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Evaluation of a Medical Student Workshop on Confronting Vaccine Hesitancy: A Mixed Methods Approach

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Abstract

Background and Objectives: Undergraduate medical education provides limited formal training on vaccine hesitancy. This study evaluated a student-led workshop for third-year medical students on vaccine hesitancy, emphasizing historical mistrust in Black, indigenous, and people of color (BIPOC) communities and strategies to build confidence in addressing it.

Methods: During a family medicine clerkship rotation, 158 students completed a 90-minute workshop on vaccine hesitancy. The session addressed systemic racism and introduced three evidence-based communication tools, followed by role-play practice. At the end of the clerkship, semistructured focus groups explored the intervention's impact on participants' approaches to vaccine hesitancy. Students also completed pre- and postworkshop surveys to assess attitudes, confidence, and skills regarding vaccine hesitancy.

Results: Focus group analysis revealed five major themes: (1) variability in formal education addressing vaccine hesitancy; (2) the workshop's positive impact on students' skills, knowledge and confidence surrounding vaccine hesitancy; (3) opportunities to improve vaccine hesitancy education; (4) barriers to vaccine acceptance and administration; and (5) the value of student-led workshops and peer learning. Survey results demonstrated a statistically significant increase in students self-reported confidence in the ability to influence vaccine-hesitant individuals, educate patients on vaccination benefits, communicate effectively with hesitant patients, and dispel common vaccine myths (P<.001).

Conclusion: Medical students receive limited formal education in vaccine hesitancy. Preliminary results suggest that this student-led workshop effectively increased students' confidence in addressing vaccine-hesitant patients and their awareness of vaccine hesitancy in BIPOC and other minority communities. Other institutions could adapt similar curricula for health professional students, trainees, or clinicians.

Introduction

Vaccine communication training is not standardized in medical school curricula, leaving gaps in counseling skills. One study found that when confronted with COVID-19 vaccine misinformation, 89.0% of medical

students (n=202) would avoid conflict, while only 9.3% (n=21) would correct it.[1] Another study reported that only 40% of 214 medical students felt knowledgeable about the human papillomavirus (HPV) vaccine and comfortable counseling patients about it.[2]

Racial and ethnic minority populations—particularly Black populations—consistently show lower vaccination uptake than White populations.[3-5] African American patients have reported greater barriers to vaccination, higher influenza-specific hesitancy, stronger endorsement of conspiracy beliefs, and preference for natural alternatives compared to White patients.[6] Trust building is critical for addressing vaccine hesitancy in Black, indigenous, and people of color (BIPOC) communities. In standardized patient encounters, residents perceived as more trustworthy scored higher on clinical and vaccine hesitancy (VH) communication measures.[7]

Vaccine hesitancy curricula can improve trainee skills. A pediatric residency program addressing vaccine misconceptions, communication strategies, and role-playing increased self-reported knowledge and comfort.[8] Similarly, training third- and fourth-year medical students on COVID-19 vaccine counseling using using the "ask-respond-tell-seek" framework and motivational interviewing techniques increased confidence and comfort.[9] This workshop aimed to strengthen medical students' confidence in addressing VH, with a focus on mistrust in BIPOC communities. We hypothesized that students would report increased use of evidence-based communication tools and, secondarily, increased confidence in addressing VH.

Methods

Workshop Design and Implementation

The 90-minute student-led workshop addressed factors influencing vaccine uptake, including the role of systemic racism in vaccine hesitancy among communities of color. Conducted during the family medicine clerkship orientation at an urban private medical school with eight cohorts of third-year students (N=158) from May 2023-2024, student facilitators introduced three evidence-based tools: presumptive language, motivational interviewing, and persistence. Presumptive language presents vaccination as expected[10]; motivational interviewing uses a collaborative, patient-centered approach to explore ambivalence[11]; and persistence involves respectful, continued recommendation.[12.] We focused on influenza, COVID-19, and human papillomavirus (HPV) vaccines for role plays, as these are commonly encountered during the clerkship.

Data Collection and Analysis

Three 30-minute focus groups at the end of the clerkship explored the workshop's impact on VH, including prior experiences, confidence, and use of tools in addressing VH. No attending physicians or administrators participated; 44 of the invited students attended. Sessions were audio-recorded, deidentified, and analyzed by four authors to reach thematic consensus, using content analysis that included inductive and deductive approaches.

To supplement the primary analysis, we conducted pre- and postworkshop Qualtrics surveys. Survey questions were adapted from validated instruments and reviewed for content validity.[13-14] We analyzed matched pre-and postsurvey responses with SPSS-29 software (IBM Corp) and paired *t* tests. Participation was voluntary and did not affect clerkship grades. The study was deemed exempt from review by the Thomas Jefferson University Institutional Review Board.

Results

Focus Group Results

Table 1 lists participant demographics. Five themes emerged, with representative quotes in Table 2.

Theme 1: There is variability in formal education for students on addressing VH.

Most students reported little to no formal training on VH, aside from a single preclinical lecture. Limited experience was gained during pediatric and obstetrics and gynecology rotations.

Theme 2: The workshop positively impacted students' skills, knowledge, and confidence surrounding VH.

Students valued the workshop's focus on medical mistrust and misrepresentation of BIPOC communities in research, and they reported increased willingness to discuss vaccinations, explore reasons for hesitancy, and apply workshop tools.

Theme 3: There are opportunities for improvement in VH education.

Students requested additional content on shingles, pneumonia, and respiratory syncytial virus vaccines, insurance coverage, and more interactive practice.

Theme 4: Participants identified barriers to vaccine acceptance and administration.

Identified barriers included insurance coverage, vaccine availability, time constraints, fear of side effects, limited understanding of the vaccine purpose, and prior negative experiences.

Theme 5: Student-led workshop and peer learning are valuable.

Participants valued the relaxed learning environment and empowerment fostered by student-led instruction.

Supplemental Survey Results

One hundred twelve students (71%) completed matched pre- and postworkshop surveys. Postsession scores increased significantly for eight of 11 items (Figure 1), including self-reported confidence in influencing vaccine-hesitant individuals, educating patients, communicating effectively, and dispelling myths (*P<.001*). Agreement that "some communities are justified in being vaccine hesitant" also increased (*P*<.001).

Discussion

Our workshop addressed medical mistrust among BIPOC communities by framing vaccine disparities within the history of systemic racism in medicine and emphasizing trust-building. In Strully's study,[7] residents perceived as trustworthy scored higher on clinical and communication measures with standardized patients, with patient trust strongly influenced by education- and counseling-focused behaviors. In contrast, less effective residents were described as overly directive and unable to instill confidence.[7] Our qualitative feedback provided insight into the workshop's impact on students' increased willingness to explore underlying reasons for VH, provide VH education within the context of historical racism, and apply these communication tools with vaccine-hesitant patients. Our quantitative survey data reinforce these findings and showed increased self-reported confidence and comfort in addressing VH. This suggests that structured educational programs may increase students' confidence in engaging vaccine-hesitant patients and underscores the importance of prioritizing trust-building communication to counter health care discrimination.

Increasing medical students' comfort and confidence in addressing vaccine hesitancy is critical for effective patient communication. When students feel prepared to engage in respectful, evidence-based conversations, they are more likely to listen actively, acknowledge concerns, and provide clear information without appearing dismissive. These behaviors are particularly important in BIPOC communities, where historical and systemic inequities have contributed to medical mistrust. Equipping future physicians with these skills may reduce vaccination barriers and strengthen patient-clinician relationships.

Students identified areas for improvement for future curricular development, with requests for additional

vaccine-specific content, insurance coverage considerations, and more practice. The workshop's interactive format—including role-playing—provided authentic practice, a strategy supported by prior studies.[8,15] Participants also identified barriers to vaccine uptake and patient concerns about side effects, both of which reflect challenges in clinical practice. Addressing VH education in isolation may be insufficient without also preparing students to navigate these system-level barriers.

This single-institution study was limited by underrepresentation of Black and Latinx students relative to national averages and reliance on self-assessment measures, though findings were supported by qualitative feedback. Future research should incorporate objective, standardized clinical examinations and clinical outcome measures.

In conclusion, a student-led workshop improved students' confidence, comfort, and application of communication tools in addressing vaccine hesitancy, an area of limited formal training. Integrating structured, interactive curricula that acknowledge historical mistrust may strengthen vaccine communication and reduce barriers to vaccination in marginalized communities.

Tables and Figures

Table 1. Demographic Characteristics of Participants

	Survey respondents (n = 112)	Focus group (n = 44)
Age in years, mean (SD)	25.3 (2.3)	25.0 (2.0)
Gender identity		
Cisgender men	48 (42.9%)	22 (50.0%)
Cisgender women	62 (55.4%)	22 (50.0%)
Nonbinary/gender queer	1 (0.9%)	0
Transgender man	1 (0.9%)	0
Race		
White or Caucasian	51 (45.5%)	22 (50.0%)
Asian	39 (34.8%)	18 (41.0%)
Black or African American	5 (4.5%)	2 (4.5%)
Middle Eastern	5 (4.5%)	0
Other/unknown	12 (10.7%)	2 (4.5%)

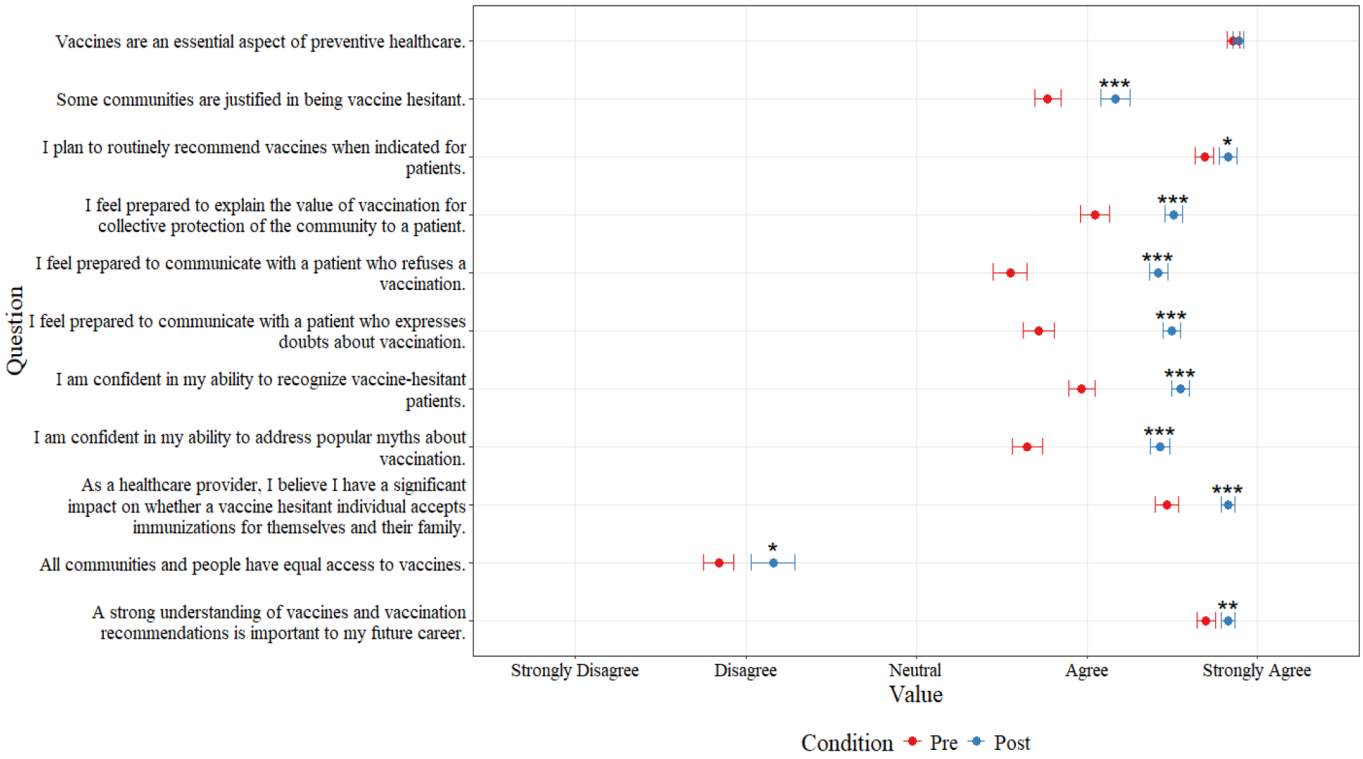
Table 2. Themes and Representative Quotes From a Medical Student Workshop on Addressing Vaccine Hesitancy

Theme 1: There is variability in formal education that teaches students how to address vaccine hesitancy (VH).	
Subtheme	**Representative Quotes**
No prior formal education on addressing VH	"So this was actually ... my first time getting ... a talk or something structured about vaccines." [on prior VH education] "It was not structured for me. It was more just like I was in the outpatient clinic and we would talk about it."
Exposure to VH education on pediatrics and OB/ GYN clerkships	We learned about it [VH] and we learned about it on [Peds rotation] because that's when most of the vaccines are done. [on VH in pediatric clerkship] It was not structured for me. It was more just like I was in the outpatient clinic, and we would talk about it. I might have just completely forgotten it, but I didn't do my [pediatric rotations here. I did it up in Morristown in New Jersey and during my pediatrics rotation there, we didn't really have any structured talks about vaccines or vaccine hesitancy. The moms were just like, give me whatever I need to keep my baby safe. They may not get the flu shot when they're not pregnant, but now they're like, I will get it.
Theme 2: The workshop had a positive impact on students' skills, knowledge, and confidence surrounding VH.	
Increase in student confidence in talking to patients about VH	Because maybe, like, before the workshop, I was less likely to... push back against patients... afterwards, I always ask. Like, why, ... then the patient would have to think for a second about why they actually were hesitant. So I think it was helpful to then open up the conversation. I think prior to the workshop, I myself was also like, in the beginning of the rotation, so I think the patients could also feel my hesitancy to ask them about the vaccines. So then that made them like, less confident in me like, when I counseled them ...
Application of specific tools from the workshop, including presumptive language, motivational interviewing, and narrative medicine to address VH	Yeah. I thought like building the rapport and then using presumptive language [was] a more powerful tool than just like coming in with it. I definitely find myself using the presumptive language more often and thought it was helpful. For me, someone had talked about the flu vaccine. So I didn't say, oh, you might get the flu vaccine. And yeah, [you] might get a little sore one day. The symptoms subside and [you gain] protection. So I recommend it, so I guess more of a personal experience... That's what narrative medicine [is]
Appreciation for workshop addressing mistrust in medical care and misrepresentation of BIPOC communities in research	I think just continuing to increase that education, increase that visibility, because in the end, like, you know, you look at Philadelphia, it's a profoundly black city, so how are we expected to serve it? Especially if you don't come from, you know, have family experiences or share experiences in that community. What still surprises me is what we talked about with like the HPV research and like the types that were researched and they were predominantly in white women, so then top types that were more common in women of other races were being left out, and so they had higher rates of cervical cancer and all these things, so it's like that relationship of the research that ties into a lot of things, but certainly vaccines

Table 2, Continued

Theme 3: There are opportunities for improvement in VH education.	
More specific information on other common and newer vaccines for the workshop	I think, like, two things that could be helpful to add, maybe, to the workshop that I was asked by patients. One patient wanted to know, like, the year that the pneumococcal vaccine came out... Has something been around for like a decade, two decades, like being able to answer those questions as, or just like in your toolbox of like convincing a patient. I'd say for future direction, like next year talking about the RSV vaccine might be interesting because it's new. I think it would be good if you like made it more challenging vaccines, like flu shot is a little easy.
More formal education in the medical school curriculum on vaccines such as the impact of insurance	We don't get a lot of education [on] insurance stuff. Um, like they give us like the gist and the basics of like how insurance works, but like, I don't really know like, um, what the cost is [for any screening or vaccine] To be honest, I don't think that any medical education does that well until you're like practicing, but I think it's something we could include in our curriculum, at least for vaccines. So I think you kind of learn on your own with like third party resources for like your exams and what not, but it would have been nice to kind of maybe like have a lecture."
Improvements for the clinic workflow to address VH	I think that was one of the things that I missed about our clinic [previous rotation site] was when I was there, we'd just have a giant wall, like full of like all, the information packets [that] were different, like based on the age of the patient of like what to give parents if they want more information and that kind of stuff. Also just knowing that the patient population here is very diverse. So we have those packets also in like, like languages that are most followed by that population up there. So that can be like Haitian Creole, you know, Spanish, all that kind of stuff, which I thought was very useful. And I think, like, the M. A. will bring it [vaccines] up. But then, like, I've had some patients, like, Oh, the M. A. said I don't need it. Like, so then it can be hard when they're hearing everything... [they] should probably get training on this too
Theme 4: Participants identified barriers to vaccine acceptance and administration.	
Logistical barriers that affect vaccine administration in the clinic.	My thing in terms of just being cognizant of barriers, like depending on your insurance, even though they did have the Zoster vaccine, they couldn't give it to patients. They didn't have COVID [vaccine in clinic]. So it was just documenting like the patient will get, and then putting it in their like, discharge ... after visit summary. But then it's still on them to go, which then like, less likely for them to do that.
Patient-related barriers to vaccines	That was like another thing about the HPV vaccine. And then the most frustrating thing that it's hard sometimes to dissuade people is because [they believe] HPV is a sexually transmitted infection. They're like, well, my kid doesn't need that because we're not sexually active. And I'm like, this is just, we don't know when your child will become sexually active, so we do this before that could most likely happen, so that when that does happen, they won't like contract [hpv]. For example, I had this lady who didn't know she had COVID, just got over it like a few days ago, and she didn't know she should wait for three months to get the vaccine. She thought she had to wait three months. But then, we went home to CDC website together ... So like, I think that was like really helpful for her to know. Side effects. And then with the shingles, like a lot of patients didn't want to come back for the second one. So there was a conversation like, do I have to like, get it somewhere else
Provider barriers to vaccine administration	I think a lot of physicians, because they're in such a rush, especially on FM, in terms of patients, you forget to ask about these things. And I made it a habit when I'm seeing a patient to check on Epic what screens they need, which a lot of times forget. ... Yeah, I think it is helpful, something we can do, and it's small, but also important. My attending didn't really have the time to go for that... Every patient was so much more complex.... there's like four things to address on the list already. It's like, if vaccine is there, like health care, do you want this? And they say, no, it's just like move on immediately.
Theme 5: Student-led workshop and peer learning are valuable.	
Student-led workshop created a relaxed, open environment for learning	I like the student ones [workshops]. Where they're more chill and [we can] ask questions more freely. I think it just made it a little bit more... like, open ended, kind of, like, sit down. A lot more relaxed. I think the role play was nice as a student led one. Because you could be a little low key about it, a little funny, too, but also still taking it seriously and thinking about these concepts.
Feeling of student empowerment in their ability to influence vaccine decisions	I feel like it was nice that you were like, you guys [MS4 moderators] are like [further] along in the year and you like [can] have these conversations cause no one's like explicitly said that. And I always feel like counseling is something of like, I still don't know what my role is or like what I can do so I thought it was nice that you kind of like empowered us to do that. It's nice to have a student tell you that you can go in there and say, You're due for this vaccine.

Figure 1. Comparisons of Pre/Postsurvey on Vaccine Hesitancy Attitudes, Confidence, Vaccine Inequity, and Intention (N=112)



*** for $p < 0.001$, ** for $p < 0.01$, and * $p < 0.05$

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Presentations:

Presented Lecture: "Confronting Vaccine Hesitancy: An Innovative Student-Led Curriculum for a Family Medicine Clerkship" at 2023 STFM Medical Student Education Conference, New Orleans, LA.

Presented Lecture: "Confronting Vaccine Hesitancy: A Qualitative Assessment of an Innovative Student-Led Curriculum for a Family Medicine Clerkship" at 2024 STFM Medical Student Education Conference, Atlanta, GA.

Conflicts of Interest: The authors have no conflicts of interest to declare.

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