

Research

Experiences of women who participated in a beta-test for an online-streamed yoga intervention after a stillbirth

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Abstract

Background: Little is known about how to best care for mothers after stillbirth. As such, this paper will report the satisfaction and perceptions of an online yoga intervention (12-week beta test) in women after stillbirth.

Methods: Participants (n=74) had a stillbirth within the last 24-months (M time since loss 9.65 ± 6.9 months). Post-intervention satisfaction surveys and interviews and dropout surveys were conducted. Descriptive statistics were used to analyze survey responses and demographic information. A phenomenological approach was used to explore and understand unique experiences of participant interviews. Data were analyzed using NVivo10.

Results: Twenty-six women (M age 33.73 ± 4.38) were completers (> 3 wks of yoga), 26 (M age 31.82 ± 4.13) were non-completers (< 3 wks of yoga), and 22 (M age 32.94 ± 2.93) dropped out. Twenty completers participated in a post-intervention satisfaction survey with 75% (n=15) reporting being very satisfied or satisfied with the online yoga intervention, found it to be very enjoyable or enjoyable, and very helpful or helpful to cope with grief. Satisfaction and perceptions of the intervention in those who completed an interview (n=12) were clustered around the following themes: benefits, barriers, dislikes, satisfaction, and preferences. Of the 22 dropouts, 14 completed a dropout survey. Women withdrew from the study due to pregnancy (n=3, 21%), burden (n=3, 21%), stress (n=2, 14%), lack of time (n=2, 14%), did not enjoy (n=1, 7%), and other (n=3, 21%).

Conclusion: Findings here may be used to help design future research.

Introduction

Stillbirth, defined as in-utero death at ≥ 20-weeks gestation, is a major public health problem in the United States affecting more than 26,000 women a year.¹ As such, more children die of stillbirth than all forms of infant death combined.² DeFrain et al. referred to stillbirth as the “invisible death,” occurring only in a woman’s body and the tragedy has been noted as one of the most painful, intense, and traumatic human experiences still prevalent in Western society.² Yet little is known about how to best provide care for mothers in the aftermath of a stillbirth.

Because its etiology is often undiagnosable, many families grieve the death of their baby in the absence of a cause of death, and thus, it is not unusual for mothers to blame themselves.³ These mothers are likely to have negative health implications as a result. Examples of negative health implications include: sadness; thoughts of suicide; anxiety; traumatic stress; guilt; shame; and anger.⁴⁻⁶ These effects can last anywhere from three to 18 years and reoccur in subsequent pregnancies even after a live birth.^{3,7-10}

Current health care provider practices are primarily based on cross-sectional studies that have identified etiological factors associated with stillbirth and/or qualitative studies which have explored acute psychosocial care and postpartum experiences.¹¹⁻¹⁴ Mothers have reported a need for interventions to help cope with the mental and physical stressors of traumatic grief¹⁵ and have used support groups, psychotherapy, and medication.¹⁶ However, there is little empirical data to suggest the efficacy of these types of treatments. In fact, one systematic review aiming to assess the effect of any form of intervention (i.e., medical, nursing, midwifery, social work, psychology, counseling or community-based) on parents and families who experience stillbirth failed to identify any randomized controlled trials (RCTs) that met their inclusion criteria.¹⁷

Identifying helpful techniques and aspects of interventions that are sensitive to the needs of women who have experienced stillbirth may aid researchers in designing effective aftercare interventions for women in this population. Therefore, the purpose of this paper is to report the satisfaction and perceptions of an online-streamed yoga intervention in women who have experienced a stillbirth and participated in a 12-week beta test.

Methods

This paper describes the results of a post-intervention, cross-sectional survey and semi-structured interviews in women who have experienced stillbirth and participated in a 12-week beta test. An Institutional Review Board at a University in the southwestern United States approved this study and all participants consented to participate. Women were recruited nationally through non-profit partners (i.e., Star Legacy Foundation, MISS Foundation), social media (i.e., Facebook, Twitter) and online stillbirth support groups (i.e., Infant Loss Organization, SOBBS). Women were included in the study if they: 1) had experienced the stillbirth of a baby (≥ 20 weeks gestation) within the previous 24 months; 2) were 18 years of age or older; 3) reside in the United States; 4) were able to read/understand/write English; and 5) could exercise safely based on the Physical Activity Readiness-Questionnaire (PAR-Q). Women who answered 'yes' to any question on the PAR-Q were required to submit medical clearance from their physician before participating in the study. Women were excluded from the study if they: 1) had a regular yoga practice (> 60 minutes per week); 2) were actively suicidal (based on Edinburgh Postnatal Depression Scale (EPDS) and screening call from a psychologist); or 3) were currently taking psychoactive medication. Women may have been excluded from the study for more than one reason.

The intervention (i.e., beta test) included 12-weeks of online-streamed yoga and women were asked to complete a minimum of 60 minutes per week. A 12-week yoga prescription was posted on the password protected UDAYA website (udaya.com) and women were asked to only participate in the videos prescribed. The videos contained in the first three weeks of the yoga prescription were brief (5–20 minutes) and provided instruction about the common yoga poses that would be used throughout the 12-weeks. Weeks four through 12 included a slow progression of yoga videos and gradually introduced longer videos (up to 60 minutes in duration). All videos included in the prescription were appropriate for beginners (level one). Women who completed > 3 weeks (out of 12 weeks) of yoga were considered 'completers' and those who completed ≤ 3 weeks (out of 12 weeks) of yoga were considered 'non-completers.' This cut

off was selected because week four was the point at which the study participants had completed all introductory videos and longer videos were introduced.

At the end of the 12-week intervention, all women were asked to complete a brief online satisfaction survey via Qualtrics (Provo, Utah) and were given an opportunity to volunteer for a phone interview that asked questions related to their experiences, perceptions, and satisfaction with the intervention (e.g., likes/dislikes and how the intervention impacted their life). Post-intervention satisfaction surveys took women approximately 15–20 minutes to complete and had 15 items. Question types included multiple choice, yes/no, and five-point likert scales ranging from: 1 = very dissatisfied to 5 = very satisfied; 1 = very unenjoyable to 5 = very enjoyable; 1 = very unhelpful to 5 = very helpful; 1 = very unlikely to 5 = very likely; and 1 = strongly disagree to 5 = strongly agree. Research assistants, trained by an expert in qualitative research, conducted the phone interviews using a semi-structured interview guide (i.e., participants were encouraged to share particular responses and experiences in greater depth). Interviews were approximately 20–30 minutes in length and were recorded. Interview questions were developed using Bowen and colleagues' guidelines for employing feasibility studies¹⁸ and key areas of focus. These included satisfaction, intent to continue use, perceived appropriateness, and positive/negative effects. Questions were both direct and indirect questions (See Table 1 for post-intervention interview questions). Women who dropped out of the study (i.e., *formally withdrew from the study*) were asked to complete a brief online dropout survey via Qualtrics (Provo, Utah) to determine the reasons for their withdrawal from the study. Dropout surveys took women approximately five minutes to complete and included 13 items. Question types included multiple choice, yes/no, and five-point likert scales ranging from 1 = strongly disagree to 5 = strongly agree. Women were given nominal monetary compensation for their time to complete the surveys and/or interviews.

Data Analysis

Data from the post-intervention satisfaction surveys and dropout surveys were entered into Statistical Package for Social Sciences (SPSS) Version 23.0 for analysis. Descriptive statistics (e.g., mean \pm SD, frequencies, and percentages) were used to analyze the survey responses and describe the demographic characteristics of participants.

We used a literal and interpretive¹⁹ thematic approach²⁰ to conduct qualitative data analysis as this method is appropriate to explore and understand unique experiences of individuals.^{21,22} Interviews were transcribed verbatim. Two research assistants read each transcript, organized the data, generated categories, and developed codes using an induc-

1. Now that you have completed 12-weeks of online streaming yoga, in what ways has this experience impacted your life?
a. Coping with grief: What are your feelings toward yoga as a coping mechanism for the loss of your baby?
b. Feeling better about self: Do you feel differently about yourself? Or your relationship with yourself?
c. Social relationships: How has yoga impacted your social relationships?
d. Physical activity participation: How has yoga impacted your physical activity behaviors?
e. Eating behaviors: How has yoga impacted your eating behaviors?
f. Other wellness practices
2. Before starting this study, what did you think about yoga?
3. Now that you have completed this study, what do you think about yoga?
4. What did you like most about doing yoga online?
5. What did you like least about doing yoga online?
6. Would you recommend yoga for other mothers with stillbirth? Why or why not?

Table 1. Post-intervention Interview Questions (N=12)

tive process.²³ Codes were then discussed between coders, added, tested, and refined after a second read of transcriptions to develop the final codebook. Based on the codebook, both researchers independently coded the data into themes. After data was coded into themes it was triangulated using NVivo 10 (QSR International, 2012). Discrepancies were discussed between the coders and a third researcher read and approved the final data.

Results

A total of 297 eligibility surveys were completed with 107 women eligible for the beta-test. Ineligible women did not qualify for the study due to one or more of the following

reasons: 1) regular yoga practice (n=24); 2) high suicide risk (n=11); 3) more than two years since loss (n=61); 4) miscarriage (n=28); 5) did not live in the US (n=7); and/or 6) were taking psychoactive medication (n=73). See Figure 1 for Participant Enrollment. Seventy-four women were enrolled into the beta-test of which 26 women were considered ‘completers’ (completed more than three of 12 weeks of yoga) and 26 were considered ‘non-completers’ (completed three or less weeks of yoga). Twenty completers participated in the satisfaction surveys and 12 participated in the post-intervention interviews (six were lost to follow-up). Twenty-two women dropped out of the study (*i.e., formally withdrew from the study*) and 14 of those completed a dropout survey.

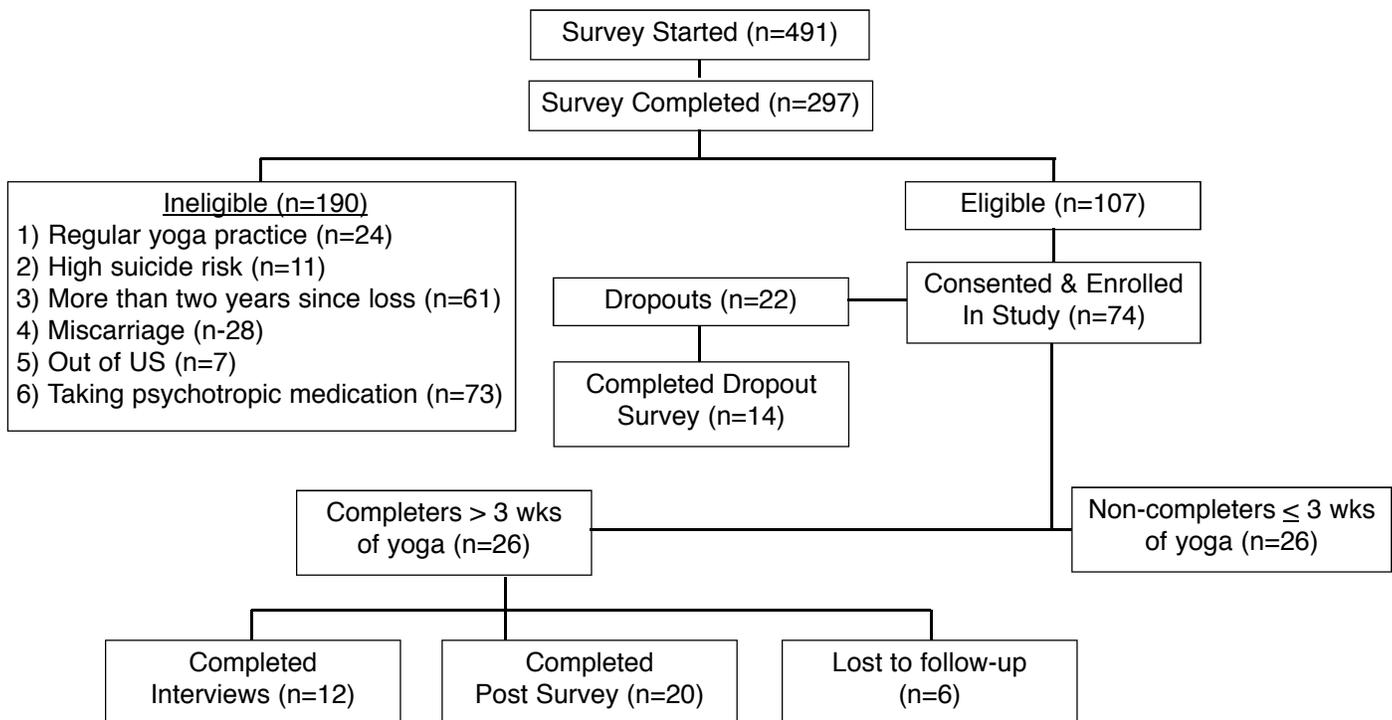


Figure 1. Participant Enrollment

	Overall (N=74)		Completers (N=26)		Non-Completers (N=26)		Dropouts (N=22)		<i>p</i>
<i>M ± SD</i>									
Age, years	32.85	±3.93	33.73	±4.38	31.82	±4.13	32.94	±2.93	0.24*
Time since loss, months	9.65	±6.90	10.61	±7.64	11.05	±6.62	6.87	±5.68	0.08*
Weeks pregnant at loss	32.4	±11.15	35.93	±15.96	31.90	±7.43	28.97	±6.25	0.10*
Weekly yoga minutes	25.18	±18.47	27.40	±13.47	33.96	±22.05	14.97	±15.95	<.01*
Mean weeks of yoga completed	3.92	±3.92	8.38	±2.95	1.27	±1.08	1.77	±1.85	<.01*
Min weeks of yoga completed	0.00		4.00		0.00		0.00		
Max weeks of yoga completed	12.00		12.00		3.00		7.00		
<i>N</i> (%)									
Race									0.34
Caucasian	66	(89.19)	25	(96.20)	22	(84.60)	19	(86.36)	
African-American	4	(5.40)	1	(3.80)	2	(7.70)	1	(4.55)	
Asian	1	(1.35)	0	(0.00)	1	(3.80)	0	(0.00)	
Other	3	(4.05)	0	(0.00)	1	(3.80)	2	(9.09)	
Ethnicity									0.77
Hispanic	13	(17.60)	4	(15.40)	4	(15.40)	5	(22.70)	
Non-Hispanic	60	(81.10)	22	(84.60)	21	(80.80)	17	(77.30)	
Household income									0.41
≤ \$20k/year	4	(5.40)	2	(7.70)	1	(3.80)	1	(4.50)	
\$21k-\$40k/year	7	(9.50)	2	(7.70)	4	(15.40)	1	(4.50)	
\$41k-\$60k/year	15	(20.30)	4	(15.40)	8	(30.80)	3	(13.60)	
≤ \$61k/year	46	(62.20)	17	(65.40)	12	(46.20)	17	(77.30)	
Education									0.41
High school diploma	1	(1.40)	0	(0.00)	1	(3.80)	0	(0.00)	
Some college	10	(13.50)	3	(11.50)	5	(19.20)	2	(9.10)	
Associates/2-year degree	9	(12.20)	1	(3.80)	5	(19.20)	3	(13.60)	
Bachelors degree	32	(43.20)	12	(46.20)	10	(38.50)	10	(45.50)	
Graduate school or above	21	(28.40)	10	(38.50)	4	(15.40)	7	(31.80)	
Marital Status									0.17
Partnered/In a relationship	4	(2.70)	1	(3.80)	3	(11.50)	0	(0.00)	
Single	2	(5.40)	0	(0.00)	0	(0.00)	2	(9.10)	
Married	66	(89.20)	24	(92.30)	22	(84.60)	20	(90.90)	
Divorced	1	(1.40)	1	(3.80)	0	(0.00)	0	(0.00)	
Separated	1	(1.40)	0	(0.00)	1	(3.80)	0	(0.00)	
Biologic children at home (≤ 18yrs)									0.81
0	29	(39.20)	9	(34.60)	9	(34.60)	11	(50.00)	
1	21	(28.40)	8	(30.80)	9	(34.60)	4	(18.20)	
2	14	(18.90)	5	(19.20)	6	(23.10)	3	(13.60)	
3	6	(8.10)	2	(7.70)	1	(3.80)	3	(13.60)	
4	4	(5.40)	2	(7.70)	1	(3.80)	1	(4.50)	
* <i>p</i> value based on ANOVA test Pearson chi-square tests used to compare the proportions between categorical data									

Table 2. Demographics and Characteristics of Study Participants (N=74)

Question	Response	N (%)
Enjoyment/Satisfaction		
How would you rate your overall satisfaction with participating in online streaming yoga? (n=20)	(a) very satisfied or satisfied (b) neither satisfied nor dissatisfied (c) dissatisfied or very dissatisfied	15 (75) 3 (15) 2 (10)
On a scale of 1–5, how would you rate your overall enjoyment with participating in the Perinatal Loss Yoga Study (i.e., like, pleasurable)? (n=20)	(a) very enjoyable or enjoyable (b) neither enjoyable nor unenjoyable (c) unenjoyable or very unenjoyable	15 (75) 4 (20) 1 (5)
How helpful do you feel that online yoga streaming has been to cope with the grief associated with the death of your baby? (n=20)	(a) very helpful or helpful (b) neither helpful nor unhelpful (c) unhelpful or very unhelpful	15 (75) 5 (25) 0 (0)
Would you recommend participating in online streaming yoga for other women who have experienced still-birth? (n=20)	(a) yes (b) no	19 (95) 1 (5)
Yoga Prescription		
I felt that the 60 minute/week prescribed amount of yoga was (n=20):	(a) about right (b) too much (c) too little	14 (70) 4 (20) 2 (10)
Approximately, how many minutes of yoga are you participating in per week on average to date? (n=20)	(a) 0-60 minutes (b) 60-120 minutes (c) 120-240 minutes (d) more than 240 minutes	17 (85) 3 (15) 0 (0) 0 (0)
Instruction in Udaya.com Videos		
The instruction in the online yoga streaming videos is adequate for beginners? (n=20)	(a) strongly agree or agree (b) disagree or strongly disagree (c) neither agree nor disagree	16 (80) 3 (15) 1 (5)
The instruction in the online yoga streaming videos allows me to feel safe from injury when participating in yoga poses? (n=20)	(a) strongly agree or agree (b) neither agree nor disagree (c) disagree or strongly disagree	16 (80) 2 (10) 2 (10)
Limitations		
Were there any limitations that you experienced while accessing the videos? (n=20)	(a) no, none (b) computer/internet issues (c) limited device accessibility (d) difficulty seeing the video (e) pregnancy	8 (40) 6 (30) 3 (15) 2 (10) 1 (5)
Were you pregnant or did you become pregnant during the study? (n=20)	(a) no (b) yes	12 (60) 8 (40)
Did you enjoy participating in yoga while pregnant? (n=8)	(a) no (b) yes	6 (75) 2 (25)
Was your pregnancy a barrier to participation in yoga? (n=8)	(a) yes (b) no	7 (87) 1 (13)
What were the barriers that kept you from participating in yoga while pregnant? Select all that apply. (n=8)	(a) fatigue (b) the poses were uncomfortable (c) bodily pain (d) afraid of hurting the baby (e) feeling sick (f) scared it may incr. risk for stillbirth (g) I did not feel safe doing yoga	6 (75) 6 (75) 4 (50) 3 (38) 3 (38) 2 (25) 2 (25)
Adherence		
Now that you have experienced yoga, how likely are you to continue your yoga practice in the future? (n=20)	(a) very likely or likely (b) undecided (c) unlikely or very unlikely	16 (85) 4 (15) 0 (0)
Which do you prefer most, yoga online or in-person? (n=20)	(a) have not experienced yoga in-person (b) in-person (c) no preference (d) online	8 (40) 6 (30) 4 (20) 2 (10)

Table 3. Post-intervention Satisfaction Survey (N=20)

Demographics

Overall, women were on average 32.85 (\pm 3.93) years old, 9.65 (\pm 6.90) months since their loss, and were 32.4 (\pm 11.15) weeks pregnant at time of their baby's death. On average, completers finished 8.38 (\pm 2.95) weeks of yoga with a range of 8 weeks (min 4 weeks, max 12 weeks). See Table 2 to see the demographic characteristics of completers, non-completers, and dropouts. No significant differences were found between groups.

Post-intervention Satisfaction Surveys

A total of 20 women completed the post-intervention satisfaction survey (See Table 3). A majority of women (n=15, 75%) reported being very satisfied or satisfied with their participation in online streaming yoga. A majority of women (n=14, 70%) also felt that the 60 minute/week prescribed amount of yoga was “about right” and the instruction was adequate for beginners (n=16, 80%). Forty percent of women (n=8) were pregnant or became pregnant during the study. Of those, the majority did not enjoy participating in yoga while pregnant (n=7, 87%) and 75% (n=6) felt that their pregnancy was a barrier to participation in yoga. The most commonly reported reasons were due to fatigue, the poses were uncomfortable, bodily pain, fear of hurting the baby, or feeling sick. The majority of women (n=16, 85%) reported they were very likely or likely to continue their yoga practice in the future.

Post-intervention Interviews

A total of 12 women (all completed >3 weeks of yoga) participated in the post-intervention interviews (See Table 1 for post-intervention interview questions). Women's experiences and perceptions of the online yoga intervention were clustered around the following categories: benefits, barriers, dislikes, satisfaction, and preferences. Categories and subcategories are listed in Table 4 and described below.

Benefits

There were 77 references to the benefits of participating in online yoga with most of these relating to feeling better mentally (20 references), mindfulness and calm (19 references), time for self (12 references), and feeling better physically (9 references).

Feeling better mentally

Those who mentioned feeling better mentally referred to: clarity (3); improved anxiety/stress (7); improved mood (4); relaxation (3); and self-confidence (3). Women felt yoga helped them to gain clarity about the trauma they had experienced: “I know in a few of the sessions... I was able to find some more clarity over the loss in that situation.”

Barriers	27
Family & Mother Responsibilities	6
Pregnancy	5
Home	4
Lack of Motivation & Accountability	4
Time	4
Technical Issues	2
Anniversary	1
Physically Related	1
Benefits	77
Feel Better (Mental Health)	20
Improved Anxiety/Stress	7
Improved Mood	4
Clarity	3
Relaxation	3
Self-confidence	3
Mindfulness & Calm	19
Time for Self	12
Feel Better (Physical Health)	9
Flexibility	3
Sleep	3
Increased Strength	2
Weight Loss	1
Breathing	7
Awareness of Health Behaviors	4
General Wellbeing	3
Increased Physical Activity	3
Dislikes	21
Lack of Instructor Feedback	4
Lack of Autonomy	4
Didn't Bond With Site	3
Didn't Look Forward To It	2
Difficulty Following Along	2
Lack of Accountability	2
Lack of Human Interaction	2
Not Impact Grief	2
Satisfaction	33
Enjoyment	14
Online Convenience	13
Privacy	3
Variety	2
High Quality	1
Preferences	16
Interested In Continuing	7
Preference for Studio	6
Unchanged	2
Stressful	1

Table 4. Categories and subcategories of women's experiences and perceptions of the online yoga intervention

Some felt their anxiety/stress improved and they used it as a means to cope with the anxiety from their grief: "With the grief comes anxiety and so the yoga really helped me with that and... whenever I felt stressed out about something I would just be like, ok it's yoga time." One woman mentioned that she thought the yoga improved her anxiety enough to get pregnant again. Another felt the anxiety relief from yoga was helping her to regain an ability to partake in prior activities she had relinquished: "It got a little better when I started doing yoga and therefore... I'm leaving the house more. I'm socializing a little bit more. There is (sic) still days where I just want to sit at home... but there's less of those." One woman said that her baby's death "shook my whole sense of self and confidence, I think there was some more confidence... knowing I was doing something that was good for my body and mind."

Awareness and calm

In relation to awareness and calm, women talked about yoga and its ability to help them focus, keep their mind quiet, and calm and relax them: "[yoga] has helped me to calm down and get me focused..." Another mother shared, "The break that you get while you're practicing; the quietness that... our minds are just constantly like flailing through everything, even in the background and I feel like, just the practice itself, focusing on what your own physical structure is doing and the movement, it... it does sort of quiet that, all that noise."

Time for self

Women shared that yoga was a means to practice self-care. It helped them refocus their time: "I just really feel that yoga is the perfect way to... get that quiet time." Another mother said; "Once you lose a child it's hard to be able to find time for yourself and doing the yoga helped me find time for me and refocus on what's important with me."

Physical health

Feeling better physically was mostly related to flexibility (3) and sleep (3) with a few women mentioning increased strength (2) and weight loss (1): "I liked the way the flexibility and the muscle and ligament stretching was really nice to be able to get that in, and then to work those core muscles was really nice." Another stated: "I think there are times when it helped with some of the sleep."

Barriers

There were 27 references to barriers to participating in yoga with family responsibilities (6 references) being the most predominant barrier. Others included home environment (4), pregnancy (5), and lack of motivation and accountability (4). A few women said that there were technical issues (2) that kept them from participating.

Family and mother responsibilities

Taking care of family and other mothering responsibilities were barriers to online yoga. Women said they had "a lot going on" and that even though they had lost a child, they still had busy aspects of their life, such as taking care of their living children. One woman said that it was hard for her to find the time due to her living children and expecting another.

Home milieu

Women shared that the home environment was a barrier to participation due to animals, children, background noise and other interruptions: "I thought it would be great because it would be flexible but what I found, I think, was because I was home, other things got in the way."

Pregnancy

Women who got pregnant during the yoga intervention talked about their belly getting in the way, being uncomfortable, and being tired during the pregnancy. These factors kept them from participating: "The further I got into my pregnancy, the more uncomfortable the yoga became."

Motivation and accountability

Women felt that they didn't have the motivation because they didn't have other people around. One woman said: "...the lack of motivation sometimes... Like, not having other people around me to help, you know, if it got hard." They also mentioned that they didn't have an instructor holding them accountable.

Technical issues

A few women referred to their Internet connection as the reason they had a hard time participating.

Time

Women reported a lack of time as a barrier: "It was very hard to find time... I have a two year, an almost two-year old, so it was hard to find time in my day to be able to get it done without it affecting... or being able to stay focused on it [yoga], because I always have her".

Dislikes

Women shared what they didn't like about the online yoga intervention. Dislikes were mostly related to the lack of autonomy (4) and the lack of instructor feedback (4), but some mentioned not bonding with the site (3) or having difficulty following along (2).

Lack of autonomy

A few women didn't like that there was a yoga "prescription" that they had to follow, according to what was assigned on a week by week basis: "I would like to be able

to just choose whatever class I want, do whatever...freedom to pick whichever class”.

Lack of instructor feedback

Some women wanted to have the instructor feedback regarding their performance and correct alignment in the yoga poses. Women were unsure what their body was supposed to feel like in each yoga pose.

Not bonding with site

Women mentioned they didn't "bond" with the site. One woman specifically didn't think that the classes had enough "diversity" with the students in the yoga videos related to experience and weight: "All the women were obviously really good at yoga and had been doing it awhile; all very slim. There weren't too many people of color or a lot of different ethnicities."

Difficulty following along

Some women had a hard time learning and then doing poses simultaneously. One woman didn't like continually having to adjust her screen.

Satisfaction

There were 33 references related to being satisfied with the online yoga. This was mostly related to enjoyment (14) and online convenience (13). A few references were made to privacy and the quality and variety of the videos.

Enjoyment

Women reported enjoying the online yoga. Some women said that they weren't expecting to enjoy it but thought it was "awesome." Some reported that the website was easy to follow along and others reported enjoying instructor styles: "I liked the focus on form and having good form. I learned things that I haven't learned in [group-based classes] about posture and how to be."

Online convenience

Women shared that having access to yoga online was convenient. They didn't "stress" about time or finding child-care: "I actually like the online just because it's more flexible as far as class time goes, it's as flexible as you can get really." Other women talked about the convenience in relation to not being self-conscious: "Having it online like that I could feel comfortable that okay my shirt is coming over my belly button but nobody can see, so who cares".

Preferences

Women were asked about what they thought about online yoga and their preference for yoga online or in-person in the future. There were some references (7) made related to

interest in continuing yoga and some references (6) were made regarding interest in trying yoga in a studio. A few women shared that their preference was unchanged. Women felt that experiencing yoga made them want to continue and they looked forward to doing it more: "I think the option to do it at home is a good one to have a guided practice."

Dropout Surveys (formally withdrew)

Fourteen of 22 (63%) who dropped out of the beta-test (i.e., formally withdrew from the study) completed a drop out survey. Three women (21%) became pregnant during the study and one (7%) was pregnant before the study started. These women indicated they were concerned that yoga would interfere with the health of their pregnancy (i.e., increase risk of another stillbirth, pregnancy anxiety, or weren't familiar with yoga.) Overall, the reasons for withdrawal from the study included: pregnancy-related burden; stress; lack of time; did not enjoy; and other. Overall, despite dropping out of the study, most women (n=9, 75%) enjoyed the online streaming yoga videos. Of all the women that dropped out, half (n=7) reported that their doctor recommended participation in physical activity and none recommended yoga after their baby's death.

Discussion

This is the first study to report the satisfaction and perceptions of an online-streamed yoga intervention in women who have experienced a stillbirth and participated in a 12-week beta test. These data may inform future online intervention research using complementary approaches (i.e., yoga) for grieving mothers. Overall women who completed three or more weeks of the online intervention were satisfied with online yoga as a means of delivering an intervention after a baby's death. Women perceived the online yoga as beneficial to both their mental and physical health, ability to be more aware and calm, and self-care. Women reported barriers shared by other middle-aged women and/or women of live births (e.g., time, motivation, family responsibilities).²⁴ All but one would recommend it to other mothers of stillborn children.

The delivery of online yoga in this population is an innovative yet strategic approach, as it is based upon barriers to participation in physical activity specific to women who have experienced a stillbirth.¹¹ For example, mothers in this population have reported a preference for home-based physical activities because they want to remain anonymous; they don't want to see other babies and/or don't want to feel pressured to talk about their tragedy with others.¹¹ Online yoga offers a way for women to practice in the privacy of their own home, when they desire.

Benefits of online yoga in this study were mostly related to awareness, calm, and feeling more mental and emotional clarity. This is not surprising as there is exhaustive literature about the mental and emotional benefits of participating in yoga.²⁵ Specifically, in those who have symptoms of PTSD as a result of a traumatic event (e.g., war, interpersonal violence, weather), yoga may be effective in reducing symptoms of anxiety and hyperarousal.²⁶⁻²⁸ Because women are six times more likely to experience PTSD after a stillbirth (as compared to women who have live births), there is a need to determine the effectiveness of using online yoga for improving PTSD symptoms in mothers after stillbirth.²⁹

Barriers to participating in online yoga were similar to those reported in women of live births (e.g., time, motivation, and family responsibilities).³⁰ They were also similar to other home-based interventions (e.g., home, family responsibilities).³¹ Strategies should be considered to limit technical issues (e.g., contact person to call with concerns, instructions for overcoming technical issues provided at start of study, phone tutorial reviewing strategies to overcome technical issues).

Women mentioned that the lack of autonomy was something that they disliked about the delivery approach, however, all but two women reported they felt safe participating in yoga at home. We did not allow women to choose the videos in which to participate, in order to decrease the likeliness of an adverse event (i.e., women participating in yoga classes they are not prepared for and experiencing injury as a result). Instead, women were given videos that slowly introduced common yoga poses and increased in length of time over the 12-week period. In a recent meta-analysis related to the safety of yoga, adverse events were reported as comparable (no difference) to interventions of usual care or exercise. Serious adverse events and dropouts due to adverse events were comparable even to education or psychological interventions (e.g., health education).³² However, the studies reported in the meta-analysis were face-to-face or group-based interventions which had an instructor present. Rates of adverse events or other safety issues related to online yoga have not been reported. There is a need for further research that explores the safety of online delivery of yoga.

Lack of instructor feedback and difficulty following along were other aspects of online-streamed yoga that were of concern to the mothers. However, some shared they liked to watch the video, practice the pose, and repeat the video until they felt they “got the pose right.” In yoga philosophy, *Svadhya* (i.e., turning inward and observing actions, reaction, emotions and habits) is taught to students, allowing them to focus on their internal sensations, listening to internal body cues, and increasing self-awareness.³³ This practice of *Svadhya* may limit the necessity of instructor feedback

as the students learn to practice yoga within their own capabilities. Future interventions may consider providing participants with a general philosophical background of yoga and observing how this might change their expectations related to yoga, the instructor, and how they follow along with the poses.

Strengths and Limitations

We believe the work presented here is important and contributes to the literature. Online-streamed yoga has not been explored as most yoga interventions are face to face, DVD, or a handout provided to participants. Also, this is the first study to explore a home-based modality for managing mental health in women after a stillbirth, once they have left the hospital and are essentially “on their own” to cope with the grief associated with the death of their child. Finally, this study represents a strategy that can be largely disseminated (national reach being online) with little resources (cost is only \$12 a month to participate in online yoga). This study provides data to inform future interventions aimed at improving mental health among women who have experienced a stillbirth.

Yet, despite its importance, there are limitations of this study that are important to note. First, the number of women who were considered non-completers (n=26) was the same as those considered completers. Information from those who didn't comply would add to what we know about designing online yoga interventions for women of stillbirth. This information is imperative considering this population's desire to have home-based options for activity. Women were considered completers if they ranged anywhere between three to 12 weeks of participation and this operational definition is quite broad. However, because this study was a beta test without funding, the broad definition allowed us to collect data from all women who completed videos beyond the introductory videos. First, despite the length of participation, most found the videos to be enjoyable/acceptable suggesting this approach may be suitable and warrants further investigation. This also allowed us to understand what dose may be most feasible in an effectiveness study. Second, we were not able to offer any classes that were specific to women that got pregnant during the intervention. This may have helped women who became pregnant feel safer about participating in yoga and/or given them better modifications as their belly grew and became uncomfortable for participation, increasing their likelihood of compliance. Health promotion professionals may consider the fact that women who have had a stillbirth are likely to get pregnant again (50-85% within 18 months) and that interventions need to be designed with considerations for subsequent pregnancy.³⁴

Conclusion

Online-streamed yoga may be a useful approach to deliver yoga to women who have experienced a stillbirth. Women enjoyed the online experience, would recommend it to other mothers, and felt that it helped them to be mindful, calm and provided other mental and physical health benefits. Women did not like the lack of autonomy or instructor feedback aspects of online delivery. Additionally, most women who became pregnant dropped out because they were afraid of harming their baby or increasing their risk of another stillbirth due to participating in yoga. Future feasibility, pilot, and randomized controlled trials are warranted using online-streamed delivery of yoga. Specifically, strategies for: (1) overcoming challenges that impact compliance (e.g., grief, motivation, time); (2) overcoming barriers related to technical issues; (2) education about the safety of yoga at home and during pregnancy; and (3) education about the philosophy of yoga may help in the delivery of online yoga in women who have experienced a stillbirth.

Conflict of interest statement:

The authors declare that there are no conflicts of interest.

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