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Evaluation of a Synchronous, Online Diabetes Nutrition Education Program for American Indians and Alaska Natives With Type 2 Diabetes: Facilitators and Participants' Experiences

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ABSTRACT

Objective: To explore the overall experiences of key players involved in a culturally adapted, online, synchronous diabetes nutrition education program across 5 reservation tribal and intertribal urban Indian clinics.

Methods: A multimethods design, including postclass surveys with Likert-scale and short-answer questions, was completed after each of the 5 classes. Participants (n = 54) and class facilitators/coordinators (n = 10) completed postclass surveys (n = 189 and 58, respectively). A subset of participants (n = 24) and all class facilitators/coordinators (n = 10) engaged in online focus groups after the conclusion of program implementation. Qualitative thematic methods and frequency distributions were used to analyze the data.

Results: Most participants reported that the classes were enjoyable (94%), culturally respectful (77%), and easily accessed online (68%). Qualitative themes included (1) class satisfaction, (2) class improvements, (3) preference for class facilitator, and (4) recommendations to improve recruitment and retention.

Conclusions and Implications: These findings will guide program modifications to provide improved diabetes nutrition education for American Indians and Alaska Natives adults with type 2 diabetes.

Key Words: American Indian and Alaska Native, type 2 diabetes, qualitative, online, diabetes nutrition education

INTRODUCTION

Nutrition education is 1 of the cornerstones of a comprehensive diabetes education and support program. The literature suggests that diabetes nutrition education is associated with positive outcomes for people with type 2 diabetes (T2D), including improved dietary self-efficacy (ie, confidence that one can follow a healthy diet), intake of healthy foods (eg, whole grains, high fiber, lean protein, low in added sugar and sodium), and glycemic management.^{1,2} Nutrition education interventions are particularly effective when developed to meet the needs of specific communities. For instance, nutrition education that prioritizes those who experience limited income has been shown to improve intake of healthy foods and to mitigate healthy eating

barriers such as food insecurity through education specific to food resource management (eg, meal planning, grocery shopping).³⁻⁷ One 2019 review of the effect of the US Department of Agriculture's Supplemental Nutrition Assistance Program Education (SNAP-Ed) revealed stronger evidence for SNAP-Ed nutrition education as an effective means of improving food security than its effects on dietary outcomes, though indicated that consistent measurement tools, more rigorous study designs, and long-term outcomes are needed.⁸ Although the literature supports the value of such interventions, to our knowledge no up-to-date, large-scale, diabetes-specific nutrition education programs that prioritize American Indians and Alaska Natives (AI/ANs) with existing T2D have been developed. Given high rates of diabetes and resulting complications among AI/ANs,^{9,10} and the fundamental role food plays in traditional cultural practices in AI/AN communities,^{11,12} the need for such interventions is compelling.^{13,14}

American Indians and ANs have the highest prevalence of diabetes among all racial/ethnic groups in the US¹⁵ and experience a significant burden of comorbidities. In a study comparing the prevalence of comorbidities among American Indians with diabetes to that of a commercially insured US population with diabetes, American Indians had significantly higher rates of hypertension, cerebrovascular disease, renal failure, and lower-extremity amputations.¹⁶

American Indians and ANs also experience profound social inequities that undermine opportunities for wellness, such as experiencing the highest poverty rate of all racial and ethnic groups in the US.¹⁷ Such inequities result from colonization, forced removal from Native lands, forced attendance at boarding schools to support assimilation, and continued racist policies perpetuating unequal opportunities for Native people.¹⁸⁻²⁰ Empowering individuals and their families with diabetes education and support focused on enhancing selfcare strategies is 1 way to improve stress-coping responses and resilience to inequities.^{21,22}

The American Diabetes Association's (ADA) *What Can I Eat? Healthy Choices for People with Type 2 Diabetes* (WCIE) curriculum is a 5-lesson diabetes nutrition education program for adults with T2D and their families. *What Can I Eat?* is taught by registered dietitian nutritionists (RDNs) who have been master-trained by ADA RDNs. Each class includes a didactic session, interactive learning activities, physical activity, mindful eating activity, and goal setting.²³ Example topics covered in the classes include the diabetes plate, food label reading, and healthy eating on the go.

In 2018, the Minnesota-based Shakopee Mdewakanton Sioux Community partnered with the ADA to fund a grant supporting the development of a culturally targeted version of WCIE for AI/AN adults with T2D. Cultural adaptation of the curriculum was driven primarily by in-depth qualitative interviews and focus groups conducted with Native adults with T2D and their family members, as well as community leaders and clinicians in 2 urban and 2 rural AI/AN communities across the country.²⁴⁻²⁶ Key ways in which WCIE was adapted for AI/AN adults include the incorporation of a focus on healthful traditional Native foods (eg, beans, corn, squash, walnuts, fish, wild game) and designing in-class activities focused on mindful eating so that they align with AI/AN culture (eg, food gathering visualization mindful activity). In response to the coronavirus disease 2019 (COVID-19) pandemic, which disrupted pilot testing of the adapted curriculum, researchers retooled the curriculum for synchronous, online delivery.

Pilot testing resumed using this remote delivery method in January 2021. Among the goals of the pilot test was to obtain feedback from adults who participated in the adapted program, RDN educators who facilitated the classes, and site coordinators who oversaw curriculum delivery and evaluation. Pilot testing was essential to ensure the intervention met the needs of the priority audience before implementing it on a larger scale. This paper summarizes key themes and findings from postclass surveys and focuses groups aimed at helping us identify potential areas for improvement in the curriculum.

METHODS

Study Design

The pilot evaluation of WCIE for AI/AN adults with T2D took place at 5 collaborating reservation-based tribal and intertribal urban Indian clinical sites. Sites were located in the following states: New York (NY), Oklahoma (OK), North Carolina (NC), California (CA), and Illinois (IL). Classes were facilitated by site-based RDN educators who typically taught students from their centers. In some cases, an RDN from the NY site taught remote WCIE classes that included participants from NY, OK, and IL (the latter 2 because of limited RDN staffing at sites). At some sites, the RDN who facilitated the classes also served as the site coordinator, recruiting and consenting participants, scheduling and coordinating the online classes, and overseeing data collection. At other sites, the site coordinator and the RDN class facilitator were different people. Participants were randomized into either an immediate intervention or a waitlist control group. The former group started WCIE classes immediately after recruitment, continuing for 4 consecutive weeks (classes 1–4), with a fifth class occurring 3 months after the first class. Waitlist participants started classes approximately 12 weeks after recruitment. Once the intervention began for participants in the wait list group, the timing of classes mirrored that in the immediate intervention group.

After each of the 5 90-minute WCIE classes, WCIE participants and class facilitators completed a postclass feedback survey. This survey included both Likert-scale and short-answer questions. To encourage participants to provide honest feedback, surveys were collected anonymously. After all, classes were completed across all sites, a sample of WCIE participants took part in remote patient focus groups, and all RDN educators and site coordinators participated in remote facilitator/coordinator focus groups. The purpose of the focus groups was to understand the comprehensive WCIE class experiences and recommendations for improvement from each of these key stakeholder groups as supported by a constructivist epistemology.²⁷ In this paper, we report findings from the focus groups and participant and facilitator feedback in response to postclass surveys. We employed multiple methods to ensure we queried participants immediately after each class (eg, postclass feedback surveys) to understand their recent, individual perspectives and focus groups after completing all classes to understand comprehensive class experience through peer-to-peer dialogue.²⁸ The University of Colorado Anschutz Medical Campus Institutional Review Board, the Indian Health Service National Institutional Review Board, and required tribal Institutional Review Boards approved

this study as expedited before human subjects research commenced. Participants completed a written informed consent, and class facilitators/educators completed oral consent.

Participants and Recruitment

Site coordinators identified and recruited participants through their site-based diabetes registries. Participants were required to be AI/AN, diagnosed with T2D, fluent in English, and without plans to move from the area within 6 months of recruitment. Site coordinators recruited additional participants through posted flyers, eNewsletters, social media (eg, clinic Facebook site), and clinician referrals. Of note, 2 of the 5 sites began recruitment and offered classes 1 and 1–3, respectively, in person before the beginning of the COVID-19 pandemic. These 2 sites and the other 3 continued all recruitment and data collection remotely to adhere to COVID-19 social distancing safety guidance. Patient focus group participants were recruited by each site coordinator through email or telephone invitation. All WCIE graduates from each site were invited to participate in a postclass focus group. In addition, all class facilitators and site coordinators were invited to participate in facilitator/coordinator focus groups by email invitation from the project director. Of note, the project director was not present for the focus groups as she was well-known by the class facilitators and coordinators.

Data Collection

Survey data were collected remotely using a paper-based, postclass feedback form for the WCIE participants and an electronic postclass feedback form for the class facilitators. Before classes commenced, each WCIE participant received a class kit in the mail or via no-contact pick-up at the collaborating clinic. In this kit, participants received all class materials (eg, food labels, 5 class-specific participant booklets) and all materials for data collection (eg, at-home HbA1c test kits, paper surveys, prepaid return envelopes). After each of the 5 WCIE classes, participants were instructed to complete the corresponding postclass survey and mail it back to their clinic. Site coordinators then scanned the surveys and sent in encrypted files to researchers at the University of Colorado Anschutz Medical Campus. Of note, for the several classes offered in person at 2 sites (before COVID-19), participants completed postclass feedback forms in person.

The descriptive participant postclass survey included 6 Likert-scale statements such as “I enjoyed taking part in today’s class” and “It was easy to get into and use the online classroom.” For each item, response options were as follows: strongly agree, somewhat agree, somewhat disagree, and strongly disagree. Participants also responded to 4 open-ended, short-answer questions (eg, What can we do to make today’s class better? Did you enjoy taking the class online? Why or why not?). The full text of the Likert-scale items is presented in the Table. These descriptive survey items were developed by AI/AN researchers and diabetes educators who serve AI/AN peoples. Participants received a \$20 gift card for attending each class and completing corresponding evaluation metrics required at each timepoint (ie, clinical metrics and/or surveys). Class facilitators also completed a postclass survey after each class. The survey included 9 open-ended, short-answer questions (eg, What suggestions do you have for improving this class session? How did the class go with regard to remote-based technology?).

Supplementary Data 1 presents the full text of each of the short-answer questions. This postclass written feedback survey was adapted from the ADA’s original *What Can I Eat?* program.²³

After all sites had completed implementing the curriculum, postcourse focus groups were conducted with participants. Each site coordinator invited all WCIE participants to engage in the postcourse focus groups. The 75-minute focus groups with WCIE class participants were facilitated by a trained focus group moderator who is an American Indian RDN and was not known by the participants. All focus groups were conducted via Zoom (Zoom Video Communications, Inc, 2021), and participants from different sites were in the same focus groups. Focus groups were selected as the data collection method to intentionally offset the power dynamic between researcher and participant and to facilitate participant-to-participant sharing and interaction.²⁹ Example moderator guide questions included “Tell me about your experience with WCIE classes” and “If you were going to describe these classes to a friend, what would you say?” Moderator guide questions were developed by a trained qualitative researcher in collaboration with experts in AI health and qualitative methods.²⁹ Supplementary Data 2 presents the participant focus group moderator guide. Focus group participants received a \$50 gift card for their time.

Table. *What Can I Eat?* Diabetes Nutrition Education Program Participant Postclass Feedback

Survey item	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
I enjoyed taking part in today’s class	178 (94.2)	10 (5.3)	1 (0.5)	0 (0.0)
Today’s class taught me a lot about how to eat in a healthy way with diabetes	159 (84.1)	29 (15.3)	1 (0.5)	0 (0.0)
It was hard to understand some of the information covered in today’s class	13 (7.1)	12 (6.6)	31 (17.0)	126 (69.2)
Things related to my culture were presented in a respectful way in today’s class	140 (76.9)	35 (19.2)	4 (2.2)	3 (1.6)
The teacher was very knowledgeable	170 (93.9)	6 (3.3)	0 (0.0)	5 (2.8)
It was easy to get into and use the online classroom	84 (68.3)	24 (19.5)	5 (4.1)	10 (8.1)

Note: Values are n (%). Participants were not required to answer all questions on any given survey.

Class facilitators and site coordinators also engaged in a post-course focus group, which was facilitated by an AI clinician/researcher with expertise in diabetes education and qualitative methods, who the participants did not know. Example moderator guide questions for the class facilitators and site coordinators included (1) Tell me about your experience with the WCIE classes and (2) If you were to describe these classes to a friend, what would you say? Class facilitators and site coordinators received a \$100 gift card for their time if their organization allowed such compensation (ie, federal employees were not eligible for this stipend). Focus groups were conducted in September and December 2021. All focus groups were audio recorded using Zoom technology, transcribed verbatim by a professional transcription service, and checked for accuracy/deidentified by the lead qualitative researcher.

Data Analysis

Data from the focus groups and short-answer portion of the surveys were analyzed using qualitative thematic analysis.³⁰ This method allowed the researchers to compare and contrast across all transcripts and short-answer survey questions for common themes. A combination of inductive and deductive coding approaches was employed.³¹ The deductive coding approach was informed by interview moderator guides and short-answer survey questions. For example, the deductive code “technology: trouble with connection” denoted comments about challenges with connectivity for Zoom-based classes. Inductive coding also served in the analysis to identify themes that emerged from the data.^{32,33} For example, a prominent inductive code was satisfaction: camaraderie, with participants sharing that a strong point of satisfaction with the WCIE classes was a sense of camaraderie with other AI/ANs who have T2D. Codes were then collapsed into categories, and subsequent overarching key themes emerged. One qualitative researcher analyzed all data and met with the 2 focus group facilitators to discuss codes and emergent themes. The lead qualitative researcher is a PhD-trained qualitative methodologist specializing in diabetes nutrition education. Qualitative data analysis and data organization were digitalized using Atlas.ti (version 8.1.1). This qualitative data analysis software assisted the researchers in organizing, sorting, and coding and helped to facilitate a transparent analytical process.³⁴

Descriptive analyses were computed for the Likert-scale questions included in the participant postclass feedback survey. The frequency distributions were computed for each question when collapsing data across all classes and sites. To allow exploration of possible class-level variation in responses, descriptive analyses were recomputed by class session. These analyses were intended to help the research team identify specific class sessions that may not have fully met participant needs. Analyses were conducted in SAS (version 9.4, SAS Institute).

RESULTS

In total, 189 postclass feedback surveys were returned by WCIE participants (n = 54), and 58 surveys were returned by class facilitators. As shown in the Table, participants were largely quite positive about the classes. Most participants strongly agreed or somewhat agreed that they enjoyed taking part in the day’s class (99.5%), that they learned a lot from the class (99.4%), that the class facilitator had been very knowledgeable (97.2%), and that the class presented their culture in a respectful way (96.1%).

Although still strong, participant responses to other survey questions showed slightly lower satisfaction levels. Most participants (86.2%) strongly or somewhat disagreed that it was hard to understand some of the information covered in the day’s class. Notably, 13.7% agreed with this statement. Examining responses by class (data not presented) suggested slightly higher agreement that some information was difficult to understand for classes 2 and 3 (15.0% and 17.9%, respectively) compared with classes 1, 4, and 5 (11.1%, 12.9%, 11.1% respectively). Similarly, although 87.8% of participants strongly or somewhat agreed that it was easy to access the online classroom, 12.2% disagreed. The percentage of people who disagreed with this sentiment was substantially higher in class 1 than in class 4 (26% vs 3.7%; data not presented).

Nine focus groups were held for WCIE program participants (n = 24), with sizes ranging from 2–4 participants in each group. However, one focus group only had 2 participants because the participants still outnumbered the researcher; this data is included in the dataset.²⁹ Two focus groups were held for class facilitators and site coordinators (n = 10 individuals; focus group size 4 and 6, respectively). Across all focus group transcripts and the short-answer questions included in the participant and facilitator feedback surveys, 4 crosscutting themes emerged. First, class satisfaction among participants and facilitators largely relied on peer-to-peer interaction, camaraderie felt by participants, and participants' perceptions of broader support from the clinic, diabetes program staff, and/or tribe. The second key theme focused on the experience of remote WCIE classes, including the pros, cons, and tips to improve future online classes. Third, focus group participants discussed the importance of carefully selecting class facilitators, with a strong preference for these facilitators to be AI/AN and trained experts in diabetes and nutrition. Finally, focus group participants discussed strategies to improve class recruitment and retention and the desire to continue WCIE classes in their community.

Class satisfaction centered around peer-to-peer camaraderie and support. The first key theme is that satisfaction among participants and class facilitators was strongly influenced by in-class peer-to-peer interaction opportunities and camaraderie among participants. Participants expressed how much they appreciated having discussion time with peers, learning tips for healthy eating from their peers, and the socialization and camaraderie that came with being in a series of classes with the same group of peers. When asked what was most important about the WCIE classes, 1 participant shared: "I know that I appreciated having the group there to learn from each other, that was huge." Another participant elaborated:

Well, camaraderie among each other, and listening to some of the problems they were having. It was kind of nice to have it in that setting, because as I had mentioned before, 1-on-1 with a nutritionist almost seems like they're preaching at you. But it's nice to hear that somebody else had same problems that I had, could associate with problems that I was experiencing.

In response to the same question, another shared:

It was nice to just share space with people in the same situation as me. So, it was nice to share that space and stories with them, and share the different tips, and even just being their supporters, because a lot of them were older than me.

Class facilitators also noted the participants' enjoyment in talking with and supporting 1 another, as exemplified here:

Well, there's a lot of chatting. Which is great for support system, it was almost hard to get through the lessons because everyone just wanted to share and talk with one another – it was usually about diabetes and diet though, so often I let them keep talking.

Participants discussed the peer-to-peer interactions as an important part of their diabetes support and highlighted the broader support they felt, such as support from the class facilitator, from the clinic/diabetes program for offering the classes, and in some cases, from the tribe for

diabetes support (eg, diabetes wellness program within a clinic). Because WCIE classes were offered during the COVID-19 pandemic, participants acknowledged support specific to COVID-19 testing, vaccines, and social distancing guidance from their health care organization and tribe. One participant discussed her diabetes program's wellness center:

So we're lucky, we have state of the art [wellness] center where we can exercise for free, see the dietitian, and even with COVID-19, yeah, they shut down for a while, but our tribe was quick with mask rules and social distancing. I think I was doing Facebook Live with the dietitian for a while - but now I'm back at the center, masked up and ready to go.

There was robust feedback regarding the online delivery of WCIE classes, including pros, cons, and tips to improve future online classes. Participants were mixed on whether they thought they would prefer online WCIE classes to in-person classes. Several participants noted weaknesses of the online format, highlighting challenges related to internet connectivity, inability to cook/taste foods and recipes during the class, and lamenting the loss of an in-person experience. Notably, comments about challenges with internet connectivity were noted largely in the postclass surveys and were not discussed in the focus groups. Concerns about technical issues were addressed by comments such as: "I kept getting kicked off the internet" and "it was hard because sometimes my video and audio wouldn't both be working." Even with the technical challenges noted, participants frequently shared that they understood the benefit of online classes during COVID-19, with some participants stating, "for right now, it's better we don't meet in person" and "virtual classes made it safe to keep taking care of my diabetes with my dietitian."

Participants who shared positive feedback about the online format were primarily focused on the safety (COVID-19-related) and convenience (eg, no need for transportation) of the online classes. They discussed common challenges of getting to in-person classes related to transportation, child and elder care responsibilities, and the cost of gas to travel to/from the clinic. One participant shared:

Like I said, I have a kiddo and I didn't have to find someone to watch him. And there was even a week where I just didn't feel so good and I probably wouldn't have went to the class if it was outside my home. And so it was very helpful, saved gas and it was real easy to not have to plan your day on getting there . . . it was just turn on the computer and go.

Regarding the future use of online classrooms, participants suggested that in-person and online would best meet the needs of the AI/ANs with T2D in their communities. One suggested:

I think it's probably good to offer in different formats. I think [Another Focus Group Participant] said she may not have wanted to participate if it was just, she'd have to travel to the hospital and stuff. She can do it online. . . . I think what I'm getting at is . . . offer the information in different formats. I personally would rather do it face-to-face, but I can see that some people are more comfortable online.

Participants thought including in-person cooking classes and demonstrations, as well as video instruction for the physical activity portion of each session, would greatly benefit the

classes. They suggested it was hard to follow the class facilitator during the exercise activity and that the facilitator “just play a video of the exercise and then we can watch it later too.”

Finally, participants suggested that for the online component of future classes, it would be nice to have AI/ANs from across the country in the same classes. One participant who was in a WCIE class that included AI/AN adults with T2D from 3 different states said:

The individuals that I was a participant with, . . . they weren't from here, they were all the way in [CITY]. And they always shared some interesting things that helped me to say, 'Hey, yeah, that's what I've experienced that too.' This was a new dietitian to me, I think they knew her, but it was nice to connect with new people who didn't know me.

Careful selection of the class facilitator is important, and it is ideal if the facilitator is AI/AN and a trained expert in diabetes and nutrition. *What Can I Eat? Healthy Choices for People with Type 2 Diabetes* participants suggested the class facilitator is very important to the participants' experience. They suggested that, in the past, they have worked with nutrition professionals who “just kind of talk down to you” or “tell me what to do and aren't really seeing me fully.” Especially for the sections of the WCIE course that focus on traditional Native foods, participants preferred that the educator be AI/AN, be well versed in AI/AN culture, or at least that they consult with community members to identify important cultural food topics. One participant shared:

Can I make another suggestion? Just the people that are teaching this class, they probably need to sit down with some of the community members that are going through this, and discuss, 1-on-1, or in a group setting, and say, “Okay, educate me about your culture and your foods. Educate me so that I know how to approach it and teach.” Because to be honest about it, you could look at some of those girls and you could tell they never had a lye dumpling, piece of bean bread and fried potatoes with ramps and stuff in them. They need to be educated in our culture and what we eat.

Participants discussed the benefits of peer educators or elders serving as educators for younger community members with T2D, specifically regarding traditional foods. Addressing the WCIE lesson on unsweetened traditional beverages, 1 participant suggested:

And the other thing is, I feel maybe a class or 2 outside of the program, maybe for tea testing or to meet with the local herbalist or a traditional medicine person would've been good to go along with that tea portion and the education around it. And then even when we talked about traditional foods, maybe something related to preparing a traditional dish, like a healthy 1, not like... I hate to say it but not like Indian tacos.

At the WCIE sites, in which the class facilitator was well-known to the participants as a long-standing clinician in the community, participants expressed the importance of knowing their RDN and her commitment to the community. One shared:

[NAME] has been our dietitian for a long time – and I can count on her. I can call her or text her and she's more than just telling me what to eat, she understands and really problem solves with my whole life. I know she cares, it's not like just her “job.”

Because many Native communities do not have RDNs, 1 question in the moderator guide for the facilitator focus groups addressed the possible role of non-RDNs in facilitating the WCIE classes. Class facilitators, all of whom were RDNs, were concerned about the ability of a non-RDN to answer complex diabetes-related questions or discuss challenging nutrition topics (eg, how beans fit into the diabetes plate as both a carbohydrate and a protein food). One suggested solution was a coteaching model, including an RDN and a community-based educator. One facilitator explained:

I've been here a long time, I mean, over 20 years, but I'm not part of the community. So, there are certain topics – I mean everyone knows me and I think trusts me at this point – but some of the cultural-specific topics, I have no business teaching. It is best when our CHW [community health worker] is there to guide those conversations. And that's what they are when we talk about cultural foods conversations – letting the participants share their knowledge with each other.

Focus group participants shared strategies to improve class recruitment and retention and strongly desired to continue offering WCIE classes in their communities. Class facilitators and site coordinators indicated that challenges with recruitment were largely related to the ongoing COVID-19 pandemic and competing interests that posed challenges for their patient populations. For example, caring for children or grandchildren during pandemic-related home/remote schooling and caring for family members who were ill with COVID-19 were additional stressors that site coordinators suspected were complicating recruitment.

Participants discussed the need to know your community when recruiting for health education programs. They discussed the importance of recruitment information being passed by word-of-mouth and recruitment efforts involving trusted members of the community, as described here:

Oh, I don't know if it helps or who is getting trained, but maybe peer leaders would help. So instead of professionals, people in the community, like volunteers in the community to get trained in the program. That way maybe they can bring it to their group of friends or family and just try to be able to go somewhere with a familiar group of people and they all participate in the program and then from there, they spread the word. And maybe they recruit one or 2 other community members to get trained in a program too and then they can do the same thing.

Class facilitators and participants suggested the online classes were a bit too long and would like to offer more time for peer-to-peer discussion. One commonly suggested solution was to break some of the classes into 2 or 3 classes and have more than 5 classes in the WCIE series. Another strong recommendation for class retention was to continue offering participants the \$20 gift cards for attending online WCIE classes. One participant shared:

I mean, in all honesty, I didn't really want to take the classes. My doctor had suggested them because I was struggling with what I was eating and my A1C was super high. And they told me that we would get you gift cards.. I just have to sit and listen and take in some knowledge that I need anyway. They were \$20 gift cards for me anyway. And it

wasn't a lot of money, but it was just I don't think I would've taken the classes without it, to be honest. That was my kind of like, 'Oh well, I could make a little extra money and go use it for gas' – I can't even explain how high gas is getting – or use it for groceries or whatever. And so, I signed up because of the incentive.

Participants suggested additional in-person components be added to the WCIE curriculum that they thought would help with recruitment and retention. For example, having a shared meal at classes, cooking demonstrations, food-tasting opportunities, and grocery tours were described as strong incentives to attend classes. Across the feedback surveys and focus groups, site coordinators, class facilitators, and participants thought a hybrid class model would serve the greatest number of people. This could include both online and in-person options, and depending on the participant, they could choose to attend in whatever format best suited their schedule or lifestyle. Finally, participants noted that the class kit they received, including all class-related materials, was very helpful in their class participation and monitoring of their health. They said the items included in the box, such as a scale, blood pressure monitor, measuring cups, reusable lunch bag, fruit-flavored beverage infuser, and participant booklets, made them feel like the class was high quality and “like I was getting really good value or, just high-end treatment as a patient in these classes.”

DISCUSSION

The WCIE curriculum was well received by program participants, class facilitators, and site coordinators. In response to the postclass surveys, most participants reported that the classes were enjoyable, a good learning experience, and culturally respectful. Key themes from the focus groups and short-answer sections of the postclass feedback surveys focused on the strengths of the program, recommendations for the curriculum, and preferences for class facilitators. Together, these key themes provide insight into the experiences of participants, class facilitators, and site coordinators. Class satisfaction resulting from peer-to-peer interactions and support is robustly discussed in the literature as a benefit of peer-to-peer education in the general population^{35–39} and AI/AN communities.⁴⁰ The timing of the intervention—which took place in 2021—may have influenced participant responses related to these peer interactions. The literature suggests that isolation and loneliness during this time was a serious mental health risk factor.^{41–43} Some AI/AN communities were disproportionately impacted by the COVID-19 pandemic, and tribes instituted strict quarantine guidelines to protect their citizens.⁴⁴ This may have impacted how strongly participants in this study responded to peer-to-peer interactions and discussion, given many had been living under COVID-19 quarantine restrictions during the WCIE classes.

Health care organizations developed robust telehealth and online support services to provide quality medical care to people living with diabetes during COVID-19.^{45–48} *What Can I Eat? Healthy Choices for People with Type 2 Diabetes* program developers also had to pivot program delivery in light of COVID-19 restrictions on in-person gatherings. Some key findings from this analysis identified important ways to improve program delivery in an online environment. Key suggestions for improving retention included decreasing the length of the online classes, increasing the frequency of the classes, and having more time for peer-to-peer

discussions. e-Learning theory supports these concepts, suggesting that online learning experiences for adults are best received when they are shorter in length and more frequent.⁴⁹ Literature suggests that, in AI/AN communities, online diabetes education has many potential benefits to reaching a wider audience and mitigating barriers to in-person learning, despite limited internet access in some communities.^{25,50} As with other audiences, the benefits of online learning specific to convenience, child/elder care barriers, and limited transportation were relevant to Native communities even before the COVID-19 pandemic.^{25,51,52} Of note, comments about issues related to internet connectivity were limited to the postclass surveys, which makes sense given the participants who elected to engage in postclass focus groups may be the ones who had reliable internet service and connectivity. Had we not collected postclass survey data, we might have missed the voices/feedback from those for whom internet connectivity was challenging. American Indian tribes are working diligently to improve internet connectivity for their people, and although some reservations still have challenges with connectivity related to remote/rural geography, the availability of this resource is improving.⁵³⁻⁵⁵

Participants also shared that incentives, whether financial, meals/food provided at classes, or resources to manage their diabetes (eg, scale, blood pressure monitor) are essential to increase recruitment and retention and are key recommendations to improve remote WCIE classes in the future. Providing incentives to improve diabetes education class engagement is well documented in the literature.^{56,57}

Across several themes, participants voiced the importance of including AI/AN community members as peer educators to help recruitment and retention and to facilitate the traditional foods portion of the WCIE classes. They discussed a preference for community member educators who are AI/AN and well-versed in local culture as trusted resources and who understand the culture and lifestyle of AI/ANs in their community. Among AI/ANs and other diverse cultural groups, diabetes education and prevention interventions that feature peer-educator models are known to be effective and accepted.⁵⁸⁻⁶³ In this body of literature, AI/AN peer educators provide education and support and make key community-based connections for AI/ANs with diabetes (eg, food security resources).^{60,64} In addition, diabetes prevention programs for AI/AN peoples that employ peer-educator models are well accepted and effective in these communities.^{4,65,66} However, participants and class facilitators in this study did note the importance of having an RDN-trained expert to answer complex questions about diabetes and nutrition.

Evidence is mixed regarding the ideal facilitator for diabetes nutrition education. In addition, evidence suggests that group-based nutrition and diabetes education classes taught by a multidisciplinary team including members such as a dietitian, pharmacist, physician, nurse, and behavior specialist⁶⁷ are feasible and effective in building self-efficacy, enhancing knowledge, and precipitating behavior change related to nutrition habits.^{68,69} For example, some studies have shown that clinical nutrition education is most effective when provided by an RDN (vs a non-RDN nutrition educator) for people with T2D.^{16,70} However, patients newly diagnosed with T2D have noted that interactions with dietitians often seem directive and not adapted to the individual, suggesting that RDNs could benefit from more supportive counseling styles, focusing on

ongoing, open communication and less directive education.⁷¹ Participants in this study also suggested they have had negative experiences with RDNs who did not understand or consider their patients' culture or life experiences when providing dietary guidance.

To accommodate participants' preference for including a community-based peer educator and facilitators' concerns regarding the capacity of a non-RDN to teach the classes, it may be prudent to consider a co-teaching model that includes both an AI/AN community health educator and an RDN. Hybrid classes, including both in-person and online components, and a co-teaching model, could particularly benefit sites that do not have an RDN available, as successfully evidenced by this study in which 1 RDN from NY taught participants across 3 states in the same classes (NY, IL, OK). The in-person component could be led by the AI/AN community health educator focusing on traditional foods, cooking education, and facilitating peer-to-peer education, whereas an RDN located remotely could present dietary information online. If the RDN educator is not a long-standing community member, the community health worker could help facilitate discussion of real-world barriers to healthy eating in the community and ensure that the educational approach is conversational and supportive rather than didactic and authoritative.⁷²⁻⁷⁶ To ensure that class facilitators communicate in a manner that is respectful, collaborative, and that acknowledges the lived experience and autonomy of participants, it may be valuable for the training of WCIE class facilitators to incorporate a module on strategies for effectively communicating with participants and motivating behavior change.

The results presented here provide crucial insight into the strengths and weaknesses of the WCIE curriculum adapted for AI/ANs and will serve to guide revisions to the program. A key strength of this project has been the robust emphasis placed on community feedback throughout WCIE program adaptation, implementation, and evaluation. The analyses presented in this report reflect an important step to ensure that the curriculum will meet the needs of AI/AN adults with T2D.

As with all research, this study has limitations. The pilot testing of the curriculum had just begun when the COVID-19 pandemic upended clinical care and health-related research across the country. Two of our sites had begun in-person implementation of the curriculum, one having completed classes 1-3 with their first cohort of participants and another having completed class 1 with their first cohort. The pilot test was halted, and the curriculum was redesigned for remote delivery. Almost a year later, these participants (n = 20) who had begun classes in person finished the curriculum via the online remote delivery method. For this group of participants, the lengthy gap between classes and the change in delivery format may have resulted in unique and different perceptions of the WCIE program. In addition, because the postclass feedback surveys were collected from participants anonymously, we could not examine change over time in participant responses. Finally, this was a pilot evaluation as we validated the impact survey and unique nature of the pivoted-to-online synchronous diabetes nutrition education with a small sample size. Findings from the impact survey validation and outcomes are forthcoming.

IMPLICATIONS FOR RESEARCH AND PRACTICE

The feedback from WCIE participants, class facilitators, and site coordinators in this study will guide key program modifications. We plan to refine the curriculum to include shorter, more frequent online classes; hybrid class options; and a co-teaching model that includes an AI/AN peer educator working with an RDN to teach the classes. For example, the AI/AN peer educator could lead in-person cooking classes as the literature suggests group cooking classes can benefit people with T2D, such as improving nutrient intake⁷⁷⁻⁷⁹ and increasing preparation and consumption of traditional healthy AI/AN foods.^{80,81} We will continue to provide incentives for class participation and will seek to involve AI/AN peer educators or trusted community members to aid in class recruitment and teaching about traditional healthy AI/AN foods. Although only a small group of participants (13.7%) reported having difficulty understanding content in any of the classes, we will carefully evaluate the refined curriculum to ensure that it will be understandable to participants across a wide range of health literacy levels.⁸² To address concerns regarding the style of communication employed by RDNs, we will incorporate concepts from motivational interviewing, a behavior change technique focused on helping people to develop their own goals and to identify and address barriers they see to making desired changes.⁸³⁻⁸⁶ Learning this approach may help RDNs to develop a communication style that will be perceived as respecting the agency and acknowledging the context of WCIE participants' lives.

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SUPPLEMENTARY DATA

Supplementary data related to this article can be found at doi:10.1016/j.jneb.2022.10.013.

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