Trauma-Informed Nutrition Education for Black/African American Perinatal Women with Substance Use Disorder: A Pilot Study

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Abstract

Background: Trauma-informed nutrition practices can enhance the physical and mental health of perinatal women of color with substance use disorder (SUD). This pilot study explored the organization's and participants' readiness for a trauma-informed intervention and its effectiveness in improving food resilience among perinatal Black and African American women (BAAW) in a multidisciplinary SUD treatment program. The goal was to establish preliminary research and expand existing literature on trauma-informed nutrition education interventions.

Methods: The study was conducted in three phases: assessing organizational readiness, evaluating participant readiness, and measuring the effectiveness of the intervention. Members of the organization's leadership and fifteen individuals enrolled in a SUD outpatient program participated. The study used questionnaires to assess the organization's and participants' readiness and six human-food interfaces: family food habits, food-related feelings and thoughts, nourishment, individual food habits, food skills, and personal nutrition. Both qualitative and quantitative data were gathered, and a paired t-test was used to evaluate improvements in these interfaces.

Results: Findings showed that the organization was prepared to adopt the innovative trauma-informed intervention. Participants showed readiness to engage, indicating a positive sign for adapting to change. There was significant improvement in food skills ($p < .04$), while other food interaction behaviors showed positive trends that were not statistically significant.

Conclusion: This pilot study provided baseline data on the significance of organizational support in adopting an innovative trauma-informed intervention and its effectiveness in promoting behavioral changes in BAAW with SUD. Future research should address the identified limitations and challenges related to implementation.

Keywords: Black Women, Pregnant and Postpartum Women, Trauma-Informed, Nutrition Education, Substance Use Disorder

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Healthy women lead to healthy families and society (Carr & Springer, 2010). Society faces a crisis when the health of women is in danger (Tilly & Scott, 2016). Traumatic experiences and adverse environmental factors have lasting effects on the health of Black and African American women (BAAW) and their children (White, 2023). Among infants born with medical issues, BAAW births had the highest rates of neonatal abstinence syndrome and mortality (Ely & Driscoll, 2024). Additionally, BAAW of low socioeconomic status experience health disparities at a higher rate (Woods-Giscombe, 2010).

Health disparities affect racial and ethnic minorities in the U.S., predominantly BAAW, leading to higher rates of chronic disease and premature death compared to non-Hispanic whites (Baffour & Chonody, 2009). Moreover, low-income BAAWs with substance use disorder (SUD) face significant health disparities (Oser et al., 2019). Variables contributing to health disparities in BAAW have been documented for decades (Baffour et al., 2020). Healthcare initiatives have targeted the needs of BAAW (Brach & Fraser, 2000); unfortunately, the gap remains unchanged. Risk factors make tailored support services crucial for perinatal BAAW with SUD (Vilsaint et al., 2019).

Trauma-informed care recognizes that trauma and health disparities can impact health outcomes (Han et al., 2021). Targeted nutrition strategies are essential to meet the specific needs and health disparities faced by pregnant BAAW (Grant at el., 2004), particularly those impacted by SUD (Rodriguez de Lisenko et al., 2022). It has been established that SUD is associated with poor nutritional status, malnutrition, and various forms of disordered eating, including food insufficiency and food insecurity (Wiss et al., 2018). Unfortunately, few studies examine the

nutritional risk factors of perinatal BAAW with SUD. Due to these disparities in health outcomes, finding ways to improve these health outcomes is imperative.

Nutrition education that incorporates trauma-informed practices offers a supportive space for perinatal BAAW with SUD to address their relationship to food and overcome barriers (Han et al., 2021). Such practices enhance recovery, reduce relapse rates, and promote healthier behaviors (Mosley & Lanning, 2020; Rodriguez de Lisenko et al., 2022). This pilot study explored the effectiveness of an innovative trauma-informed nutrition education intervention. It followed a structured three-phase approach: first, assessing organizational readiness; second, evaluating participant readiness; and finally, measuring the effectiveness of the intervention. The objective of this pilot study was to contribute preliminary research that enhances the existing body of literature regarding the efficacy of trauma-informed nutrition interventions for perinatal BAAW with SUD.

Method

The pilot study was conducted in partnership with a community-based organization (CBO) in Northern California that serves pregnant BAAW with known histories or current SUD and BAAW mothers with substance-exposed infants. The study was conducted in three distinct phases. The first phase involved assessing the organization's readiness. The Principal Investigator (PI) invited members of the organization’s leadership team to participate in the study via a formal email. Leadership team members were surveyed to evaluate the organization's readiness to adopt the intervention. The second phase focused on assessing the readiness of perinatal BAAW experiencing SUD to actively participate in the intervention. Participants were referred to the PI by peer navigators who provided home-visiting case management to perinatal BAAW with a SUD history. Finally, the third phase measured the effectiveness of the trauma-

informed nutrition education intervention to improve six human-food interfaces in perinatal BAAW with SUD. Table 1 presents the pilot study's logic model as a visual tool for planning and implementation. It depicts inputs, outputs, and expected outcomes, clearly stating the study's outcomes and intentions.

Table 1

Logic Model for the Evaluation of a Trauma-Informed Nutrition Intervention

Trauma-Informed Nutrition Intervention Summary

INPUTS	OUTPUTS		OUTCOMES		
Resources	*Activities*	*Participation*	*Short-Term*	*Medium-Term*	*Long-Term*
Principal Investigator (PI) P.I. Nutrition Expertise Trauma-Informed nutrition curriculum Surveys Peer Navigators Organization's Leadership Participants Funding (Participant's incentives) Time and effort	Assessment of organization and participant readiness Solicit support and permission from the organization's leadership. Communicate with peer navigators to provide study materials. Recruit participants according to inclusion and exclusion criteria. Conduct research to assess organization	Researcher Organization's Leadership Pilot study participants Peer-Navigators	A better understanding of preparedness to change A better understanding of trauma-informed nutrition education practices in the treatment of SUD Baseline evidence of the effectiveness of these practices in the field of nutrition targeting perinatal BAAW with SUD Increase research knowledge and understanding of trauma-informed care for perinatal BAAW. Increase research focusing on adverse psychological risk	Increase the number of participants enrolled in a program Stimulate additional research to be published addressing this topic and target population. Increase the number of programs that include trauma-informed care as part of common practices. Initiate new policies and guidelines for trauma-informed	Increase the number of people who make behavior change Increase community awareness and engagement in trauma-informed nutrition practices in SUD. Inform public health approaches and incorporate nutrition education. Improve the social and political issues and visibility around pregnant

Trauma-Informed Nutrition Intervention Summary

INPUTS	OUTPUTS		OUTCOMES		
Other Skills & Resources	readiness and evaluate the trauma-informed nutrition education curriculum. Conduct and perform data analysis. Evaluation of a trauma-informed nutrition education curriculum.		factors in perinatal BAAW. Improve food habits and decision-making in perinatal BAAW affected by toxic stress and trauma.	nutrition practices in SUD facilities. Improve psychological and environmental risk factors affecting recovery of BAAW in SUD programs.	BAAW with SUD. Increase availability of funding for additional research, program implementation and sustainability
Assumptions: ● Psychological and environmental risk factors are major blocks affecting the full recovery of BAAW in SUD programs ● Food habits and decision-making in BAAW are deeply affected by toxic stress and trauma. ● There is limited research focusing on adverse psychological risk factors in perinatal BAAW			External Factors: ● The social and political issues and visibility around perinatal BAAW women with SUD. ● The availability of funding for additional research, program implementation and sustainability		

Note. This table displays the logic of a complete list of inputs, outputs, and outcomes of trauma-informed intervention for this study.

IRB approval was received for this study (STUDY001956). In this pilot study, the human subjects were perinatal BAAW with SUD, considered a protected population in social research. Therefore, IRB approval was an integral part of this study.

Sample Population and Recruitment

During the initial phase of the study, the PI secured approval and obtained contact information from the CBO's Executive Director. This allowed the PI to formally invite the organization's leadership team members to participate in the study via email. Five individuals were contacted, and all responded by completing the organizational readiness questionnaire (Centers for Disease Control and Prevention, 2019).

During the study's second phase, the PI enlisted participants with the support of peer navigators, who promoted the study to women. Peer navigators utilized a script to encourage participation in the study, either in person or by phone, from potential participants. Interested individuals received a flyer with the PI's contact details and then contacted the PI by phone to schedule their participation. Interested women contacted the PI to enroll for the intervention and data collection. At the end of the intervention, participants received a $100 gift card as an incentive to encourage their engagement and ensure they completed the intervention.

The eligibility criteria for participants were as follows: self-identification as BAAW, aged 18-40, BAAW who were pregnant or have recently given birth, BAAW with a history of SUD, BAAW currently struggling with SUD, and BAAW whose infants have been exposed to substances. All participants were required to have a connection with a peer navigator.

Initially, 20 individuals volunteered for the pilot study, but five dropped out, leaving 15 participants. The study implemented a trauma-informed nutrition education intervention, serving 25% of the BAAW participants enrolled in the SUD program, which had 80 women. All participants had regular and close interactions with their peer navigator throughout the intervention. The demographic of participants is described in Table 2.

Table 2

Participant Demographics

Participant Demographic	**%**	**n=15**
Age *M*= 22 yrs.		
20-30	40%	6
30-40	53%	8
40+	7%	1
Single	60%	9
Married or in a "cohabiting relationship	33%	5
Separated	0.0%	0
Divorced	7%	1
Widowed	0.0%	0
Less than high school	7%	1
High school	47%	7
Vocational/Trade/Technical School	13.3%	2
Some college	27%	4
Bachelor's degree	0.0%	0
Advance degree	7%	1
Employed		
Yes	27%	4
No	73%	11

Description of Intervention

The pilot study ran from January 2021 to July 2021. The PI sought support from the organization's leadership and management. After receiving permission to conduct the study, the PI emailed peer navigators to discuss the study protocol and outreach materials to generate interest in the nutrition intervention. Peer navigators encouraged participants to contact the PI to enroll. Participants signed a consent form and were given available times to start the nutrition intervention.

The PI conducted five individual phone sessions on nutrition, incorporating trauma-informed engagement and motivational interviewing. The curriculum aimed to improve cooking skills, promote food safety and encourage healthy eating practices. Due to COVID-19, practical cooking exercises were not possible. The program also focused on stress, emotional eating, health values, and feeding children. It included guided discussions and interactive exercises to build healthy connections to food, self, and community, supporting participants' nutritional well-being.

Instrumentation and Measures

In this pilot study, we collected data using open-ended and multiple-choice questions. We also gathered quantitative data on the organization's readiness to adopt an innovative trauma-informed nutrition educational intervention, the participants' readiness to accept the intervention, and the curriculum's effectiveness in improving food knowledge and resilience among perinatal BAAWs with SUD in an outpatient recovery program. The formative data on the organization and participants' readiness guided the planning and implementation of the intervention to address participants' needs.

Procedures of Study

Phase 1: Organizational Readiness

Five key leaders, including one board member, executive director, program director, program manager, and peer navigator, were chosen to complete a readiness questionnaire. The study's PI emailed them to provide their perspectives on the organization’s operations. The study assessed organizational readiness using the updated 2019 CDC Worksite Health ScoreCard, validated at 93 worksites (Centers for Disease Control and Prevention, 2019). It confirmed face validity and reliability through cognitive interviews and site visits. The Organizational Readiness

Survey (ORS), adapted from the CDC ScoreCard's Organizational Supports module, includes open-ended and multiple-choice questions. The ORS aligns with the Consolidated Framework for Implementation Research's fourth domain, focusing on the interplay between individuals and organizations and its impact on behavior change (Damschroder et al., 2009). The survey also incorporates Roger's Diffusion of Innovation Theory, highlighting the importance of communication channels, information sources, and influence in successfully spreading innovations (Rogers, 2002). The ORS collected initial data to gauge the organization's readiness by assessing leadership support for the trauma-informed nutrition education intervention. The survey included nine open-ended questions to gather data on the organization's culture, structure, commitment, and readiness for change. This data was used to predict the leadership's readiness to adopt and support the dissemination of the new intervention.

Phase 2: Participants Readiness

The study's second phase assessed participants' Stages of Change, food habits, and emotional state. The nutrition consultation section of the Health Behavior and Stages of Change Questionnaire (HBSCQ)(Gonzales-Ramirez et al., 2017) assessed participants' readiness and openness to receive professional nutrition information. For the purpose of this study, only the nutrition consultation section of the questionnaire was administered to women before participating in the intervention. Other parts of this initial assessment included an open-ended question regarding participants' motivation to engage in the intervention and data on current physical activity levels to assess participants' interests and health behaviors. The formative data collected informed the PI's method for delivering the intervention, tailored to each participant's initial stage of change at the beginning of the program (Prochaska & DiClemente, 1983).

Phase 3: Intervention Assessment

The final stage of the study utilized the principles of Motivational Interviewing (Miller & Rollnick, 2023) to deliver the intervention to participants. The effectiveness of the trauma-informed nutrition education intervention was assessed using pre- and post-surveys. Pre- and post-surveys were designed to assess six areas of human-food interfaces and the mental state of the participants: 1) family food habits, 2) feelings and thoughts, 3) food and nourishment, 4) individual food habits, 5) individual food skills and 6) personal nutrition habits. Seven questions assess family food habits. The questionnaire was developed specifically for this curriculum, as no previously validated tool was available. Table 2 provides information on the study objectives that were measured.

Table 3

Measurable Study Objectives

Study Objective	Measurement	Data Collection Instrument
Improve in family food habits	7-question scale. Response options (5-points): never, seldom, sometimes, most of the time, and almost always	Pre- and Post-Intervention Survey
Improve in feelings and thoughts	12-question scale. Response options (5-points): strongly disagree to strongly agree	Pre- and Post-Intervention Survey
Improve in food and nourishment	4-question scale. Response options (5-points): strongly disagree to strongly agree	Pre- and Post-Intervention Survey
Improve in individual food habits	5-question scale. Response options (5-points): never to almost always	Pre- and Post-Intervention Survey
Improve in individual food skills	9-question scale. Response options (5-points): poor to good	Pre- and Post-Intervention Survey
Improve in personal nutrition habits	6 food frequency questions. Response options (4-7 points): rarely eat to 4 or more times a day.	Pre- and Post-Intervention Survey

Note. This table displays the measurement of study objectives, measurement tools, and data collection tools used for this study.

Data Collection

Formative research occurred during phases 1 and 2 of the pilot study. Phase 1 collected quantitative and qualitative data from key members of the organization's leadership through an organizational readiness survey. Phase 2 collected quantitative data from the focus population through the nutrition consultation survey, an open-ended question regarding motivation to participate, and physical activity behavior. Lastly, phase 3 assesses the impact of the intervention on participants' human-food interfaces, which was evaluated using pre- and post-intervention food behavior surveys provided before and after the intervention.

All women participating in the study received a consent form and information about the research objectives, incentives, and data collection methods. The PI contacted participants by phone at various times during the day to deliver the trauma-informed nutrition education intervention. The information regarding the study and intervention was presented using well-structured scripts, ensuring clarity and accessibility for all participants. The PI also gathered data by taking field notes and memos to keep a record of participant interactions and personal reflections. All participants received a $100 gift card as an incentive following the completion of the intervention.

Data Analysis

The study analyzed qualitative data by reviewing and organizing it into codes and themes that were combined in a coherent manner. Excel was used to conduct content analysis. The PI created a codebook by coding emergent themes. A trained research assistant coded 20% of the data and examined inter-coder reliability. Any discrepancies between the two coders were discussed and resolved until they reached an agreement of at least 90%. The study employed the

constant comparative method and updated the codebook accordingly. The qualitative and quantitative data offered insights into the organization's readiness to adopt the innovation and the participants' willingness to receive the intervention. Based on the assessment of engagement level, investment, and collaboration in developing the innovation infrastructure, the study grouped the themes into specific categories, revealing the characteristics and inner workings of the organization's readiness to adopt the innovation. For participants, the open-ended questions and surveys provided baseline data on the stage of change, motivation, and physical activity behavior.

The pilot study also used Qualtrics, a HIPAA-compliant survey system from the University of South Florida, for data collection. Data safety was ensured through Transport Layer Security encryption.

This study tested the trauma-informed nutrition intervention as an independent variable, while human-food interfaces and mental state were measured as dependent variables. The dependent variables included family food habits, feelings and thoughts, food and nourishment, individual food habits, individual food skills, and personal nutrition habits. Descriptive statistics were used to analyze the data distribution of each scale, using frequencies, percentages, means, and standard deviations. A paired sample t-test was used to examine the significant improvements in dependent variables after participating in the intervention compared to baseline data to achieve the study's objectives and test hypotheses. A two-tailed hypothesis testing was used with a significance level of $p < 0.05$. Non-normally distributed data were transformed before the analysis, or a non-parametric statistic test, Wilcoxon test, was performed. It is important to note that the hypothesis testing was exploratory due to the small sample size.

Results

Table 4 shows initial data from the ORS of five leaders at the partnering organization, providing insights into their readiness to adopt the trauma-informed nutrition intervention. The findings cover various aspects, including organizational culture, leadership commitment, and readiness to sustain the intervention.

Table 4

Organizational Readiness Assessments

4.1 Organization Readiness Leadership Data

	Board member	Organizational management	Program management & operations	Directly implementing services with target population	Community partner supporting the organization
Primary role	0.0%	25%	50%	0.0%	40%
I often do this as well	0.0%	25%	25%	25%	20%
I sometimes do this	0.0%	50%	0.0%	50%	0.0%
I never do this	100%	0.0%	25%	25%	40%

Note. This table shows the engagement levels and roles of the organization's leadership team, based on the percentage of respondents.

4.2 Organizational Readiness Qualitative Data

Readiness Qualitative Question	Percentage of Responses
Is there a plan for nutrition education services?	
• Yes, our plan includes specific materials and procedures on nutrition education	0.0%
• Yes, our plan mentions nutrition, but we do not have set materials and procedures	20.0%
• No plan, but we include nutrition education when it makes sense	60.0%
• No, we do not currently incorporate nutrition education in our approach.	20.0%

How are nutrition education services funded?	
• Our funding requires that we include it in our services	0.0%
• Our organization provides it, but it is not required by our funding	40.0%
• Our organization does not directly fund nutrition education but provides it using partners who are separately funded	60.0%
• We do not provide nutrition education in our services	0.0%
How does nutrition education fit into the organization's culture?	
• Our organization is well-suited and very interested in providing nutrition education services	60.0%
• We are interested, but not sure how we could provide it	40.0%
• We do not see a good cultural fit	0.0%
What resources are in place to support nutrition education services?	
• A clear mission that includes nutrition education	0.0%
• Expert credentialed team members who specialize in nutrition education	20.0%
• Trained nutrition education staff	0.0%
• Time allocated in our existing approach to focus on nutrition education	0.0%
• Connections with community partners who prioritize nutrition education	80.0%
• Funding focused on nutrition education	0.0%
• None of the above	0.0%
How important is nutrition education in the scope of services provided?	
• It is critically important and central to what we do	0.0%
• It is an important part of our services, and we prioritize it	20.0%
• It is a valuable part of our services, and we try to incorporate it where we can	80.0%
• We wish we could spend time with it, but often do not have enough time or resources	0.0%
• We do not focus on nutrition education	0.0%
How feasible would it be for the org. to provide more nutrition education?	
• Very feasible	60.0%
• Somewhat feasible, and of interest	20.0%
• Somewhat feasible, but not of interest	0.0%
• Difficult to add, though we wish we could	20.0%
• Difficult to add, and not of interest	0.0%

Note. This table displays qualitative responses to questions about organizational readiness to adopt a new intervention. It evaluated leadership perceptions about change, resources, trust in leadership, concerns or potential disruptions, and perceived willingness to adopt the intervention.

4.3 Receptiveness of organization to change

How receptive is the org. to providing nutrition ed.?	Org. Leadership	Org. Culture	Org. Staff	Participants
● Strongly against	0.0%	0.0%	0.0%	0.0%
● Somewhat against	0.0%	0.0%	0.0%	0.0%
● Somewhat receptive	20.0%	20.0%	20.0%	40.0%
● Strongly receptive	80.0%	80.0%	80.0%	60.0%

Note. The diffusion of innovation theory (DOI) also offers valuable insights into how organizational culture and leadership influence the acceptance of new ideas. Organizational culture refers to the values, beliefs, assumptions, and norms that shape an organization's activities and mindset (Harvard Business School Online, n.d.).

4.4 Organizational Leadership Attitude Towards Nutrition Education Services

Question: *Why include nutrition education services?*	Response by Participant
Participant 1	● *Addresses basic needs*
Participant 2	● *Food and nutrition are considered one of the basic needs that our clients need in order to live a healthy and happy life. As we have seen, even so more recently, not everyone has the same access to healthy foods or does not have the same resources or skills to prepare healthy meals. Being able to provide nutrition education as a resource and skill will be valuable to the clients and communities we serve.*
Participant 3	● *Our campus community focused on health sciences and education always needs more resources on health and wellness*
Participant 4	● *Trauma-Informed*

Note. This table displays the organization's leadership attitudes toward adopting a new intervention, which was used to assess leadership support.

Individual Readiness

To evaluate participants' readiness, the PI selected survey questions from the nutrition consultation section of the validated HBSCQ (Ramirez-Gonzales et al., 2017). The participants' readiness to participate in the intervention results show that 47% reported never receiving nutritional advice and did not plan to do so. On the other hand, 40% of the participants are in the maintenance stage, indicating that they have already consulted a nutritionist and are following their recommendations. Table 5.1 displays the participant's Stage of Change before the intervention.

Motivation to Participate

The open-ended question regarding motivation to participate shows that participants enrolled in the trauma-informed nutrition education intervention to gain knowledge, improve their health, and maintain healthy habits for themselves and their families. Over 60% of the participants joined the program to acquire knowledge, while others aimed to adopt a healthier lifestyle and maintain healthy habits. Table 5.2 displays the participants' motivation to participate in the intervention.

Physical Activity Engagement

The study found that 66.7% of participants engaged in daily physical activity, with walking being the most popular choice. However, 14% did not engage in any physical activity for more than 30 minutes. Table 5.3 shows the participant’s level of physical activity.

Table 5

Participant Readiness Assessments

5.1 Participants' Stages of Change

Stages of Change	%	n=15

I have been to see a nutritionist and although I have already been discharged, I continue the nutritional recommendations I received, and I have incorporated them into my daily life.	40%	6
I have never been to a nutritional consultation, and I have not thought to go.	47%	7
I have never been to a nutritional consultation, but I'm thinking of going, within the next 6 months.	7%	1
I have a first appointment with the nutritionist.	7%	1
I went to the nutritionist in the last 6 months, and I have followed his/her recommendations.	0%	0
I attended my consultations with a nutritionist, and I have followed his/her recommendations for more than 6 months.	0%	0

5.2 Participant Responses to Motivation to Participate

Motivation to Participate	Participant Response
LEARNING	
	● I'm wanting to learn more about *nutrition* ● I could learn more information about *nutrition*. ● Learn how to eat *healthier* ● There's always something to be learned. ● Learn more ● To learn *nutritional facts* ● Learn new things ● It interested me ● It sounded like something I wanted to be a part of
HEALTH AND NUTRITION	
	● New page in my life...not motivated to eat *healthy* like normal ● For *nutrition* ● To sustain a way of taking care of myself and eating. ● To receive some *healthy* tips ● I have *health issues* due to food choices and life.
FAMILY	
	● To better educate myself for my family

5.3 Baseline of Physical Activity by Participant

Do you currently engage in P.A.?	%	n=15
Yes	67%	10
No	33%	5
What kind of P.A.?		
Cardio	7%	1
Cleaning, walking	7%	1
Indoor	7%	1
N/A	27%	4
Squats and jogging	7%	1
Walking	33%	5
Walking and Stairs	7%	1
Walking at least 2 blocks a day	7%	1
For how long?		
More than 30 min. everyday	40%	6
Less than 30 min. everyday	20%	3
Do not engage in any P.A. at the moment	27%	4
More than 30 min. more than once per week	13%	2

Note. The table displays the baseline of the participant's Physical Activity.

Intervention Assessment

This pilot study aimed to evaluate the impact of a trauma-informed nutrition intervention on enhancing six human-food interfaces in 15 perinatal BAAWs experiencing SUD. The study collected pre- and post-intervention data on family food habits, feelings and thoughts, food and nourishment, individual food habits, food skills, and personal nutrition habits to determine the potential impact of the intervention.

Table 6 summarizes findings from the evaluation of the trauma-informed nutrition education curriculum and provides insights into its effectiveness in improving six human-food interfaces in perinatal BAAW experiencing SUD. After the intervention, the results indicated a significant improvement in food skills ($P= 0.04$). Although the results observed in family food habits ($P= 0.86$), thoughts and feelings ($P= 0.67$), and food and nourishment ($P= 0.31$) were not

significant, these scores showed a slightly positive trend. The results in individual food habits (*P= 0.30*) slightly decreased while personal nutrition habits (*P= 0.29*) slightly increased from the pre-test to the post-test. The results suggest that due to the short duration of the pilot study, food skills change results in a quicker change, and long-term behavior changes take longer to develop before a significant impact can be measured.

Table 6

P-value Results for Six Human-Food Interface

Human-Food Interfaces	M Pre-Test	M Post-Test	P-value
Family Food Habits	3.58	3.60	.86
Feelings and Thoughts	3.14	3.24	.67
Food and Nourishment	3.97	4.13	.31
Individual Food Habits	3.75	3.29	.30
Food Skills	3.02	3.57	.04
Personal Nutrition Habits	1.60	1.77	.29

Note. The table displays the P values from the study results.

Discussion

The significance of trauma-informed care for pregnant women in SUD programs has been emphasized (Ballard et al., 2022; Mosley & Lanning, 2020). Studies have also explored the traumatic effects of COVID-19 on this population (Hall et al., 2021). Community-based programs providing wraparound services are essential, yet research on perinatal BAAW in SUD programs remains limited (White, 2023), especially in SUD treatment and recovery settings. It considers the impact of trauma on eating habits and health outcomes, moving away from solely attributing issues to individual choices (Resnicow & McMaster, 2012; Wall-Bassett et al., 2016).

This pilot study introduces a trauma-informed nutrition intervention, a concept with scarce evidence, focusing on the interplay between trauma and food behavior (Resnicow & McMaster, 2012; Wall-Bassett et al., 2016). Evidence-based research is scarce on how trauma-

informed nutrition education approaches can impact individuals. The study can offer the first glimpse into how these approaches can be implemented with BAAW in SUD community programs and healthcare settings. Trauma-informed nutritional intervention can empower healthcare providers to assess their perinatal clients' needs (especially those BAAW with SUD), decide which interventions would benefit their clients, plan appropriate actions, administer the chosen intervention(s), and reassess post-implementation. Trauma-informed nutrition interventions have the potential to promote healthier eating habits and address health disparities by providing nutrition education to perinatal BAAW and their infants, ultimately enhancing their recovery journey and inspiring a more nutritious future (Wall-Bassett et al., 2017; Wiss et al., 2021).

Specifically, the formative data shows that organizational support in implementing innovative interventions is essential. Based on the open-ended and multiple-choice questions, the organization's leadership was open to adopting the intervention. However, there was no specific long-term plan for the implementation or sustainability of the intervention. The findings indicate that nutrition education was valuable to the organization's wraparound services for perinatal BAAW. The organization was well-equipped and had all the resources, training, and education to offer these nutrition interventions, but it lacked funding. As a result, it relied solely on partnerships within the community to provide nutrition education. Despite these obstacles, enthusiasm for offering such services was evident among organizational leadership. Most participants believed these services were achievable within the range of their offerings and would cater to the fundamental necessities that lead to better health and well-being of perinatal BAAW. The initial results can be shared with experts and providers in the SUD field to spread knowledge and gain support for implementing trauma-informed nutrition interventions. The pilot

study provides baseline evidence of these practices' effectiveness in nutrition targeting perinatal BAAW with SUD and the need for such trauma-informed nutrition interventions. However, it also underscores the need for further research to fully comprehend and address the unique needs of this specific demographic, emphasizing the importance of the study's findings. These practices are necessary and can enhance patients' health in these settings (Brach & Fraser, 2000; Hall, 2021; White, 2023).

The individual readiness assessment revealed that seven out of fifteen participants had not sought nutrition counseling, while six actively followed nutritional advice. This indicates a growing interest in nutrition education, driven by a desire to improve health knowledge for their families. The study's results indicate a positive attitude about physical activity engagement, with many participants actively engaging in various forms of physical exercise, predominantly walking. Research has shown that people who engage in physical activity are more likely to practice other healthy behaviors. (Haslam et al., 2009). This finding of a positive attitude towards healthy habits is a promising indication of progress towards a healthier lifestyle and should be encouraging for the audience.

After the intervention, participants showed significant improvement in their food skills, which include the ability to prepare and cook food safely and nutritiously. Although broader behavioral changes may take more time, these findings indicate that the intervention can enhance food-related behaviors over an extended period. Even though none of the results on thoughts and feelings, food nourishment, food habits, and personal nutrition habits were statistically significant, all scores showed a positive trend. It is worth noting that these human-food interfaces questioned participants' perceptions of behavior improvement. However, since the intervention only consisted of five discussions, it may not have been enough time to alter an individual's

perception of behavior improvement. Overall, the study highlights the need for trauma-informed nutrition interventions targeting perinatal BAAW in SUD programs (Wall-Bassett et al., 2016; White, 2023).

Strengths and Limitations of Study

A strength of the study was the partnership between the PI and the leadership of the local CBO. The strong collaboration played a crucial role in enabling the successful execution of the intervention. The leadership's support was instrumental in ensuring the project's smooth implementation. Intervention delivery was regarded as a crucial component of wraparound services to the participants. As a result, intervention adoption increased, and the project was carried out efficiently. Another strength was that the PI conducted the research sessions exclusively, guaranteeing strict adherence and fidelity to the research protocol. Lastly, the pilot study results indicated that the intervention is feasible for implementation on a smaller scale. However, further research is necessary to comprehensively evaluate the potential for its more comprehensive application.

Several limitations were encountered while conducting the pilot study. The primary issue was caused by the COVID-19 pandemic, which resulted in a delay in the implementation and timeline of the study. Due to COVID-19 safety concerns, the original plan was revised to a phone-based delivery method. This change was made to ensure the safety of participants.

The study faced challenges with recruitment and small sample sizes, ultimately impacting its power and ability to generalize results. Additionally, the study's time constraints, which involved pregnant women or new mothers as participants, led to data collection delays as some participants could not continue with the intervention due to delivery dates or completing it post-birth. These time constraints were unforeseen and led to challenges in maintaining participation

levels. Self-selection or volunteer bias is a limitation because participants self-selected to participate, making it hard to get a representative sample, which can skew the data. Another limitation to be considered in this study is response bias, particularly about the vulnerability of the population being examined. It is crucial to assess potential response bias due to a lack of trust or discomfort in sharing information. These factors significantly impact the validity of the data.

The study's feasibility is limited due to potential challenges in staff support, which includes coordinating session timings and ensuring participant availability. These factors highlight the need for careful consideration and planning before replicating the study. Despite encountering several challenges, the pilot study served as a valuable pilot and yielded significant evidence that can be utilized for future research initiatives. The findings contribute to the existing literature on health disparities in perinatal BAAW who are in SUD recovery and suggest that trauma-informed nutrition education could significantly enhance current practices in communities of color.

Conclusion

This pilot study assesses providing trauma-informed nutrition education interventions to perinatal BAAW with SUD and evaluates organizational readiness, participant food interaction behavior, and readiness for intervention effectiveness. Findings showed that the organization was prepared to adopt innovative interventions, with participants also showing readiness to engage, which indicated a positive sign for adapting to change. The findings indicated a significant improvement in food skills after the intervention. Other outcomes show a slight improvement in family food habits, feelings and thoughts, and food and nourishment, but they were not statistically significant. These findings validate the potential effectiveness of an innovative nutrition education intervention founded on trauma-informed practices. The intervention

facilitates meaningful discussions and encourages participants to contemplate various food-related subjects. The study findings support that evaluating a person's readiness is crucial before implementing an intervention aimed at encouraging behavior change.

The intervention was designed to help individuals develop healthy eating habits by understanding the relationship between nutrition and food. By reflecting on personal experiences, individuals can potentially change their behavior. Encouraging questions and exploring childhood food experiences can lead to a healing process. This innovative trauma-informed approach can potentially reform how service providers deliver nutrition education messages by considering the individual's needs and employing trauma-informed practices. The pilot study's results can guide further research to support pregnant and postpartum BAAW with SUD. Integrating trauma-informed practices into nutrition education can potentially help address health disparities in this population.

Reflection

The pilot study examined a trauma-informed nutrition intervention for perinatal BAAW in SUD treatment. This study provides initial information on a new trauma-informed nutrition intervention approach, highlighting the lack of evidence-based research on its impact. The study provides insight into integrating approaches with BAAW in SUD community programs and healthcare settings. Trauma-informed nutritional intervention allows healthcare providers to assess perinatal clients' needs, decide on interventions, plan actions, implement interventions, and reassess post-implementation. Nutrition interventions with trauma-informed approaches have the potential to encourage healthier eating habits and tackle health inequalities by providing nutrition education to perinatal BAAW and their infants, ultimately improving their journey of recovery (Wiss et al., 2021; Wall-Bassett et al., 2016). The findings contribute to the literature on

health disparities in perinatal BAAW in SUD recovery. This suggests that trauma-informed nutrition education could enhance current practices in communities of color.

References

Baffour, T., & Chonody, J. (2009). African-American women's conceptualizations of health disparities: A community-based participatory research approach. *American Journal of Community Psychology*, *44*(3-4), 374–381. https://doi.org/10.1007/s10464-009-9260-xBaffour,

Ballard, J., Turner, L., Cuca, Y., Lobo, B., & Dawson-Rose, C. S. (2022). Trauma-informed home visiting models in public health nursing: An evidence-based approach. *American Journal of Public Health*, *112*(S3), S298–S305. https://doi.org/10.2105/AJPH.2022.306737

Brach, C., & Fraser, I. (2000). Can cultural competency reduce racial and ethnic health disparities? A review and conceptual model. *Medical Care Research and Review: MCRR*, *57 Suppl 1*(Suppl 1), 181–217. https://doi.org/10.1177/1077558700057001S09

Carr, D., & Springer, K. (2010). Advances in families and health research in the 21st century. *Journal of Marriage and Family*, *72*(3), 743-761. https://doi.org/10.1111/j.1741-3737.2010.00728.x

Centers for Disease Control and Prevention. *CDC Worksite Health ScoreCard: An Assessment tool to Promote Employee Health and Well-Being*. Atlanta: U.S. Department of Health and Human Services; 2019. https://www.cdc.gov/workplace-health-promotion/php/scorecard/index.html#:~:text=The%20CDC%20Worksite%20Health%20ScoreCard%20is%20a%20tool%20designed%20to,of%20chronic%20diseases%20in%20workers.

Damschroder, L. J., Aron, D. C., Keith, R. E., Kirsh, S. R., Alexander, J. A., & Lowery, J. C. (2009). Fostering implementation of health services research findings into practice: A

consolidated framework for advancing implementation science. *Implementation Science: 4*, 50. https://doi.org/10.1186/1748-5908-4-50

Ely DM, Driscoll AK. Infant Mortality in the United States, 2022: Data from the period linked birth/infant death file. National Vital Statistics Reports; vol 73 no 5. Hyattsville, MD: National Center for Health Statistics. 2024. https://dx.doi.org/10.15620/cdc/157006

Gonzalez-Ramirez, L., De la Roca-Chiapas, J., Colunga-Rodriguez, C., Preciado-Serrano, M., Daneri-Navarro, A., Pedroza-Cabrera, F., & Martinez-Arriaga, R. (2017). Validation of health behavior and stages of change questionnaire. *Breast Cancer (Dove Medical Press)*, *9*, 199–205. https://doi.org/10.2147/BCTT.S129855

Grant, L., Haughton, B., & Sachan, D. (2004). Nutrition education is positively associated with substance abuse treatment program outcomes. *Journal of the American Dietetic Association*, *104*(4), 604–610. https://doi.org/10.1016/j.jada.2004.01.008

Hall, S., White, A., Ballas, J., Saxton, S., Dempsey, A., & Saxer, K. (2021). Education in trauma-informed care in maternity settings can promote mental health during the COVID-19 pandemic. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *50*(3), 340–351. https://doi.org/10.1016/j.jogn.2020.12.005

Han, H., Miller, H. N., Nkimbeng, M., Budhathoki, C., Mikhael, T., Rivers, E., Gray, J., Trimble, K., Chow, S., & Wilson, P. (2021). Trauma-informed interventions: A systematic review. *PlOS ONE*, *16*(6), e0252747. https://doi.org/10.1371/journal.pone.0252747

Harvard Business School Online. (n.d.). *Organizational culture and leadership.* Harvard Business School. https://online.hbs.edu/blog/post/organizational-culture-and-leadership

Haslam, S., Jetten, J., Postmes, T., Haslam, C. (2009). Social identity, health and well-being: An emerging agenda for applied psychology. *Applied Psychology: An International Review, 58*(1), 1-23. https://doi.org/10.1111/j.1464-0597.2008.00377.x

Miller, W. R., & Rollnick, S. (2013). Motivational interviewing: Helping people change (3rd ed.). New York, NY: Guilford Press.

Mosley, E., & Lanning, R. (2020). Evidence and guidelines for trauma-informed doula care. *Midwifery*, *83*, 102643. https://doi.org/10.1016/j.midw.2020.102643

Oser, C., Harp, K., Pullen, E., Bunting, A., Stevens-Watkins, D., & Staton, M. (2019). African-American Women's Tobacco and Marijuana Use: The Effects of Social Context and Substance Use Perceptions. *Substance use & misuse*, *54*(6), 873–884. https://doi.org/10.1080/10826084.2018.1528464

Prochaska, J. O., & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Clinical Psychology*, *51*(3), 390-395. https://doi.org/10.1037/0022-006X.51.3.390.

Resnicow, K., & McMaster, F. (2012). Motivational interviewing: Moving from why to how with autonomy support. *The International Journal of Behavioral Nutrition and Physical Activity*, *9*, 19. https://doi.org/10.1186/1479-5868-9-19

Rodriguez de Lisenko, N., Gray, H., ,Bohn, J. (2022). Optimizing outcomes: A systematic review of psychosocial risk factors affecting perinatal Black/African-American women with substance use disorder in the United States. *Maternal and Child Health Journal*, *26*(10), 2090–2108. https://doi.org/10.1007/s10995-022-03503-5

Rogers M. (2002). Diffusion of preventive innovations. *Addictive Behaviors*, *27*(6), 989–993. https://doi.org/10.1016/s0306-4603(02)00300-3

Tilly, A., & Scott, W. (1987). Women, Work and Family (1st ed.). Routledge. https://doi.org/10.4324/9780203819395

Vilsaint, L., NeMoyer, A., Fillbrunn, M., Sadikova, E., Kessler, C., Sampson, A., Alvarez, K., Green, G., McLaughlin, A., Chen, R., Williams, R., Jackson, S., Alegría, M. (2019). Racial/ethnic differences in 12-month prevalence and persistence of mood, anxiety, and substance use disorders: Variation by nativity and socioeconomic status. *Comprehensive Psychiatry*, *89*, 52–60. https://doi.org/10.1016/j.comppsych.2018.12.008

Wall-Bassett, D., Robinson, A., Knight, S. (2016). "Moving Toward Healthy": Insights Into Food Choices of Mothers in Residential Recovery. *Global qualitative nursing research*, *3*, 2333393616680902. https://doi.org/10.1177/2333393616680902

White, K. (2023). *Introducing a trauma-informed care model to address racial disparities in perinatal outcomes among African American women* (Honors College Thesis No. 84). Wayne State University. https://digitalcommons.wayne.edu/honorstheses/84

Wiss, A., Russell, L., Prelip, M. (2021). Staff-perceived barriers to nutrition intervention in substance use disorder treatment. *Public Health Nutrition*, *24*(11), 3488–3497. https://doi.org/10.1017/S1368980020003882

Woods-Giscombé L. (2010). Superwoman schema: African American women's views on stress, strength, and health. *Qualitative Health Research*, *20*(5), 668–683. https://doi.org/10.1177/1049732310361892