HHS Public Access

Author manuscript

J Health Dispar Res Pract. Author manuscript; available in PMC 2023 July 01.

Published in final edited form as:

J Health Dispar Res Pract. 2022 ; 15(3): 66–82.

Motherhood Together: Effects of an Adapted Prenatal Curriculum on Mother and Infant Outcomes

Rebecca Lovan, MPH,
University of Arkansas for Medical Sciences

Clare C. Brown, PhD MPH,
University of Arkansas for Medical Sciences

Keneshia Bryant-Moore, PhD, APRN, FNP-BC,
University of Arkansas for Medical Sciences

Leslie McCormack, MSN, APRN, CNM,
University of Arkansas for Medical Sciences

Nicole Ward, PhD, APRN, WHNP-BC,
University of Arkansas for Medical Sciences

Shannon Kalkwarf, DNP, APRN, FNP-BC,
University of Arkansas for Medical Sciences

Beverly English, MNSc, RN, CPN,
University of Arkansas for Medical Sciences

Elizabeth Riley, DNP, PED-BC, RNC-NIC, CNE
University of Arkansas for Medical Sciences

Abstract

Background: Research shows that pregnant women experiencing housing insecurity are more likely to face barriers to prenatal care that can lead to negative health outcomes for both mother and infant. Previous studies have also shown that prenatal education programs provide pregnant mothers with the knowledge and resources that increase the likelihood of positive health outcomes. An interprofessional healthcare team in Central Arkansas modified an existing prenatal education program to create Motherhood Together, a program specifically tailored for pregnant women facing house insecurity.

Methods: The purpose of this initial evaluation of the Motherhood Together program was to identify the feasibility of the program and preliminary outcomes. This evaluation sought to better understand the demographic composition of the population participating in Motherhood Together (n = 19), as well as the effect of the program on infant outcomes, health literacy, and maternal self-care. The overall participant experience and feedback to enhance the program was also obtained.

* *Corresponding author:* Elizabeth Riley, eriley@uams.edu.

Results: The average age of participants was 24.6 years old and 77.8% reported high school as their highest level of educational attainment. The majority of participants identified as Black/African American (77.8%) and 22.2% identified as White. Participants scored the experience of Motherhood Together sessions positively with an overall score of 3.75/4.00. Participants reported an average gestational age at delivery being 36.9 weeks with 25% reporting preterm births following the program. Multivitamins were reported as being taken by 100% of participants following participation.

Conclusion: Tailoring the pre-existing educational program to create the Motherhood Together program was clearly feasible and continues to serve as a critical resource for improving equity in infant and maternal outcomes in central Arkansas.

Keywords

housing insecurity; infant; maternal health; pregnancy; prenatal education

INTRODUCTION

For many women, pregnancy can be an exciting time full of new discoveries and experiences, but for many it can also be a time of great uncertainty and fear. This uncertainty and fear are often worsened for many women who also face financial and housing insecurities, low health literacy, mental health concerns, food insecurity, and other confounding health problems. Health care professionals must consider the multitude of potential barriers that pregnant women may face to provide full and inclusive support for their patients throughout pregnancy and postpartum.

Background

Housing Insecurity.—Thousands of individuals in the United States experience housing insecurity every day. The term “housing insecurity” captures a broad range of individuals with unstable housing circumstances, including homelessness, difficulty paying rent, overcrowding, frequently moving, living with relatives or friends, or spending the majority of household income on housing (Office of Disease Prevention and Health Promotion [ODPHP], n.d.-a). Approximately 2,717 Arkansans experienced homelessness on a single given night in January 2019 (United States Interagency Council on Homelessness [USICH], n.d.). Housing insecurity can impact people from many backgrounds, including pregnant women and women who were recently pregnant. Approximately 8.1% of pregnant women in Little Rock, AR, the state’s capital and largest city, reported being housing insecure (Cutts et al., 2015). Additional evidence reports that about 4% of women who become pregnant have housing insecurities within one year of giving birth (Richards et al., 2011). Pregnant women who experience housing insecurity are more likely to be unmarried, uninsured, and have lower educational attainment (Richards et al., 2011; Do et al, 2018). They are more likely to be Black or Hispanic, under or overweight, and be between the ages of 16 to 19 (Richards et al., 2011; Do et al., 2018; Azarmehr et al., 2018). Women who experience housing insecurity also face various psychosocial barriers such as fear or anxiety, lack of problem-solving skills, lack of healthy coping skills, depression, and feeling overwhelmed with life circumstances (Azarmehr et al., 2018).

Housing insecurity results in a number of stressors that may impact pregnant women, including facing a high prevalence of secondhand tobacco exposure, limited access to health care, and unpredictable stress associated with housing insecurities (Porter et al., 2011). Many of these women additionally face significant logistical barriers including economic hardships, lack of transportation and lack of access to prenatal care (Azarmehr et al., 2018). While these factors individually may pose an increased risk during pregnancy, when combined they can lead to significant negative health outcomes for both mother and infant (Cutts et al., 2015).

Homelessness and housing insecurity during pregnancy have been linked with multiple adverse health outcomes for both the infant and mother. Two of the most common adverse health effects linked with housing insecurity during pregnancy include low birth weight (defined as a delivery weight less than 2,500 grams) and preterm delivery (defined as a delivery before 37 weeks' gestation) (Cutts et al., 2015; Richards et al., 2011; Azarmehr et al., 2018; Woods & Chesser, 2015). There have been multiple factors that may contribute to increased rates of adverse infant outcomes among infants born to women who are experiencing housing insecurity. Housing insecurity is associated with an increased rate of inadequate prenatal care, which can ultimately contribute to developmental disability disorders, diminished fetal growth, and even newborn death (Richards et al., 2011; Azarmehr et al., 2018; Woods & Chesser, 2015). Routine prenatal care is essential for healthy pregnancies as it allows healthcare providers to identify and manage preexisting comorbid medical conditions, treat comorbid conditions that are new as a result of pregnancy, and address behavioral factors (e.g., smoking or alcohol use) associated with negative health outcomes (Heaman et al., 2008). It is recommended that pregnant women attend their first prenatal visit during their first trimester and then continue routine care throughout their pregnancy (Heaman et al., 2008). Women who experience housing insecurity are additionally more likely to continue to smoke during their pregnancy (Do et al., 2018). Research has indicated that pregnant women with housing insecurities are more likely to have inadequate use of multivitamins and folic acid, which can contribute to poor fetal growth and development (Richards et al., 2011). Housing insecurity during pregnancy is also associated with behaviors after delivery, including lower rates of breastfeeding initiation and shorter duration of breastfeeding, which are also linked to poor infant growth and development (Richards et al., 2011).

As for maternal outcomes, housing insecurity during pregnancy has been linked with increased rates of infection and poor maintenance of chronic conditions, which can lead to an increased risk of malnutrition and anemia for the mother (Azarmehr et al., 2018). When compared to women without housing insecurities, pregnant women with housing insecurities experienced longer delivery hospital stays and risk for postpartum complications, such as postpartum hemorrhage and anemia (Azarmehr et al., 2018). Research has shown that community-based, multidisciplinary efforts were most appropriate for addressing the many unique needs of the housing insecure population and improving maternal and infant health outcomes (Woods & Chesser, 2015; Azarmehr et al., 2018).

March of Dimes – Becoming a Mom

The March of Dimes (MOD) foundation was created to improve the health and wellbeing of infants by preventing birth defects, preterm births, and infant mortality (Kaur et al., 2019). Through their work, MOD is developing and supporting programs and policies that benefit all mothers and infants regardless of age, socio-economic background, or other demographics (MOD, n.d.-b). Becoming a Mom© is a comprehensive prenatal education program developed by MOD to support healthy pregnancies by promoting healthy lifestyles and providing tools to manage and prepare for pregnancy, labor and delivery, and the postpartum period. The program is taught over nine sessions with each session focusing on a health-related aspect of pregnancy, delivery, or postpartum (MOD, 2015). The nine sessions include You and Your Pregnancy, Prenatal Care, Eating Health during Pregnancy, Stress during Pregnancy, Things to Avoid During Pregnancy, The Big Day: Labor and Birth, Caring for Your Baby, Postpartum Care, and Graduation and Baby Shower. Each session is designed to help women have a healthy pregnancy and prepare them for the new challenges of motherhood (MOD, n.d.-a). The Becoming a Mom© program can be presented in a variety of settings and is offered in both English and Spanish (Kaur et al., 2019).

Evaluations of the Becoming a Mom© program suggest that the curriculum has led to improved prenatal knowledge and increased positive health behaviors for participants. The Texas Chapter of March of Dimes evaluated the Becoming a Mom© program across 13 different sites in 2018 (Kaur, et al. 2019). The pre- and post-test data indicated a significant difference between participant knowledge concerning infant sleep posture and breastfeeding, as well as a 20% decrease in the frequency of tobacco use during pregnancy (Kaur, et al., 2019). Another evaluation of the Becoming a Mom program was conducted by the Greater Kansas Chapter of March of Dimes in 2015 (Woods & Chesser, 2015). Results from this program evaluation showed that women participating in the program had significant increases in knowledge related to health behaviors that have been associated with infant mortality, as well as increased knowledge regarding the hazards of tobacco use (Woods & Chesser, 2015). Additionally, the program was shown to increase the percent of pregnant and postpartum women who received prenatal education (Woods & Chesser, 2015). Overall, the Becoming a Mom program has been shown to be an effective tool in increasing desired health outcomes among pregnant women and their infants, as well as generally increasing access to prenatal education.

Motherhood Together

Although the Becoming a Mom© program has been shown to be effective in improving maternal outcomes and increasing prenatal education, it is designed for the general population and therefore fails to address many unique problems faced by more specific, vulnerable populations such as women facing housing insecurity. As a result, the Motherhood Together program was developed to better address the unique needs and health disparities faced by pregnant women with housing insecurities. The program is based on the Becoming a Mom© curriculum but has been adapted to include access to social services and resources for homeless and near-homeless pregnant women, as well as expanded modules to provide additional education on topics unique to this population. An iterative process was conducted to adapt the curriculum to appropriately meet the needs of the population.

This included obtaining feedback from women representing the target population on the Becoming a Mom© curriculum. This was a structured process to gain insight on the information and topics provided in the curriculum, readability, and their ability to relate to the program. Additionally, university nursing and public health faculty reviewed the curriculum based upon clinical experience and expertise. Lastly, the feedback obtained from each participant cohort was integrated. The curriculum consists of ten sessions including Getting to Know you/Pregnancy Overview, Things to Avoid in Pregnancy and Stress, Prenatal Care, Big Day/Postpartum Overview, Birth Plan, Postpartum, Baby Safety Shower, Breastfeeding/Bottle Feeding, Infant Care, and Infant CPR (Table 1). The Motherhood Together sessions take place outside of clinic hours at the university's student-led health and wellness center, a community health clinic operated by a university in central Arkansas. Sessions are facilitated by employees and students from various colleges (e.g., Nursing, Medicine, Public Health) who have been trained to present the materials. The program offers a unique interprofessional opportunity for students from multiple disciplines to be involved by teaching, providing instructor support, and assisting participants with childcare during the sessions. To date, the program has trained 33 students on the Motherhood Together curriculum, with 29 students having volunteered at one or more sessions.

The sessions are designed to be educational but also inclusive and flexible. Each session begins with an opportunity for group discussion where participants can reflect on the previous session, the topics for the current session, or any questions and concerns they may have about their pregnancy or quality of life in general. After introductory discussion, the session leaders lead an activity, such as a relaxation exercise or some other activity to allow the women to relax and prepare to focus on the session content. The session leaders, or in some cases a guest speaker, then present the session content for the day allowing ample opportunities for participant discussion and engagement. Each session has built-in discussion topics, handouts, activities, and other learning aids to help present and communicate the information to the participants. At the end of each session, the leaders guide the participants through a reflection of the day's content and allow opportunities for any lingering questions or comments.

In addition to adapting the program content, Motherhood Together has initiated and integrated many key services and resources for program participants. Because lack of transportation has been shown to be a major barrier for the target population, Motherhood Together program leaders work with each participant to ensure all participants have adequate transportation to and from each session, by using rideshare services, such as Uber. Additionally, the participants are provided a meal at each session to help offset food insecurity and allow for greater focus on the day's topic. Any leftover food is then packaged and sent home with the participants.

Another way Motherhood Together addresses the unique needs of the target population is by allowing participants to bring their children with them to the sessions. There is not a formal childcare program included in the sessions, but the student-run health clinic has a play area with books and toys for children, and program volunteers help watch the children while the mothers attend the sessions. As many of the participants have limited financial resources, the program works to provide each participant with supplies like diapers, baby soap and lotion,

and portable cribs (such as Graco's pack n' play) throughout the program. Session leaders also help connect women to local resources to obtain car seats and booster seats for their infant and other children. Additionally, program participants are visited in the hospital by program staff after delivery and given a gift basket full of items to help with the transition into postpartum and motherhood. Motherhood Together seeks to increase prenatal education among program participants but also to address and alleviate many of the unique challenges faced by the population it serves.

METHODS

The purpose of this initial evaluation of the Motherhood Together program was to identify the feasibility of the program and preliminary outcomes. Because the program has only completed three cohorts and is still being adapted, this evaluation is designed to broadly assess characteristics of the program's enrollees and general outcomes rather than an in-depth analysis of participant outcomes. This evaluation seeks to answer the following questions:

- What is the demographic composition of the population participating in the Motherhood Together program?
- What effect has the program had on infant outcomes and maternal confidence, knowledge, and health literacy?
- What improvements could be made to the Motherhood Together program?
- What improvements at the university medical center could be made to better support the housing insecure population and the Motherhood Together program?

Various forms of data were collected and descriptively analyzed to help answer these questions. The first data set included intake packets completed by each participant at their initial program session. The intake packets include a broad array of questions covering background demographic factors, information on their current pregnancy and pregnancy history, beliefs about substance use, use of pregnancy prevention, dental symptoms, tobacco use, and various social needs. The intake packets were entered into a spreadsheet and then reviewed to develop a sense of the program's population demographics and needs. The second set of data was comprised of session sign-in sheets and evaluation forms, which were both completed at every session. The sign-in sheets were analyzed for trends in program participation, and the evaluation forms were used to gather the participants' overall perceptions of the program.

In addition to reviewing data collected over the course of the program, follow-up interviews were completed with each participant to gather data on health outcomes and assess any changes in health literacy, knowledge, and beliefs. The follow-up interviews consisted of questions about the participant's pregnancy, delivery and postpartum experience, current tobacco use and exposure, health literacy, stress and depression, and their experience in the Motherhood Together program. The interview included questions about how the program impacted the participants as well as general feedback on their experience in the program. All interviews were completed over the phone and lasted about 10 minutes each. Phone

numbers were available for 18 out of the 19 program participants; however, many of the phone numbers were incorrect or no longer in service, which contributed to a low rate of completion. Among the 11 phone numbers that were correct and working, 9 of 11 interviews were completed. Each interview was completed over the phone using a script and interview guide, and participants were directed to ask for clarification as needed. The results of completed interviews were compiled in a spreadsheet and analyzed for associations. Additionally, the interview data were compared to the participant intake packets to identify any changes in behavior or beliefs and to assess overall outcomes. An overview of the results from the data collection and review are outlined in the following sections.

RESULTS

To improve clarity, findings are presented separately as data collected at baseline and data collected post-intervention. Baseline data were collected from the participants' intake packets, which were completed by 18 of the 19 program participants before their first program session. Post-intervention data were collected from participants' sign-in sheets and session surveys completed at each session, as well as data collected during telephone follow-up surveys. Follow-up surveys were completed with 9 of the 19 program participants.

Baseline Data Collected at the Start of the Program

Motherhood Together Participant Demographics.—The average age of program participants was 24.6 years old, with 38.9% of participants aged 18 to 20 and 27.8% of participants aged 26 to 30. The majority of program participants reported high school as their highest level of completed education with 77.8% completing high school or less, 5.6% completing some college, and 16.7% graduating college with an associate's or bachelor's degree. A little less than half (44.5%) of the women reported any level of current employment, and almost all of the women reported they were single or never married (94.4%). The average household size reported was 3.1, and 50% of women reported they had other children. The program included 77.8% Black women and 22.2% White women. Lastly among the 17 women who noted their insurance coverage, 76.5% of women reported Medicaid as their primary health insurance, 11.8% reported private insurance, and another 11.8% reported having no insurance or a different public coverage (Table 2).

Pregnancy History & Health Status.—Intake data were assessed for information regarding the participants' prior pregnancy history and current health status. Program participants reported an average of 1.7 previous pregnancies, with 33.3% of women reporting the current pregnancy as her first pregnancy. The average gestational age reported at intake was 24.8 weeks, and 5.6% of women reported a prior preterm delivery. Information regarding existing comorbid conditions was also collected with depression (44.4%), anemia (27.8%), and high blood pressure (22.2%) being the most frequently reported conditions. Additional reported conditions included asthma (16.7%) and diabetes (5.6%). About a quarter of program participants (22.2%) reported they had been told their pregnancy was high risk by their health care provider, and 61.1% reported they were taking prenatal or multi-vitamins. Lastly, at baseline, 88.2% of women reported an intention to breastfeed after delivery (Table 3).

Experience with the Healthcare System.—Intake data revealed that only around half (56.3%) of the women had completed their first prenatal visit by the time they enrolled in Motherhood Together. Additionally, 76.5% of participants reported any form of well visit within the past 12 months, and 31.3% reported that their last dental visit occurred over 12 months ago. Less than half (47.1%) of the program participants reported speaking with their physician about plans to prevent future pregnancy, while 66.7% of women reported they planned to use some form of contraception following pregnancy. Among women who planned to use any form of contraception, birth control patches and pills (38.9%), condoms (27.8%), and an IUD (10%) were the most commonly reported. Women additionally reported that they planned to use progesterone injections or Depo Provera (5.6%), the withdrawal method (5.6%), or tubal ligation (5.6%).

Financial, Social, & Emotional Needs.—To assess the unique needs of the program participants, questions regarding financial, social, and emotional needs were included in the intake packet. The majority of participants indicated that they had some form of financial difficulty. In fact, 70.6% of women reported that they had a hard time paying for basics like food, housing, medical care, and heating, and only 52.9% reporting they had reliable transportation. Many of the women reported some level of social engagement, with 83.3% reporting spending some amount of time each week with family and friends, as well as 83.3% who reported talking on the phone or in-person with family and friends for some amount of time each week. Regarding extracurricular activities, 55.6% of women reported attending church or religious services, and 61.1% reported attending meetings for clubs or organizations. Additionally, participants reported feelings of unsafety in their relationships (22.2%), where they were living (29.4%), and in their neighborhood (27.8%). Lastly, many of the program participants reported high levels of stress or depression at intake. Every participant reported experiencing at least some level of recent stress, and 70.6% of women reported experiencing little interest or pleasure in doing things at some point in the prior two weeks and 70.6% reported feeling down, depressed, or hopeless during this same time period (Table 4).

Health Literacy & Health Behaviors.—The last section of data collected in the intake packets addressed participant health behaviors and health literacy. At baseline, 44.4% of participants reported that they were ever smokers, with 87.5% of these women stopping prior to pregnancy or after discovering they were pregnant. Additionally, 38.9% of women reported they were exposed to some level of tobacco use in their home or car. Regarding health literacy, 33.3% of participants reported ever needing help reading hospital materials, and 47.1% reported a lack of confidence in filling out medical forms. Lastly, 35.3% of women reported some level of difficulty learning about their medical condition due to difficulty understanding written information.

Post-Intervention Data Collected at the End of the Program

Overall Participant Experiences.—Post-session participant survey scores regarding views of the program content and delivery were consistently positive. Response options ranged from 1 to 4, and overall scores for each question averaged 3.75 or above. The two highest-scoring questions included that the session met participant expectations (3.98) and a

rating of the participant's overall session experience (4.0). The lowest overall average score was 3.75 for the quality of food provided during the sessions. When looking at individual session average scores, only one session across all three program cohorts (i.e., a total of 26 sessions) had an average overall session experience score of less than 3.5. On average, program participants attended 5.8 out of 10 sessions, and 63% of participants attended enough sessions to graduate from the program. Out of the nine participants completing the follow-up survey, 88.9% reported that the Motherhood Together program helped them with their pregnancy, delivery, and/or transition into postpartum. Additionally, follow-up survey data revealed that 77.8% of respondents felt the program helped them manage their stress, and 66.7% reported a change in health habits as a result of participating in the program (Table 5).

Outcomes.—The data collected during the follow-up survey was also used to assess patient and infant outcomes. Of the nine participants that completed the follow-up survey, eight were postpartum and one was currently pregnant. Additionally, one of the eight postpartum participants reported that her child was stillborn. The average gestational age at delivery was 36.9 weeks, with 25.0% of respondents reporting preterm deliveries (less than or equal to 36 weeks' gestation). Although a quarter of reported births were preterm, only 12.5% reported a low birth weight of less than 2,500 grams. However, a quarter (25.0%) of respondents also indicated they experienced complications with delivery, and 14.3% reported their child was admitted to the neonatal intensive care unit. The average reported hospital stay for mothers and infants was between 2.25 and 2.50 days, and one infant stayed in the hospital for 31 days. The majority of respondents reported making some attempt at breastfeeding (85.7%) with 83.3% attempting within three hours of delivery. Additionally, only 28.6% reported they were still breastfeeding at the time of the follow-up survey. Every respondent also reported having health insurance at the time of delivery, with 77.8% reporting Medicaid coverage and 22.2% with private coverage.

Health Behaviors.—Follow-up data indicated that 100% of respondents reported taking prenatal or multivitamins during their pregnancy, and 88.9% reporting taking it five or more days each week. Only 66.7% of respondents reported they were currently using any form of contraception at the time of the follow-up survey. Of those using contraception, abstinence (66.5%), condoms (50.0%), and progesterone injections or Depo Provera (50.0%) were the most commonly reported. Additional reported forms of contraception include birth control patches or pills (33.3%) and tubal ligation (16.7%). Lastly, 33.3% of respondents reported using tobacco within 30 days before the follow-up survey, and 22.2% reported they were exposed to some level of tobacco in their home or car.

Health Literacy & Emotional Needs.—The final section of follow-up survey data addressed health literacy and emotional needs to assess for any changes from baseline. According to the follow-up survey data, 22.2% of participants reported ever needing help reading hospital materials and 44.4% reported a lack of confidence in filling out medical forms. Lastly, 33.3% of women reported some level of difficulty learning about their medical condition due to difficulty understanding written information. As for emotional needs, less than half (44.4%) of survey respondents reported experiencing any level of recent

stress. However, over half (66.7%) reported recently experiencing little interest or pleasure in doing things, and 55.6% reported recently feeling down, depressed, or hopeless (Table 6).

DISCUSSION

Participant Demographics

Housing insecurity during pregnancy is associated with many demographic factors that may contribute to increased health risks during pregnancy, such as being unmarried, uninsured, having lower educational attainment, being of Black race, and younger age (Richards et al., 2011; Do et al., 2018; Azarmehr et al., 2018). Additionally, housing insecurity during pregnancy has been associated with secondhand smoke exposure, a lack of reliable transportation, financial hardships, and high levels of stress and depression (Porter et al., 2011; Azarmehr et al., 2018). Several of these demographic factors were represented in the Motherhood Together population. Many of the program participants reported being unmarried, completing high school or less, being Black/African American, lacking reliable transportation, facing financial hardships, and experiencing some level of stress or depression. However, several factors varied from prior research. The majority of program participants reported they were insured by Medicaid at intake, between the ages of 18 and 20, and had no secondhand smoke exposure. The high rates of Medicaid insurance coverage among the program population may be attributed to the fact that low-income pregnant women with incomes at or below 200% of the federal poverty level are eligible for Medicaid coverage. Additionally, it should be noted that data regarding tobacco use and exposure was self-reported and is therefore subject to potential bias. Because the Motherhood Together program is being adapted from an existing curriculum to better serve pregnant women with housing insecurity, it is important to understand the background of the program population and the unique challenges they may face. Currently, the program is still growing, therefore this data only represents a small portion of this population. As a result, thorough surveillance efforts should be replicated with future cohorts to develop a better understanding of the participant population and continue adapting the program.

Health Outcomes & Health Behaviors

A review of existing literature revealed several adverse health outcomes associated with housing insecurity during pregnancy. The most commonly reported being low birth weight, preterm delivery, and increased hospital stays (Cutts et al., 2015; Richards et al., 2011; Azarmehr et al., 2018; Woods & Chesser, 2015). While the Motherhood Together program is still new and has a limited sample pool many of these health outcomes were not reported by program participants during their follow-up survey. The majority of women reported normal birthweights with only 12.5% of participants reporting their infants were born weighing less than 2,500 grams and over half of the participants reported delivering after 37 weeks' gestation with 22.2% of infants being born preterm. However, compared to the 2020 report by the National Vital Statistics System-Natality, Motherhood Together participants had higher rates for low-birth weights (8.3% compared to 7.8% national average) and preterm deliveries (9.9% compared to 9.4% national average) than the provisional rates in the United States (ODPHP, n.d.-b; ODPHP, n.d.-c). Additionally, the majority of participants noted typical hospital stays following delivery with 77.8% of mothers and 55.6% of infants staying

three days or less. While it is too early to draw any conclusions regarding the causal impact of Motherhood Together on health outcomes, initial data seems to show positive trends among participant outcomes. Although a formal comparison of program participant and non-participant outcomes is needed to truly assess the impacts of Motherhood Together on health outcomes.

In addition to other factors, there are many health behaviors associated with pregnant women with housing insecurity that can contribute to negative health outcomes. Existing literature has linked housing insecurity during pregnancy with behaviors, such as the inadequate use of prenatal vitamins, continued use of tobacco products during pregnancy, lower rate of breastfeeding initiation, and shorter duration of breastfeeding (Do et al., 2018; Richards et al., 2011). These health behaviors are commonly associated with poor fetal development and growth, which can continue into infancy (Do et al., 2018; Richards et al., 2011). Motherhood Together data only showed evidence of two of these behaviors among current participants, which were a low rate of breastfeeding initiation and shorter duration of breastfeeding. A little over half of the participants reported they had attempted breastfeeding following delivery and less than a quarter were still breastfeeding at the time of their follow-up survey. As for the other associated health behaviors, only 12.5% of women reported using tobacco products during their pregnancy and at follow-up, every participant reported taking prenatal vitamins during their pregnancy. These differences between the literature regarding tobacco use and prenatal vitamin use among housing insecure pregnant women may be attributed to the program's educational content surrounding the topics. Additionally, these changes may be the result of social learning that naturally occurs in a group setting such as the Motherhood Together sessions. As the participants become more involved with the Motherhood Together program, they not only receive continuous messages about positive health behaviors during pregnancy, but they also observe them among their peers. Again, this data is limited by the number of current program participants and may change as future data is collected. As more participants complete this program data collection efforts must be continued in order to gain a better understanding of the behavioral needs of program participants and uncover the true impacts of the Motherhood Together program.

Improvements to Motherhood Together Program & Potential Program Support

Overall, the program participants provided positive feedback during their follow-up surveys regarding Motherhood Together. Almost all of the participants reported that the program helped them with their pregnancy, delivery, and/or transition into postpartum. Additionally, over half of the participants reported that the program helped them manage their stress and emotions, as well as change their health habits. However, in the population evaluated in this program, depression appeared to be a more frequent issue than stress. While the adapted curriculum is seemingly having a positive impact on the program participants it is important to recognize that it is still early in the program's implementation, and there is plenty of room for growth and improvement. After reviewing the collected program data, the following topics seem most appropriate for additional development, as well as potential avenues to provide program support: breastfeeding, contraception, mental health, and post-program support.

During follow-up interviews, many of the participants reported a low rate of breastfeeding initiation and short breastfeeding duration. While many factors can impact this behavior, this may be an appropriate place to provide additional education or support to program participants. However, more cohorts will be needed to gauge any educational effects on breastfeeding behavior. Another option for addressing this behavior could be through providing support to participants in the hospital following delivery as well as once they have discharged home. Of those that reported attempting breastfeeding, around half reported doing so within three hours after delivery. This would suggest that continued efforts may be needed after the initially provided postpartum support in order to support and encourage women to continue breastfeeding. Perhaps this presents an opportunity to change the way lactation support is provided to recently postpartum mothers. could include options for lactation counseling during routine postpartum medical visits or perhaps develop a helpline for women to contact with any questions or concerns. In fact, these services could be offered through an existing provider support service, ANGELS (Antenatal and Neonatal Guidelines, Education, and Learning System).

Another area for improvement within the Motherhood Together program is the general use of contraception following delivery and the efficacy of the methods used. A little over half of the program participants reported currently using any form of contraception at follow-up, and the methods used abstinence, condoms, and Depo Provera were the most commonly reported. The use of contraception is essential as it is the only way to effectively safeguard against future undesired pregnancies. As with breastfeeding, many factors can impact a woman's decision to use contraception including education and access to care. The Motherhood Together program currently presents a module on contraception so perhaps over time, additional data will show an increased use of contraception among cohort members. However, it may be beneficial to provide supplemental assistance regarding contraception alongside the program module, such as an option for prenatal care during sessions. Providing an option for prenatal care alongside program sessions eliminates many barriers for program participants and offers them opportunities to discuss contraception at earlier stages in their pregnancy. Establishing this conversation early on would allow participants to ask their medical providers questions about their contraception options and create a well-formed plan for beginning contraception after delivery.

Mental health support is another area for the Motherhood Together program to expand and improve. Although 77.8% of program participants reported that Motherhood Together helped them manage their stress and emotions, at follow-up over half of the program participants reported recently feeling little interest or pleasure in doing things and feeling down, depressed, or hopeless. To better address the mental health needs of the program participants, it is important that the Motherhood Together facilitators lead open conversations about mental health. Mental health is a topic shrouded in stigma, which unfortunately discourages many individuals from seeking care and disclosing their symptoms. Additionally, mental health conditions can take many different forms, so program participants must understand their symptoms and know how to identify problem signs before they get out of hand. This is also a great opportunity to integrate their services into the Motherhood Together sessions. The Psychiatric Research Institute is a premier mental health facility in the area that provides mental health care to women, children, and

adults with 40 inpatient beds and multiple outpatient services. The Psychiatric Research Institute houses the Women's Mental Health Program, which is dedicated to providing mental health support to women, especially during pregnancy and to postpartum women. Perhaps the Women's Mental Health Program could attend various Motherhood Together sessions to be available to provide services to participants as needed, or more simply promote their services within the program. As mentioned with contraception use, allowing providers to be present during the program session would eliminate many barriers for participants and present opportunities to get much-needed care.

The final area identified for potential program development within the Motherhood Together program is the lack of support for participants following their involvement in the program. In completing follow-up interviews with program participants, many of the women endorsed a desire to return to the program. Program participants reported that they greatly enjoyed the social connectivity provided by the program and the ability to share and learn from other women in similar situations. Although Motherhood Together is not intended to be a long-term program, there seems to be a great desire among program participants to maintain the connections they made during the program. It is not realistic to expect the Motherhood Together program to continue long-term support or a social group for program participants, but perhaps this is a great opportunity to involve existing community partners that offer long-term housing and social supports. By working with a community partner, Motherhood Together could establish a support group for previous program participants to stay connected and support each other during the postpartum period. This support group could also provide opportunities for participants to continue learning about motherhood, accessing vital resources, or receiving medical care, thereby further increasing positive health outcomes among a vulnerable population.

Limitations

This program evaluation is not without limitations. Perhaps the greatest limitation to the findings of this evaluation was the population size of both the program participants and the follow-up survey participants. The number of overall participants was low simply due to the age of the program; population numbers will naturally increase over time as more cohorts are completed. As for the number of follow-up survey participants, this number was greatly impacted by the lack of valid contact data for program participants. Future cohorts should verify contact information routinely or at least at graduation to ensure accurate data is maintained. Another limitation of the current program evaluation includes the lack of consistency across cohort curriculums. Because the curriculum was being adapted as it was taught these initial cohorts each received a slightly different lesson plan. Now that a finalized adapted curriculum exists, it will be important to continue data collection going forward to more appropriately assess program outcomes. Lastly, some of the findings in this evaluation were limited by participant health literacy and general knowledge. In reviewing data collected through the program intake packets it was clear that several questions were potentially misunderstood by participants and therefore answered inaccurately. For future cohorts, it is advised that program leaders review intake packets when they are submitted and clarify any inconsistencies or blank fields to ensure accurate data collection.

CONCLUSION

Overall, the Motherhood Together program has received positive feedback to date. Previous program participants have provided positive feedback and rankings regarding both individual program sessions and the entire program. Additionally, the target population for the program clearly exists and needs services as evidenced by existing program data. However, further data collection and evaluation are needed to fully assess the health impacts of the Motherhood Together program and to evaluate the program with a control population. Although for now, the Motherhood Together program offers much-needed services and an abundance of support to a vulnerable population.

ACKNOWLEDGEMENTS

The project described was partially supported by the Translational Research Institute (TRI), grant [U54 TR001629] through the National Center for Advancing Translational Sciences of the National Institutes of Health (NIH). The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH. Additional funding was received from the Health Resources and Services Administration (HRSA) Maternal and Child Health Public Health Catalyst Program (Grant# T1CMC35359), UAMS Interprofessional/ Interdisciplinary Small Grant and the Natural Wonders Innovation Fund: Translating Ideas into Action U54 TR001629. We would also like to acknowledge March of Dimes and Arkansas Children's Hospital for donation of supplies and giveaway items for participants.

REFERENCES

Azarmehr H, Lowry K, Sherman A, Smith C, & Zuñiga J (2018, December). Nursing practice strategies for prenatal care of homeless pregnant women. Nursing for Women's Health, 22(6), pp. 489–498. DOI: 10.1016/j.nwh.2018.09.005

Cutts D, Coleman S, Black M, Chilton M, Cook J, de Cuba S, Heeren T, Meyers A, Sandel M, Casey P, & Frank D (2015, June). Homelessness during pregnancy: A unique, time-dependent risk factor of birth outcomes. Maternal and Child Health Journal, 19(6), pp. 1276–1283. DOI: 10.1007/s10995-014-1633-6 [PubMed: 25404405]

Do E, Green T, Prom-Wormley E, & Fuemmelera B (2018, October 28). Social determinants of smoke exposure during pregnancy: Findings from waves 1 & 2 of the Population Assessment of Tobacco and Health (PATH) study. Preventive Medicine Reports, 12, pp. 312–320. DOI: 10.1016/j.pmedr.2018.10.020 [PubMed: 30406010]

Heaman M, Newburn-Cook C, Green C, Elliott L, & Helewa M (2008, May). Inadequate prenatal care and its association with adverse pregnancy outcomes: A comparison of indices. BMC Pregnancy and Childbirth, 8(15), pp. 1–8. DOI:10.1186/1471-2393-8-15 [PubMed: 18179721]

Kaur R, Gandhi H, & Oloyede T (2019, May). Texas Becoming a Mom/Comenzando bien: 2018 prenatal education program evaluation.

March of Dimes. [MOD]. (n.d.-a). Prenatal education and outreach. https://www.marchofdimes.org/mission/prenatal-education-and-outreach.aspx

March of Dimes. [MOD]. (n.d.-b). Who we are. https://www.marchofdimes.org/mission/who-weare.aspx

March of Dimes. [MOD]. (2015). Becoming a Mom handouts. https://www.marchofdimes.org/materials/Becoming-a-mom-handouts-2015.pdf

Office of Disease Preventions and Health Promotion. [ODPHP]. (n.d.-a). Housing instability. https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinant-shealth/interventions-resources/housing-instability

Office of Disease Prevention and Health Promotion. [ODPHP]. (n.d.-b). Maternal, infant, and child health: MICH-9.1 reduce total preterm birth. https://www.healthypeople.gov/2020/data-search/Search-the-Data#objid=4906

Office of Disease Prevention and Health Promotion. [ODPHP]. (n.d.-c). Maternal, infant, and child health: MICH-8.1 reduce low birth weight. https://www.healthypeople.gov/2020/data-search/Search-the-Data#objid=4903

Porter J, Houston L, Anderson R, & Maryman K (2011, November). Addressing tobacco use in homeless populations: Recommendations of an expert panel. Health Promotion Practice, 12(6 Suppl 2), 144S–151S. DOI: 10.1177/1524839911414412 [PubMed: 22068577]

Richards R, Merrill R, & Baksh L (2011, September). Health behaviors and infant health outcomes in homeless pregnant women in the United States. Pediatrics, 128(3), 438–446. DOI: 10.1542/peds.2010-3491 [PubMed: 21824881]

United States Interagency Council on Homelessness. [USICH]. (n.d.). Arkansas homelessness statistics. https://www.usich.gov/homelessness-statistics/ar/

Woods N, & Chesser A (2015). Becoming a Mom: Improving birth outcomes through a community collaborative prenatal education model. Journal of Family Medicine and Disease Prevention, 1(1). https://clinmedjournals.org/articles/jfmdp/jfmdp-1-002.pdf

Table 1.

Weekly Outline for Motherhood Together vs Becoming a Mom©

Motherhood Together Curriculum	Becoming a Mom Curriculum©
Week #1 – Getting to know you, pregnancy overview, nutrition	Session 1: You and Your Pregnancy
Week #2 – Things to avoid in pregnancy and stress	Session 2: Prenatal Care
Week #3 – Prenatal care	Session 3: Eating Healthy During Pregnancy
Week #4 – Big day/Postpartum overview (may bring partner)	Session 4: Stress During Pregnancy
Week #5 – Birth plan, big day review, immediate hospital postpartum	Session 5: Things to Avoid During Pregnancy
Week #6 – Postpartum depression, postpartum changes, warning signs, birth control	Session 6: The Big Day: Labor and Birth
Week #7 – Breastfeeding, bottle feeding, formula, milk storage	Session 7: Caring for Your Baby
Week #8 – Baby safety shower; Infant CPR	Session 8: Postpartum Care
Week #9 – Couplet care/bonding, infant and day care	Session 9: Graduation and Baby Shower!
Week #10 – Graduation	

Table 2.

Demographic Data of Participants

Age	Education	Employment	Marital Status	Race	Insurance
Mean = 24.6 years	77.8 % ≤High school	44.5 % Employed	94.4 % Never married	77.8 % Black	76.5 % Medicaid
38.9 % Age 18–20	5.6 % Some college	55.5 % Unemployed	5.6 % Married	22.2 % White	11.8 % Private
22.2 % Age 21–25	16.7% College grad.				11.8 % No coverage or no response
27.8 % Age 26–30					
11.1 % ≥ Age 30					

Table 3.

Baseline Intake Data: Prior Pregnancy and Current Health Status

Pregnancy	Gestational Age at Intake	Prior Preterm Delivery	Existing Comorbid Conditions	First Prenatal Visit Completed
Mean = 1.7 previous preg.	24.8 weeks	5.6 % Yes	44.4 % Depression	56.3 % Yes
33.3 % 1st pregnancy		94.4 % No	27.8 % Anemia	43.7 % No
			22.2 % Hypertension	
			16.7 % Asthma	
			5.6 % Diabetes	

Table 4.

Financial, Social, & Emotional Needs Pre-Education

Financial Difficulty	Reliable Transportation	Social Engagement	Unsafety
70.6 % Yes	52.9 % Yes	83.3 % Yes	22.2 % Relationships
29.1 % No	47.1 % No	16.7 % No	57.2 % Home/Neighborhood

Table 5.

Participant Evaluation of Educational Sessions Post-Education

Question	Score*
Please rate your overall experience	3.98
Quality of food	3.75
The session met your expectations	3.98
Room set-up and comfort	3.97
Discussion and usefulness	3.94
Information presented useful	3.95
Quality of written materials and handouts	3.92
Quality of visual and instructional material	3.89
Presenter's knowledge/expertise on the topic	3.95
	Percentage
Perceived impact	
Helped with pregnancy, delivery, and post-partum	88.9 %
Helped to manage stress and emotions	77.8 %
Change health habits	66.7 %

*Scores out of 4.00 total

Table 6.

Participant Outcomes: Pre- and Post-Education

Outcome	Pre-Education	Post-Education
Prenatal vit. use	61.1 %	100 %
Contraception	66.7 %	66.7 %
Stress Level	99.4 %	44.4 %
Depression	66.7 %	55.6 %
Tobacco Exposure	27.8 %	27.7 %
Health Literacy		
Help reading hospital materials	33.2 %	22.2 %
Lack of confidence filling out medical forms	44.4 %	44.4 %
Difficulty learning about medical condition	33.3 %	33.3 %