



Diné Teachings and Public Health Students Informing Peers and Relatives about Vaccine Education (RAVE)

Navajo NARCH: Student Evaluation of the Student Enhancement Program

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Background

American Indian/Alaska Native (AI/AN) populations have been negatively impacted by the COVID-19 pandemic due to racial inequity, historical trauma, and health disparities resulting in an incidence of positive COVID-19 cases 3.5 times that of non-Hispanic whites.¹ The Navajo Nation (NN) has the largest tribal enrollment at 332,129 and is largest Native American reservation in the United States (US), spanning across parts of Arizona, New Mexico, Utah and Colorado; where over 173,000 of enrolled citizens (Diné people) reside.^{2,3,4} In May 2020, the NN had surpassed both New York and New Jersey for the highest per-capita COVID-19 infection rate in the United States (US) with 2,304 positive cases per 100,000 residents while the overall US rate was 636 positive cases per 100,000 residents.⁵ The increase in COVID-19 cases, and ultimately the highest rate of COVID-19 related mortality, is attributed to NN residents living in multigenerational homes, having limited access to running water and resources, and lacking social trust in external social systems.^{5,6,7} Although more NN residents were fully vaccinated at 37.4%, compared to 19.9% in the US adult population at the same time period, vaccine hesitancy still might be preventing NN residents from receiving the vaccine.^{5,8,9}

To influence health behavior intention on the NN, the Diné Teachings and Public Health Students Informing Peers and Relatives about Vaccine Education (RAVE), was designed to integrate trust and culture to address adults' vaccine concerns and hesitancy. RAVE's objective was to increase NN adult residents' knowledge of the COVID-19 vaccines to encourage vaccination uptake. RAVE conducted interviews with Diné Traditional Knowledge Holders (TKHs) to integrate cultural teachings into educational tools. Once trained in a classroom setting, Diné College public health students delivered vaccine education to their peers and family members by relying on their social and cultural obligation through K'é; a core cultural teaching referring to descent, clanship, and kinship, that will inform and contribute to the relevance of necessary information.^{7,8}

Purpose: Train Diné College public health students to deliver culturally centered, scientifically accurate, vaccine safety information using Diné specific relationality and etiquette to talk to peers and relatives who self-identified as vaccine hesitant.



Methods

PUH 299: Special Topics Course - RAVE

In December 2021, 16 Diné College public health students participated in a one-credit course to be trained as health messengers to deliver the Diné-specific COVID-19 health education materials to unvaccinated adults in their social networks, e.g., friends and family. The course was taught by a faculty member at Diné College along with a graduate teaching assistant from NAU. The 16-week course was an online class, meeting one-hour, weekly through Zoom. Once trained, students were asked to recruit up to 5 peers and relatives who had not received the COVID-19 vaccine. Each health messenger session included informed consent, review of the health education materials, review of an age-range specific digital story, and a 16-element retrospective pretest for participants to complete once the session is completed.

Health Education Materials

The research team drew on COVID-19 vaccine materials developed in a previous collaboration with non-Navajo tribal communities. Diné TKHs were interviewed to develop and incorporate Diné-specific information on individual and collective health behaviors into the RAVE materials. The RAVE research team identified themes using the Hozho Resilience Model and included TKH perspectives into the materials. In addition, adaptations were informed by materials developed by the Johns Hopkins Center for American Indian Health and the Navajo Department of Health (NDOH).

Consensus Panel

The drafted health education materials were presented to two community health representatives (CHRs) and 16 Diné public health students in a consensus panel. This panel considered three criteria: language and content, format and organization, and imagery and colors. With these reviews, the materials were finalized.

Assessment: Retrospective Pretest of Health Messaging

The assessment asked participants to assess their view after the health messaging session then recall their views prior to the intervention, thus allowing assessment of change in knowledge and concerns. The retrospective pretest design was guided by the Theory of Planned Behavior (TPB) and assessed attitudes, perceived behavioral control, subjective norms, and vaccination intention. Chi-square tests assessed significance of changes in quantitative results.

Results

PUH 299 Course Topics	
Week 1	Course introduction CITI Training
Week 2	RAVE Online Community Survey Results
Week 3	Theory of Planned Behavior & Retrospective Pretest
Week 4	Developing Health Messaging Materials
Week 5	Coursera: COVID Vaccine Ambassador Training: How to Talk to Parents
Week 6	COVID-19 and Vaccines – Center for Risk Communication
Week 7	Motivational Interviewing
Week 8	Informed Consent and Recruitment for RAVE Project
Week 9	Review Draft of Health Messaging Materials Process of Creating a Podcast Episode (Alternative Assignment)
Week 10	Consensus Panel for Health Messaging Materials
Week 11	Review Guidelines for Health Message Delivery
Week 12 - 15	Recruit and Deliver Health Message Sessions or Work on Alternative Assignments
Week 16	Reflection of Health Messenger Sessions, Alternative Assignments, and of the Overall Course

Traditional Knowledge Holders perspectives: Themes identified using the Hozho Resilience Model

Parent theme	Definition	Sub-themes	Quotes
Harmony	Remain positive in thought, thinking, balance, harmony with living things, reciprocity	Establish good relationship with COVID-19; continue cultural practices	“He said again also, one should not cuss at it; one should not say things to it, for it lives.” (Male) “Learn your cultural values. Culturally reconstruct yourself with your language. Rebuild yourself... Reclaim your mind...” (Male)
Respect	Remain respectful in all actions by having self-discipline	Self care and healing oneself	“One takes care of self with things wherever one goes. If one does not follow it one’s body is not strong and not enduring” (Male) “Protection prayers and small ceremonies, we continued that.” (Male)
Spirituality	Remain positive and harmonious through prayer	Sweat is effective; traditional medicine knowledge; prayers and offerings were given by medicine men	“Those were some of the herbal medicine and herbal remedies that would stabilize one’s condition or that would alleviate discomfort as they were experiencing symptoms of COVID-19.” (Male) “We did an offering up there. When you do that for humanity, for mankind, and womenkind. You go up there, you do an offering, you say a prayer.” (Male)
COVID-19 Knowledge	TKH knowledge of COVID-19	Medicine men identified COVID-19; Diné history of illness	“Through Diné cultural concept, we always refer to something that is intrusive as Nayee.” (Male) “When they killed the Yei tsoh and when they were taking its head, it spoke to them and said I shall return sometime in the future as an illness.” (Male)
COVID-19 Vaccine	TKH perception of COVID-19 vaccines and vaccination	Supporting vaccination; history of vaccines	“In those pandemics and epidemics in those times, occurrences, Indian Health Services and Public Health Services, medicine, and vaccine, they were made.” (Male) “So, for me, when it as first made for us in January, we were vaccinated. I will set the example I said because it is medicine.” (Male)

COVID-19 Frequently Asked Questions

Traditional Knowledge of COVID-19

Traditional Navajo Knowledge of COVID-19

What is COVID-19 from a traditional viewpoint?

- It is named Dikos Ntsaigil-19 (COVID-19)
- COVID-19 is a *Nayéé* (monster) because it is something that is foreign to the Navajo people.
- It is intrusive to our mind, body, soul, and spirit.

How is COVID-19 related to our Navajo origin stories?

- When the Yei Tsoh was killed, it spoke to the twin warriors and said I shall return in the future as an illness. In our ceremony, we refer to this illness as an invisible spirit to inflict pain upon the Navajo. Sickness like COVID-19 will come upon us to remind us of certain things that we are not doing right such as forgetting our traditional way of life.

What is our relationship with COVID-19?

- We must see COVID-19 as a living thing and respect it.
- One should not cuss at it or say bad things to it, for it lives.
- It thinks furiously and it is very wise. This illness spreads and makes us sick.

COVID-19 Frequently Asked Questions

COVID-19 Vaccine Frequently Asked Questions (FAQ)

FAQ: Will the vaccine give me COVID-19?
No. The vaccine does not contain the virus. It makes a protein like the one found in COVID-19. Our body sees this protein and builds antibodies to protect us. The vaccines are effective at preventing severe illness from COVID-19 and its variants.

FAQ: How long until the vaccine works? How long will it last?
 It takes **two weeks** after your second dose of the Pfizer or Moderna vaccine, or the single dose for the Johnson & Johnson vaccine, to build protection against the virus and be fully vaccinated. We don't know how long protection lasts for those who are vaccinated, but we do know that getting the COVID-19 vaccine is a safer choice than not getting it.

FAQ: Do I need to wear a mask and physically distance after being vaccinated?
Yes. Continue wearing a mask and physically distancing when indoors and at crowded outdoor spaces. Some public places require by laws, rules, and regulations, including local business and workplace guidelines.

FAQ: Does the vaccine protect against variants of the virus, like the Omicron variant?
Yes. Infections happen to a small proportion of people who are vaccinated, even with the Omicron variant. In rare cases, people who are vaccinated can still get the virus. Fully vaccinated people who are infected with the Omicron variant can still spread the virus to others.

FAQ: Who can get vaccinated?
Everyone 12 years and older can get a COVID-19 vaccine to help protect against COVID-19. Pfizer is available to children 5 and older. The vaccine is safe for people with chronic or underlying medical conditions and who are at an increased risk for severe illness from COVID-19.

FAQ: Where can I get an at-home COVID-19 test?
 COVID-19 tests are easily available to the community, from your **local retail stores, local health department, or from the U.S. government.** Your home can get up to 4 free COVID-19 test kits through the mail. Please visit [covidtests.gov](https://www.cdc.gov/covid19-test-kits) to order yours!

FAQ: Can I get a COVID-19 vaccine if I am pregnant? What if I am breastfeeding? What if I want to get pregnant in the future?
Yes. Vaccination is recommended for people who are pregnant, breastfeeding, and trying to get pregnant now or in the future. Pregnant and recently pregnant people are more likely to get severely ill with COVID-19 compared to non-pregnant people, and getting a vaccine can protect you from severe illness.

Results

Retrospective Pretest Results

Student health messengers delivered vaccine education to 46 participants either in-person or via Zoom.¹⁰ Possible answers in the retrospective pretest used either binary scale, “A Great Deal/Not at All,” or one of two four-point, scales: “Strongly Agree” to “Strongly Disagree” or “Very Likely” to “Very Unlikely.” Questions with four possible answers were collapsed to binary outcome for analysis. No demographics were collected. All responses demonstrated change in the desired direction.

Four of the nine attitude questions and two of the three intent questions showed a statistically-significant change. Statistically-significant changes occurred in believing getting the Covid-19 vaccine was a good idea (56.5%), believing the vaccine would prevent Covid-19 (66.3%), believing the vaccines would protect the community (53.3%), and believing research conducted on the vaccines was insufficient (-22.5%). Willingness to consider getting the Covid-19 vaccine (42.9%) and intent to try to get the vaccine (77.3%) both significantly increased.

Attitudes	Pretest	Post %	Change	p-value
Getting vaccinated for COVID-19 is a good idea.	44.44%	69.57%	56.50%	0.013
COVID-19 vaccines will work in preventing COVID-19.	36.36%	60.47%	66.30%	0.021
If I get the vaccines, I will be less likely to get COVID-19.	26.67%	34.09%	27.80%	0.298
COVID-19 vaccines protect the health of my community.	47.83%	73.33%	53.30%	0.011
Concerns about whether COVID-19 vaccines are safe.	86.96%	82.61%	-5.00%	0.386
Not enough research done on COVID-19 vaccines.	86.96%	67.39%	-22.50%	0.023
Concerns about possible side effects of COVID-19 vaccines.	84.78%	78.26%	-7.69%	0.296
Transportation is a barrier (not sure I can get a ride) to a place where I can get the vaccine.	18.18%	15.22%	-16.30%	0.462
Not sure where to go to get the vaccine.	22.22%	11.11%	-50.00%	0.129
Perceived Behavioral Control				
It will be easy for me to get the vaccines to protect myself from COVID-19.	60.87%	76.09%	25.00%	0.089
Subjective Norms				
Most people who are like me will get vaccinated for COVID-19.	46.67%	63.64%	36.40%	0.081
Most people who are important to me will get vaccinated for COVID-19.	69.57%	84.78%	21.90%	0.068
Most people who are important to me think that I should get COVID-19 vaccines.	73.91%	84.78%	14.70%	0.152
Intention to Receive C-19 Vaccine				
Consider getting COVID-19 vaccines?	45.65%	65.22%	42.90%	0.046
Try to get COVID-19 vaccines?	35.56%	63.04%	77.30%	0.008
Actually get vaccinated for COVID-19?	42.22%	56.52%	33.90%	0.124

Conclusion

- Students trained as health messengers are effective in changing attitudes and intents surrounding vaccination status in individuals with whom they are familiar.
- Students were able to leverage their relationships, K'é, to connect with hard-to-reach individuals.
- RAVE suggests students are an underutilized public health resource in Indigenous communities and perhaps in other underserved communities striving toward health equity

References

- Center for Disease Control and Prevention. CDC data show disproportionate COVID-19 impact in American Indian/Alaska Native populations (2020). <https://www.cdc.gov/media/releases/2020/p0819-covid-19-impact-american-indian-alaska-native.html>
- Navajo Epidemiology Center. Navajo Population Profile: 2010 U.S. Census. (2013). <https://nec.navajo-nsn.gov/Portals/0/Reports/NN2010PopulationProfile.pdf>
- Wang, H. Why the Navajo Nation was hit so hard by the coronavirus: Understanding the disproportionate impact of the COVID-19 pandemic. Appl. Geol (2021) 134, 1-10. <https://doi.org/10.1016/j.apgeog.2021.102526>
- Smithsonian National Museum of the American Indian. Navajo Nation: Land purchase (2019). <https://americanindian.si.edu/nk360/navajo/land-purchase/land-purchase.cshml> [Accessed August 18, 2022].
- CNN. Navajo Nation surpasses New York state for the highest Covid-19 infection rate in the US (2020). <https://www.cnn.com/2020/05/18/us/navajo-nation-infection-rate-trnd> [Accessed August 4, 2022].
- Centers for Disease Control and Prevention. Covid-19 in racial and ethnic minority groups (2020). <https://stacks.cdc.gov/view/cdc/89820> [Accessed August 5, 2022].
- Omer, SB, Yildirim, I, & Forman, HP. Herd immunity and implications for SARS-CoV-2 control. JAMA (2020) 324:20.
- Navajo Times. (2021). Coronavirus. <https://navajotimes.com/coronavirus-updates/covid-19-across-the-navajo-nation/> [Accessed April 19, 2021].
- Navajo Department of Health. (2021). Navajo Nation COVID-19 Dashboard. <https://www.ndoh.navajo-nsn.gov/COVID-19/Data> [Accessed April 19, 2021].

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