frontiers | Frontiers in Environmental Health

TYPE Community Case Study
PUBLISHED 06 January 2026
DOI 10.3389/fenvh.2025.1731907

OPEN ACCESS

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RECEIVED 24 October 2025
REVISED 01 December 2025
ACCEPTED 01 December 2025
PUBLISHED 06 January 2026

CITATION
Harville EW, Giarratano G, Patterson M, Schultheis M, Dorans KS, Turner S, Harris S, Longo S and Weis K (2026) M-O-M-S on the Bayou: implementation of an intervention to improve mental health after disaster.
Front. Environ. Health 4:1731907.
doi: 10.3389/fenvh.2025.1731907

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M-O-M-S on the Bayou: implementation of an intervention to improve mental health after disaster

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Pregnant women are a vulnerable population after disaster. Their health may be improved through community-based support programs in addition to their standard prenatal care. We conducted a prenatal peer support program, Mentors Offering Maternal Support (M-O-M-S), focused on improving mental health in hurricane-affected areas in southern Louisiana. M-O-M-S consists of six biweekly sessions covering pregnancy acceptance, maternal role identification, family and partner relationships, preparation for labor/fears around labor, well-being/safety of self and baby, and post-delivery health and maternal-infant bonding. The program is led by a "mentor", an experienced mother but not necessarily a clinician or social worker, who guides the group in discussing the topic for the day. Starting in 2023, we implemented the M-O-M-S program in the Bayou and River Parishes regions, the two largely rural regions of the state that had been hardest hit by the most recent major hurricane in the area, Ida. Changes made to the program included offering it online and incorporating a session on disaster preparedness and response. Despite a perceived need for the program from community members and clinicians, recruitment and enrollment were substantially below targets. Most participants were either Black (50.9%) or White (39.6%), and a majority reported at least two serious experiences of a hurricane. Mean baseline score on the Edinburgh Depression Scale was 13.2, above levels of concern, and mean baseline score on the Generalized Anxiety Disorder-7 (GAD-7) was in the "mild anxiety" range. Those who completed the pre- and post-assessments had an average positive change on the depression, anxiety, and pregnancy-related anxiety scales, but no change in perceived stress. Participants expressed strong appreciation of the program, and essentially all participants reported the program achieved its goals and was feasible, appropriate, and acceptable. We conclude that M-O-M-S shows promise as a post-disaster intervention, but significant effort in determining enrollment strategies is necessary to reach a wider range of women who would benefit.

KEYWORDS
disaster, implementation, mental health, peer support, pregnancy

Introduction

Disasters have negative effects in the short term (physical trauma, adverse environmental exposures, and unstable housing) (1) and the long term (relocation, changes in family functioning, and negative economic effects), which interact with social determinants to worsen health among the most vulnerable women, infants, and communities. Disasters also lead to secondary stressors, such as interpersonal trauma (2–4) and financial issues, which can linger for years and affect mental health adversely (5). However, disasters are normally experienced in the presence of others, and the aftermath of disasters can be a time when a community pulls together for support (6).

Studies of pregnant or postpartum populations post-disaster have found a high prevalence of psychiatric morbidity. Consistently high prevalence of depression (18%–35%) has been found after earthquakes (7, 8), hurricanes (9), and floods (10), across multiple continents. Other mental health issues are less-studied, but a high prevalence of symptoms of post-traumatic stress disorder [PTSD (9, 11)] and anxiety has been identified (12). The extent to which pregnancy *per se* is a risk factor for adverse mental health after disaster is not entirely clear (9, 13, 14), but it often overlaps with known risk factors, including female gender, low income, and parenthood (15, 16).

Disaster does not affect all populations equally, even within a geographic area. Several studies indicate that adverse life circumstances, current and prior, interact with disaster to worsen mental health. A longitudinal study of a primarily low-income, African-American group found that poor mental health prior to the storm was particularly important in predicting high risk of post-traumatic stress symptoms and psychological distress after Hurricane Katrina (17). Previous research involving pregnant women specifically has found that history of domestic violence affected response to 9/11 (18), that severity of disaster exposure interacted with social support to affect depression after floods in Iowa (10), and that unmarried status and general hardship were associated with worse mental health after Hurricane Florence (19). Poverty and racism may put women at risk for depression and PTSD (20, 21).

Pregnant women are a particularly important population due to the potential for negative, long-term effects for themselves and their families. Significant mental health issues [i.e., depression during pregnancy and postpartum (9, 22, 23)] are associated with worse maternal physical health, maternal impairment, poorer quality parenting, negative child behavior, and poorer infant cognitive development (24). Trauma and severe stress are directly linked to pregnancy complications (25), and raise blood pressure during pregnancy (26), alter stress hormones (27), and increase vulnerability to infection (28), all of which predispose pregnancies to reduced fetal growth and preterm birth (29–33). Few interventions to improve mental or physical health after disasters have been tested, and the only intervention we are aware of that specifically targeted pregnant women post-disaster was not effective (34). With the increases in disaster exposure driven by climate change and population growth, there is an urgent need to develop programs and responses that can mitigate the effects of disaster on pregnancy.

We conducted a prenatal peer support program, Mentors Offering Maternal Support (M-O-M-S), focused on improving mental health in hurricane-affected areas in southern Louisiana. M-O-M-S is a program addressing adaptation to pregnancy and the emotional changes it brings. Originally designed for military families where a spouse was deployed, it has been shown to improve mental and physical health in pregnancy (35). M-O-M-S was tested in pilot and randomized controlled trials and compared with routine prenatal care alone, within a large military community in the southern United States. The M-O-M-S intervention significantly reduced anxiety related to maternal role identification, preparation for labor, and the relationship with the pregnant woman's mother (36), and directly increased birthweight and gestational age. Given that this intervention has been efficacious among women whose military spouses were deployed or anticipated to be deployed (35), we theorized that it might be useful in another highly stressful set of circumstances, the disaster recovery environment.

Context

Southern Louisiana is one of the areas of the U.S. most vulnerable to climate change and disasters. Most recently, Hurricane Ida (August 29, 2021) caused widespread damage, flooding, and power outages; the region was also strongly affected by Hurricanes Katrina (2005), Rita (2005), Gustav (2009), Isaac (2012), Delta (2020), and Zeta (2020) in recent years, and by river flooding in 2012 and 2016, creating a population over-burdened by disaster. The Bayou Region and the River Parishes, the areas most affected by Hurricane Ida (red area in Figure 1), have three small cities (population < 35,000), with most of the remainder of the area considered rural. Large parts of the region are at medium high or high social vulnerability based on the

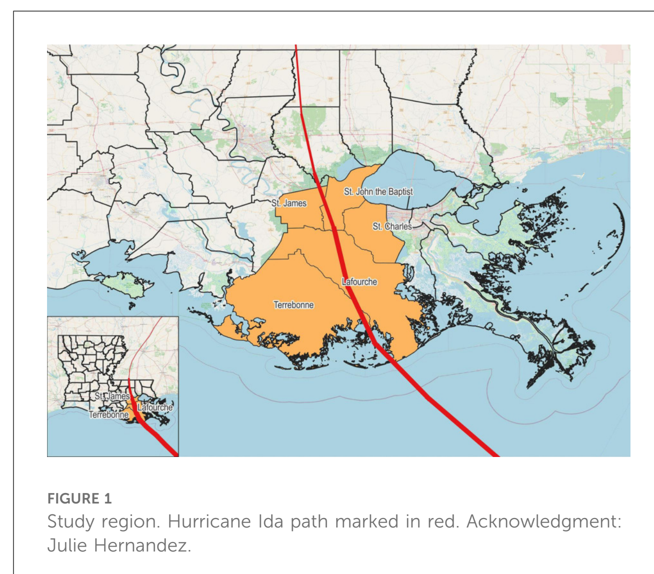

FIGURE 1
Study region. Hurricane Ida path marked in red. Acknowledgment: Julie Hernandez.

CDC social vulnerability index (SVI), indicating an under-resourced population, and these parishes have higher SVI than other parts of the Louisiana Gulf Coast (37). All parishes in the area are considered medically underserved (38) and many parts of the region are health professional shortage areas (HPSA) (39), especially for primary and mental health care. Based on vital statistics data, two-thirds of births in the area are paid by Medicaid; 19% are to women with less than a high school diploma, and 37% to women with a high school diploma only. The racial/ethnic distribution of mothers giving birth is 56% White non-Hispanic; 31% Black non-Hispanic, 3% American Indian, and 8% Hispanic. Prenatal and Women, Infants, and Children (WIC) clinics in the region cluster around the hospitals in the region's cities (and in the River Parishes, many women go to New Orleans or Baton Rouge), but additional satellite clinics are found in some outlying towns.

Key programmatic elements

Program description

The M-O-M-S program consists of a series of group classes in early pregnancy, covering the cognitive and relationship changes of pregnancy and motherhood, and mental preparation for labor. The M-O-M-S intervention was specifically designed to address pregnancy-specific anxiety (inclusive of depressive symptoms), concerns related to family/partner relationships, and provide esteem-building peer support, with each session directly aligned to specific aspects of anxiety and depression pertinent in pregnancy (Table 1). During classes, the mentor leads the group through reflection exercises and facilitated discussions on these topics; a workbook is available to assist with activities. The M-O-M-S intervention framework promotes peer bonding, the building of compassionate, warm relationships that are non-judgmental and culturally sensitive, and the sharing of information that is timed in terms of the progress of the pregnancy. This type of support with collective sharing is designed to decrease anxiety-producing fears and depressive symptoms. Classes are conducted every other week, starting in early pregnancy, and are designed to precede any birthing or infant care classes the woman might plan. All participants continue to receive standard prenatal care.

The classes are led by a "mentor", a mother who has experienced pregnancy, labor, and motherhood. Training for the M-O-M-S program implementation covers training modules specific to each session, as well as information on the theory underpinning the intervention. Individuals experienced as mentors and facilitators walk the new facilitators through various sessions, role playing the mothers, and guiding the facilitator/mentor through the various sessions. Training also includes shadowing by the trainee in ongoing classes.

As we initiated M-O-M-S in a new region with a new focus, our team consisted of nursing faculty and WIC leaders, as well as epidemiologists with expertise in study design and implementation science. In preparation for implementation, we conducted interviews with clinicians, social services providers, and women who had been pregnant during Hurricane Ida, to gather additional information about the region, the disaster situation, and what might be useful in a supportive program. There was consistent support for and perceived need for an intervention like this, from clinicians, community members, and pregnant women (Giarratano et al., under review).

TABLE 1 The M-O-M-S program, as modified for the population and context.

Session	Topics addressed
Pregnancy acceptance	Motherhood: planning vs. ambivalence Pregnancy symptoms Body changes
Maternal role identification	Envisioning oneself as mother Motivation for pregnancy Motherhood as primary vs. competing role
Family and partner relationships	Understanding mother-daughter relationships Mother/mother figure's reaction to pregnancy Wantedness of child Relationship changes due to pregnancy Partner's adaptation to pregnancy Concerns around roles within family and childcare
Preparation for labor/fears around labor	Birth plan Pain management Preparing mentally/physically for birth Resilience/coping Support during and after birth
Well-being/safety of self and baby	Concerns around self and infant during labor and birth Postpartum concerns: health, boundaries, juggling duties, relationship changes Childcare options and plans Safety of the infant Disaster preparedness
Post-delivery health and maternal-infant bonding	Postpartum care for mother and infant

We adapted the M-O-M-S programs based on our goals as well as input from preparatory interviews, staff, and participants. We incorporated a session on disaster preparedness and response, in line with the project goals, and offered online options. While in-person sessions were offered as an option throughout, participants' preference was online. We covered transportation costs, but there was difficulty in navigating transportation due to lack of options for public transportation in rural areas. While women expressed wanting to meet in person, online was more convenient.

Recruitment

In 2023, we implemented the M-O-M-S program in the Bayou and River Parishes regions. Pregnant women were eligible to participate if they were 18 years or older, English-speaking, and in the first half of pregnancy (up to the early second trimester). Women were recruited through prenatal clinics (including outreach via MyChart, the medical records app, and phone through the Ochsner Health System electronic health records system), WIC clinics, social media, and word of mouth. Participants completed questionnaires using a REDCap survey about their disaster experience, worries about future storms, and

mental health (depression, pregnancy-related anxiety). Where available, validated or standard surveys were used; citations are included below. Incentives for participating included gift cards for filling out the pre- and post-intervention surveys, and providing "disaster kits" with materials for evacuating or sheltering in place when pregnant or with a newborn.

Two facilitators, women with experience of motherhood and previous experience in informal counseling and outreach, conducted 20 rounds of the 6-session intervention. Recruitment was substantially below target: we aimed for 8–15 participants per session, but only succeeded in recruiting 1–3 participants per session. (It should be noted that many women said they appreciated the small sessions.) The majority of participants were recruited after hearing about the program from a trusted person (community member, friend, or health provider), or through a combination of a clinic representative/provider contact in addition to MyChart. The Ochsner clinic located in the Bayou region had a higher response rate than either non-Ochsner clinics in the Bayou region or Ochsner clinics in less-affected areas, so the combination of disaster impact and familiarity with the provider may have also had an effect. Outreach via social media, health portals, cold calling, or in-person approaches by someone unfamiliar had limited effectiveness.

Participants

Fifty-three participants completed baseline assessments. Most participants were either Black (50.9%) or White (39.6%) (Table 2) and had at least some post-high school education (80.3%). Most (81.1%) said their most severe disaster-related experience was of Hurricane Ida [Table 3; the hurricane exposure index is one we have used in previous research (23)]. A majority endorsed at least two serious experiences of a hurricane, most commonly serious damage to their own or a family member's home or belongings, or feeling that their life was in danger. A large majority reported being very or somewhat worried that another hurricane would hit the region, as bad as Katrina.

Mental health was a concern in the participants (Table 4). Mean baseline score on the Edinburgh Depression Scale was 13.2, above levels of concern (40). Mean baseline score on the Generalized Anxiety Disorder-7 [GAD-7 (41)] was in the "mild anxiety" range. Those who completed the pre- and post-assessments had an average positive change on the depression, anxiety, and pregnancy-related anxiety scales (42), but no change on the Cohen Perceived Stress Scale (43).

Among responders at follow-up, implementation outcomes were generally positive (Table 5). Essentially all participants reported the program achieved its goals and was feasible, acceptable, and appropriate [using standard questions (44);], with all reporting that the facilitator added to the overall experience. Those who did participate were very enthusiastic (Table 6), and retention was very good. Among those who attended the first session, all attended at least 50% of sessions, with mean attendance at 87% of sessions (median 100%), and participants expressed strong appreciation of the program. Creating a safe space for women increased participant engagement and retention: women expressed appreciation of safe space to talk about how they were feeling without judgment, and women often stated how much they needed to connect and how much better they felt after sessions.

TABLE 2 Participants in M-O-M-S on the Bayou.

Participant characteristics	Mental health measures at baseline (*n* = 53)		Mental health at follow-up (*n* = 34)	
	N	%	*N*	%
Age				
18–25	18	34.0	9	26.5
25–33	25	47.2	17	50.0
34+	10	18.9	8	23.5
Race				
Black	27	50.9	21	61.8
White	21	39.6	12	35.3
More than one race/other race	5	9.5	1	2.9
Hispanic ethnicity				
Hispanic	3	5.9	3	8.8
Non-Hispanic	48	94.1	31	91.2
Education				
High school or less	11	20.8	6	17.7
Some college, no degree	16	31.2	12	35.3
Postsecondary degree or certificate	26	49.1	16	47.1
Employment				
Fulltime	24	45.3	16	47.1
Part-time	11	20.8	2	5.9
Student	2	3.8	1	2.9
Unemployed	16	30.2	15	44.1
Married/partnered	45	86.5	32	94.1

TABLE 3 Experience of hurricanes, M-O-M-S on the Bayou participants.

Hurricane experience	*N*	%
Felt your life was in danger	21	47%
Caused you to have an illness/injury	1	2%
Cause a close family member to have an illness/injury	0	0%
Walked through floodwaters	7	15%
Serious damage to home	12	26%
House flooded	8	17%
Someone close died	2	4%
Damage to own property/belongings	12	26%
Damage to family property/belongings	8	17%
Other family member not in household with illness/injury	1	2%
Overall hurricane experience		
No reported above	16	26%
Minimal	11	18%
Serious	34	56%
How worried are you that another hurricane will hit the region, as bad as Katrina?		
Very	12	35%
Somewhat	15	44%
Not too	3	9%
Not at all	1	3%
Don't know	3	9%

TABLE 4 Mental health score at baseline and follow-up, MOMS on the bayou.

Mental health construct	Baseline					Follow-up					Difference			
	N	Mean	SD	Min	Max	*N*	Mean	SD	Min	Max	*N*	Mean	SD	*p*
Pregnancy-related anxiety (higher is better)														
Acceptance of pregnancy	38	32.2	4.3	18	36	28	32.0	3.7	21	36	26	0.62	3.20	0.34
Identity as mother	38	33.2	2.6	24	36	28	33.6	2.2	27	36	26	0.54	1.61	0.10
Wellness	38	20.9	4.9	11	28	28	22.8	4.3	9	28	26	1.85	4.30	0.04
Preparation	38	21.9	4.3	12	28	28	22.4	3.8	14	28	26	1.58	4.18	0.07
Fear of helplessness	38	23.2	3.3	16	28	28	23.6	2.7	19	28	26	0.81	3.18	0.21
Relationship with mother	38	20.4	4.6	6	24	28	20.0	5.2	6	24	26	−0.12	2.69	0.83
Relationship with partner	38	28.1	4.6	17	32	28	28.7	3.7	18	32	26	1.50	3.86	0.06
Total score	38	179.9	18.0	132	212	28	183.0	16.6	138	211	26	6.77	15.47	0.03
Perceived stress (higher is worse)	52	26.4	4.7	9	38	34	26.9	3.1	20	33	34	−0.30	4.10	0.68
Anxiety (higher is worse)	50	6.2	4.2	0	19	34	4.2	4.2	0	21	33	−1.94	4.51	0.02
Depression (higher is worse)	52	13.2	4.6	0	23	34	11.4	3.6	3	18	34	−1.35	2.81	0.01

Session discussions revealed that women felt overwhelmed. The one-hour session allowed women to process and connect with other women in small groups (2–4). Women were able to create plans for when stress levels increase – often women learned ways other women were coping, and what worked or didn't work for them. Sessions allowed participants to learn from each other – the phrase "not alone" came up frequently. Often women would share text messages and pictures, or meet up after sessions. The discussions allowed women to process what they were feeling without suppressing it. Many women expressed that one hour was not enough and wanted more time to share and connect with each other.

Discussion: practical implications and lessons learned for future applications

Because of our low numbers, we had limited statistical power to address the effectiveness of our program, although our results are generally in a positive direction, and limited ability to rigorously compare our program with other studies. Few interventions have addressed post-disaster mental health, especially among pregnant women. An expressive writing intervention for pregnant women following Hurricane Harvey did not show a reduction in post-traumatic stress (34); a smaller expressive writing study was also conducted with pregnant women after the Fort McMurray fires in Canada (45). General-population studies of interventions to improve mental health after disaster include the Bounce Back Now mobile app, which improved mental health modestly in a randomized trial (46), and My Disaster Recovery, another online platform aimed at addressing disaster-related distress by offering personalized support through web-based sessions, which improved worry and depression symptoms among a small group (47). Narrative expression therapy was also effective at minimizing PTSD symptoms among earthquake survivors in a small trial in China (48).

However, we are able to report several key lessons learned for implementing this and similar programs.

Challenges

Potential participants were often reluctant to enroll

Participants were often hesitant to sign up. It took time to build relationships with women in rural communities, and even with a connection to a health care provider or staff, women were apprehensive or hesitant to sign up for the program. Having a mental health intervention, even one meant to be available to all regardless of mental health status, in some cases ran into barriers with stigma. In a community known for its self-reliance, participants felt they could do it all, without help. In addition, the idea of enrolling in a research study in some cases was met with confusion or suspicion – participants assumed they would have blood tests or pills, rather than meetings and questionnaires.

Lack of health care provider follow-up and engagement was a barrier to recruitment

While providers and health care staff expressed a need for the program in the abstract, in practice, engagement was very difficult, due to concerns about confidentiality, policies and procedures, and general workload. The prenatal clinics were spaced out in distance with varying numbers of potential women to recruit at any one clinic, so it was not feasible to embed a recruiter full time at each site. Women in clinic waiting rooms were hesitant to speak with an unknown community health worker and sign up for the program. It would have been helpful to have more private space where women could talk freely, and for providers and community partners to talk about the program with potential participants and then make an introduction and connection to recruiters.

Working in a research framework adds additional constraints

The required Institutional Review Board (IRB) approvals added significant time to the project, especially as multiple IRBs had jurisdiction over various pieces of this project. Brochures, website, social media posts, and WIC texts all needed to be approved. Social

TABLE 5 Implementation outcomes and program evaluation, M-O-M-S on the bayou.

Implementation outcomes	N	%
It was easy to join the group sessions by Zoom		
Completely disagree	1	4.8
Somewhat agree	1	4.8
Completely agree	18	85.7
Not applicable	1	4.8
I feel the group sessions were a positive experience		
Completely agree	16	76.2
Agree	5	23.8
I feel the group sessions provided me with a support network.		
Completely agree	16	76.2
Agree	5	23.8
I feel the Birth of a Mother manual facilitated discussion.		
Completely agree	10	47.6
Agree	9	42.9
Neither agree nor disagree	2	9.5
I feel the group facilitator added to the overall experience.		
Completely agree	16	76.2
Agree	5	23.8
I feel the number of sessions met my needs.		
Completely agree	14	66.7
Agree	6	28.6
Neither agree nor disagree	1	4.8
I feel the sessions were too long.		
Completely disagree	17	81.0
Disagree	3	14.3
Neither agree nor disagree	1	4.8
I feel the sessions did not focus on my concerns.		
Completely disagree	17	81.0
Disagree	4	19.1
I feel the sessions helped decrease my anxiety.		
Completely agree	10	50.0
Agree	10	50.0
M-O-M-S was a good match for me.		
Completely agree	15	75.0
Agree	5	25.0
The M-O-M-S program was doable for me.		
Completely agree	15	71.4
Agree	6	28.6
I would encourage other pregnant women to participate in the program.		
Completely agree	17	81.0
Agree	4	19.1
The preferred group size for each M-O-M-S group would be:		
<5 participants	16	76.2
5–10 participants	3	14.3
Other	2	9.5

With the exception of the final question on group size, possible responses included: completely agree, agree, neither agree or disagree, disagree, or completely disagree.

media was slow and limited in part because IRB approval for preapproved posts included significant time. Having six months of weekly posts approved by IRB prior to project kickoff would have been a better solution to avoid the IRB approval process while the project was in motion, and having a plan of what to post/text up

TABLE 6 Reported most- and least-liked aspects of the MOMS programs, responses to open-ended questions.

Most liked
Being able to have someone to talk to about things I did not know.
Being able to talk to someone that understood and listened to me
Conversing with other moms close to my age and who have had similar experiences.
I felt comfortable with the women and opening up about my personal life.
I felt supported and listened to at every session.
I liked the conversations we had, the openness to express my feelings, and the reassurance that I got from the girls as well as [reassurance] I was able to give. I enjoyed helping uplift someone else.
I looked forward to each session, I felt as if I'm slowly but surely healing my inner child. I enjoyed the exercises given after each session, that either focused on myself or with my partner or mother. Lastly, everyone who I interact with daily noticed how much happy and at ease I have been.
I love how each session was focused on something different and important information
My group facilitator made me feel very comfortable with opening up and sharing information
Safe space
[facilitator's name] is great! She brought life and healing into the space. She challenged us to think outside of our comfort zone and connect the dots we otherwise may not have
Small class size, support
The discussions and suggestions to work on outside of discussions.
The facilitator was very kind and knowledgeable, and being able to connect with other mothers and know I wasn't alone in my experiences was very eye opening and helpful
The information and reassurance
The whole entire space of comfort and the feeling of not worrying about being judged on a particular situation that you may have been going through.
What I like most about the M-O-M-S classes is that when one time when I had [too many] problems on me and finally were able to talk about it to someone she was there to listen and relate her problems with mines and given me some helpful tips on how to handle the situation.
What I loved the most, was the conversation topics and I really loved the type of energy, topics questions and coping mechanisms that [facilitator's name] showed up.
What i like most about the M-O-M-S classes were the fact of how easily I was able to connect to these women and share my life experiences. Very easy to open up to.
i loved how [carefree] of an environment the sessions were. We went how we were at that moment and time.
No judging.
Least liked
I absolutely love everything about it
I loved everything about it
I think the classes were an overall good experience and nothing like I expected it to be. 10/10.
I wish they were longer. Sometimes just an hour doesn't seem like enough time for us to get super deep into our conversations and also listen to material without having to stop for time reasons.
N/A (x3)
N/A. I really loved everything about this experience.
Not all the moms were able to participate in every session.
Nothing really
Nothing, it was great
The length of the program, just wish it would have been a little longer like a little bit closer to due date to express changes and feelings from what we are about to be going through as far as child birth.
The limited time
There was nothing I didn't like nor enjoy about the moms class.
They didn't last long enough.
What I like least about the M-O-M-S classes is that we never got to meet in person, maybe [at least] once in person would have been nice.
Wish there could be more, or that I could have met more people

front and when is better than aiming for 1 by 1 approvals. Consider obtaining preliminary IRB approval before disaster occurrence, as amendments are normally substantially faster than initial review.

Developing a protocol for mental health concerns is challenging in community-based studies

Relatedly, we were limited in how we could use research tools like the Edinburgh Depression Scale, which includes a question on potential self-harm. The health care partner was concerned about potential liability, but also had limited ability to treat participants in the community. Members of the study team embedded in the community did not want to overreact to passing negative thoughts in ways that could incur significant cost, embarrassment, and potential harm to participants. The team did not want the facilitators, who were not trained in crisis intervention, to be put in a position of trying to de-escalate a negative situation, nor did we feel it was within their scope to be trained in that way for an intervention designed for a broad population. Ultimately we created a response protocol that followed up with a woman and her health care provider if they indicated mental health symptoms above a level of concern but not actively dangerous, and warm hand-off to a mental health hotline for more serious concerns. Facilitators had a protocol to call an ambulance in the case of active crisis, but fortunately this situation did not arise.

Opportunities

Having the option of both in-person and online sessions improved participant attendance

Women often felt overwhelmed with the day-to-day tasks of motherhood; having the choice to meet in-person or online eased many women's concerns of traveling to and from sessions (time), coordinating childcare, and getting ready, and minimized the feeling that the program was just adding another thing to the to-do list. Many women expressed having transportation barriers, so offering online sessions allowed women to meet for session where they were.

Social media is important and could have been better utilized

Engagement with young women via social media can be an important tool in reaching women and community partners. Women mentioned connecting with pregnancy-related resources through TikTok and Instagram. We were slow to create a social media presence, and due to approval processes and concern over participant confidentiality, our social media presence was limited. Effectiveness of posts shared by trusted community partners was higher than those posted only by the program.

Text messaging was generally the best way to contact people

Most women responded via text. Focusing more on text recruitment, and having more text options for the clinical research coordinator at the health care partner would have been useful.

Branding is worthwhile

Marketing materials with consistent branding helped show a professional appearance and reinforce the M-O-M-S identity and mission. Alignment in design across all media (website, flyer, t-shirts, battery chargers, disaster kits, social media, implementation manual) confirms this. Partners complimented the design of the materials, and participants recognized materials in the community.

Finding the right facilitators is crucial

The success of the program among those who did enroll was largely due to the skill of the facilitators. The best facilitators and coordinators are able to connect with pregnant women and manage the organizational tasks, but do not necessarily come from a single field, degree, or experience path. Having a facilitator from the community where the program is meeting is helpful. It saves time on travel, and ensures community connections and shared lived experience. It can be helpful if the facilitators share identities with the potential participants, although, as no one person can share every identity, facilitators need to be able to work across those lines.

Conceptual or methodological constraints

A few constraints can be highlighted: To the extent that we can estimate our program's effectiveness, a pre-post analysis is limited compared to a randomized trial. An additional concern might be that the program is explicitly gendered. In the region where the project was conducted, this was never raised as a concern at any point (interviews, recruitment, outreach to providers, patients, and community groups), but could be an issue for some populations (49).

Conclusions

The public health implications of this and similar programs have the potential to be large. Disasters are increasing in frequency, range, and severity. Pregnant women are a particularly important population to support, due to their centrality to families and subsequent generations. All interventions in this area struggle with the disrupted circumstances that disaster brings, and further implementation research will be needed to identify the best strategies to reach the most affected population as quickly as possible.

We leave the last words to our M-O-M-S mentors:

> When most people think of southern Louisianans "recovering from a storm" they mostly envision the aftermath of physically rebuilding. However, in my experience in working

with individuals who have lived through traumatic experiences, recovery has many facets. As a descendant of a multi-cultural lineage of healing practitioners indigenous and immigrant to these lands—my culture teaches us that a multi-faceted, whole life recovery is needed, especially during times of loss, disaster, and transition. After multiple generations of traumatic disasters on these southern lands, it's important that we not only tend to the physical rebuilding, but also the rebuilding from the invisible wounds.

Pregnancy and motherhood can be overwhelming, especially in the South where women also carry the weight of past traumas from disasters like Hurricanes Katrina and Ida. Our M-O-M-S on the Bayou sessions offered a supportive space for pregnant women to share concerns, connect through shared experiences, and feel less alone. Just being heard and realizing "me too!" can ease emotional burdens and build resilience. The M-O-M-S on the Bayou project gave me the ability to focus on the "whole life recovery" of pregnant women in this area as they mentally and emotionally rebuild from multi-generations of debilitating disasters.

Through storytelling and peer support, women gained strength, confidence, and community. Participants reported feeling more prepared for delivery, better equipped to advocate for themselves, and less anxious about birth. One mom shared how learning she was not alone in her past birth trauma helped ease her fears. Another felt more confident for her third delivery after addressing concerns with the group. Friendships formed in M-O-M-S often continue beyond sessions, with moms checking in on each other—even during crises like Hurricane Francine—and celebrating new arrivals together. One mom, though no longer pregnant, stayed involved for ongoing support and connection.

I feel so grateful to have had the opportunity to partner in community with the M-O-M-S on the Bayou team as a movement toward health equity and collective restoration. Working in a supportive partnership with [the university] allowed me to be a much-needed bridge between institution and the community. In partnership with other community health partners, I was able to work with under-resourced communities, in a way that truly resonated with the needs and lived experiences of childbearers in this area. Healing is not one-size-fits-all. To be effective, healing spaces must be held by people who understand these realities from the inside out; for instance, for Black women, the weight of racism, sexism, generational trauma, and cultural silencing shapes how grief, stress, and emotional pain are carried. During my time with the M-O-M-S on the Bayou's group circles, the community of moms became a space not only of mental and emotional support, but also of cultural reclamation and healing. This work supplied me with so many healing resources, especially as a Black woman who deserves to see myself as the leader of healing spaces, not just as the participant. I was able to work in a way that felt in alignment with my values.

Initially, many women were hesitant to join or open up. But by the end, they expressed deep gratitude for the safe, respectful environment. As one mom put it: "I didn't realize how much I needed other mothers to talk to". Building trust takes time—especially in small, rural communities. Women may be cautious at first, and often the timing is tight due to pregnancy. But the relationships formed are lasting and impactful, proving how essential community-based support is during motherhood.

Final note

We have created a manual for organizations that may be interested in implementing a similar intervention for pregnant women post-disaster; it is available on the Gulf Research Programs repository site (https://grp.griidc.org/).

Data availability statement

The datasets presented in this article are not readily available due to IRB restrictions and protection of participant privacy and confidentiality. Requests to access the datasets should be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by Tulane University Institutional Review Board. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

EH: Conceptualization, Formal analysis, Funding acquisition, Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing. GG: Conceptualization, Investigation, Writing – review & editing. MP: Conceptualization, Investigation, Resources, Writing – review & editing. MS: Conceptualization, Resources, Writing – review & editing. KD: Formal analysis, Investigation, Methodology, Writing – review & editing. ST: Investigation, Project administration, Writing – review & editing. SH: Investigation, Project administration, Resources, Writing – review & editing. SL: Investigation, Methodology, Project administration, Resources, Supervision, Writing – review & editing. KW: Conceptualization, Methodology, Resources, Supervision, Writing – review & editing.

Funding

The author(s) declared that financial support was received for this work and/or its publication. This project was supported by National Academies of Science Gulf Research Project 2000013441.

Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declared that Generative AI was not used in the creation of this manuscript.

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