que lo/la vacunaran contra el COVID-19? 1. Porque creo que no funcionará 2. Porque me preocupan los efectos secundarios 3. Porque creo que es insegura 4. Porque es muy cara 5. Otro motivo (por favor explíquelo) _____	If you answered <u>NO</u> to QUESTION 7, WHY would you not get a COVID-19 vaccine? 1. I feel it will not work 2. I am worried about the side effects 3. I feel it is unsafe 4. Too expensive 5. Other (please explain)_____
9.	¿Es usted el padre o tutor de niños o adolescentes menores de 18 años? 1. SÍ 2. No	Are you a parent or guardian of children under the age of 18? 1. Yes 2. No
10.	Si usted contestó que <u>SÍ</u> a la <u>PREGUNTA 9</u>, o sea, si los Estados Unidos de América aprobara una vacuna contra el coronavirus (COVID-19), sin ningún costo para usted, ¿aceptaría que sus hijos se vacunaran? 1. SÍ 2. No	If you answered <u>YES</u> to <u>QUESTION 9</u>, if the United States approved a vaccine against coronavirus (COVID-19) at no cost to you, would you agree for your children to be vaccinated? 1. Yes 2. No
11.	Si usted contestó que <u>NO</u> a la <u>PREGUNTA 10</u>, ¿<u>POR QUÉ</u> no aceptaría que se vacunaran sus hijos con la vacuna del COVID-19? 1. Porque pienso que no funcionará 2. Porque me preocupan los efectos secundarios que podría tener esta vacuna. 3. Porque pienso que es insegura 4. Porque es muy cara 5. Otros motivos_____	If you answered <u>NO</u> to <u>QUESTION 10</u>, WHY would you NOT agree for your children to get the COVID-19 vaccine? 1. I feel it will not work 2. I am worried about the side effects 3. I feel it is unsafe 4. Too expensive 5. Other_____
12.	Pienso que las vacunas son muy buenas para prevenir las infecciones. 1. Totalmente de acuerdo 2. De acuerdo 3. No lo sé 4. Estoy en Desacuerdo 5. Totalmente en desacuerdo	Vaccines work well to prevent infections. 1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree

Perceptions of COVID-19 vaccines among a population from the Texas-Mexico border

Appendix 1 (*continued*)

Survey item	Demographics (Spanish)	Demographics (English)
13.	¿Cuáles de las siguientes vacunas son importantes para su salud? (Marque todas las que usted crea que son importantes) 1. Influenza/gripe cada año 2. Tétanos cada 10 años 3. Herpes Zoster después de los 50 años 4. Neumonía (debida a neumococos) 5. No sé 6. Yo no creo que las vacunas sean importantes para los adultos	Which of the following vaccines are important for my health? (Check all that apply) 1. Influenza/flu every year 2. Tetanus every 10 years 3. Shingles/Zoster after age 50 4. Pneumonia (pneumococcal) vaccine 5. I don't know 6. I do not think vaccines are important for adults
14.	Ponerse la vacuna contra la influenza cada año es una buena forma de proteger a mi familia de la enfermedad. 1. Totalmente de acuerdo 2. De acuerdo 3. No lo sé 4. Estoy en Desacuerdo 5.Totalmente en desacuerdo	Getting a flu vaccine every year is a good way to protect my family from disease. 1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree
15.	Si un profesional de la medicina en la Clínica La Fe me recomienda una vacuna, me la voy a aplicar. 1. Totalmente de acuerdo 2. De acuerdo 3. No lo sé 4. Estoy en Desacuerdo 5. Totalmente en desacuerdo	If a health care worker at La Fe recommends a vaccine, I will get it. 1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree
16.	Me preocupa que las vacunas puedan causarme un daño. 1. Totalmente de acuerdo 2. De acuerdo 3. No lo sé 4. Estoy en Desacuerdo 5. Totalmente en desacuerdo	I am worried that vaccines will harm me. 1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree
17.	Si el gobierno recomienda una vacuna, me la voy a aplicar. 1. Totalmente de acuerdo 2. De acuerdo 3. No lo sé 4. Estoy en Desacuerdo 5. Totalmente en desacuerdo	If the government recommends a vaccine, I will get it. 1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree

Abbreviation used: COVID-19, coronavirus disease 2019.
Note: The original surveys in English and Spanish were 3 and 4 pages in length, respectively, one sided, black and white, 15-point sans serif font, with space between items. Signifies a checkbox.
Perceptions of COVID-19 vaccines in a predominantly Hispanic patient population from the Texas-Mexico border