



# Enhancing Accessibility of Physical Activity During Pregnancy: A Pilot Study on Women's Experiences With Integrating Yoga Into Group Prenatal Care

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## Abstract

**Introduction:** Health guidelines suggest that pregnant women should participate in daily physical activity, yet rarely do they meet these guidelines. Means to enhance accessibility of physical activity for pregnant women are required, and yoga has been suggested as a possible method to enhance women's sense of confidence and competence with physical activity. In this pilot study, our primary aim is to evaluate pregnant women's perceptions about their lived experience of an intervention which integrates a low-intensity form of physical activity, yoga, into prenatal care; our secondary aim is to evaluate changes in participants' self-efficacy for physical activity and time spent in physical activity over time.

**Methods:** Held in an outpatient obstetrics department of an urban hospital system in the United States, this pilot study enrolled 16 pregnant women to participate in the intervention throughout their pregnancy. We explored participants' lived experience of the intervention using qualitative methods (phenomenology). Means, variances, and covariances were calculated for the 2 measures (self-efficacy and time spent in physical activity) over the intervention period.

**Results:** Qualitative findings from focus groups suggest that it is acceptable for prenatal yoga to be integrated into group prenatal care classes and women reported increased confidence with physical activity during pregnancy. Participants did not consider the intervention to fit within the traditional definition of exercise. Women reported increased amounts of time spent in physical activity from baseline to the end of pregnancy, but there were no statistically significant changes in self-efficacy over time.

**Discussion:** The integration of gentle physical activity into the group prenatal care model warrants further attention for potential benefits with regard to maternal physical and mental wellness.

## Keywords

pregnancy, physical activity, yoga

## Introduction

The American College of Obstetricians and Gynecologists (ACOG) recommends 20 to 30 minutes of physical activity on at least five days per week for pregnant women, unless the individual has contraindications (eg, preterm rupture of membranes, cervical insufficiency, placenta previa).<sup>1</sup> However, cross-sectional data from sources such as the National Health and Nutrition Examination Survey and others report that less than 20% of pregnant women engage in activity at that level.<sup>2-4</sup> Despite frequent contact with health-care providers during pregnancy, many women report a lack of knowledge and/or self-efficacy for engaging in physical activity or identify other barriers such as lack of time and lack of facilities/resources.<sup>5-7</sup>

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Research is warranted to evaluate methods to help pregnant women increase physical activity, even light-intensity activity. One such method is to expose women to activities which increase a sense of confidence and competence with activity.<sup>8</sup> Prenatal yoga is a form of low-intensity mindful physical activity that could be a “gateway” to increased motivation for physical activity.<sup>9-12</sup> Women have expressed interest in prenatal yoga because it is gentle, seems to be a safe form of physical activity, and can occur in a group-based supportive environment.<sup>11,13-15</sup> Although studies have emerged recently that evaluate behavioral/physical activity interventions focused on weight management in pregnancy,<sup>16,17</sup> few studies to date have evaluated the integration of an light-intensity physical activity intervention within an existing model of prenatal care. Hence, the primary goal of this pilot study was to explore women’s perceptions about their experiences with the integration of prenatal yoga into routine CenteringPregnancy prenatal sessions (Centering Pregnancy Care Plus Yoga [CPC + Y]). The second aim of the study was to explore preliminary effects of CPC + Y on time spent in physical activity over time and on women’s self-efficacy for physical activity.

## Methods

The study protocol was reviewed and approved by the institutional review board of Virginia Commonwealth University. Conducted in the obstetrics department of the university’s health system, this pilot study used an embedded mixed-methods approach. Eligible participants were adult, English-speaking pregnant women who were participating in CPC for prenatal care with no ACOG contraindications to physical activity. After informed consent and enrollment, participants engaged in the CPC + Y intervention, involving a 30-minute manualized yoga session taught by experienced prenatal yoga instructors, at the end of each CPC meeting.

For aim 1 (participants’ experiences with intervention), focus groups were held at the 6-weeks postpartum visit in the obstetrics office, using questions focused on the phenomenon of physical activity during pregnancy. A phenomenological qualitative approach was used for the analysis of this qualitative data, with initial analyses by 2 authors (P.K. and C.A.); to enhance rigor, a third author (S.M.) provided an independent review and we used participant checking to confirm themes.<sup>18-20</sup> For aim 2 (preliminary effects of CPC + Y), means, variances, covariances, and 95% confidence intervals were calculated for the pre-/post-data time points and a Wilcoxon Signed-Rank Test was conducted. The Physical Activity Self-Efficacy Scale (PASES) is an 8-question scale which contains items about self-management of physical activities and social support regarding physical activity.<sup>21,22</sup> The Pregnancy Physical Activity Questionnaire (PPAQ) was used to determine amount of time of engagement in physical activity.<sup>23</sup>

## Results

The study involved 16 women who participated in the CPC + Y intervention, 50% of which were white and 50% were black/

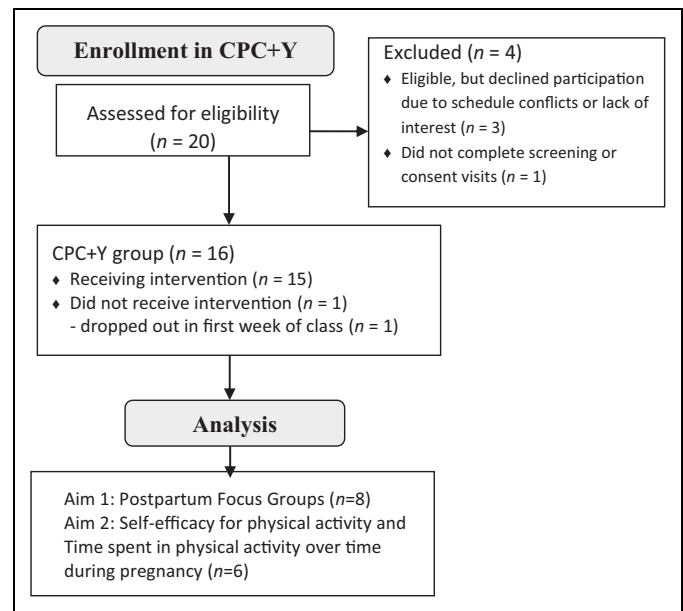


Figure 1. CONSORT diagram.

African American, at a mean age of 29.3 (6.5); see Figure 1 for the CONSORT diagram. Most participants were married (n = 10; 63%) and had a part- or full-time job. All participants had at least a high-school education or equivalent and reported at least weekly physical activity prior to starting the study.

### Aim 1: Evaluate the Lived Experience of Participants With CPC + Y

Eight postpartum women were able to participate in the focus groups holding their 6-week old infants in their laps. Two key themes arose from the focus group discussions: First, participants reported uncertainty about safe exercise during pregnancy and were relieved that prenatal yoga was offered as an activity. One participant reported that *the yoga classes started here and I could see what was okay . . . and what wasn't okay to push the limit with*. Participants felt a sense of relief that they could engage in the yoga classes in a *safe environment* and that they knew the classes were appropriate because their clinicians were aware of their participation. Multiple participants suggested that the yoga classes served as a motivator to engaging in other physical activity outside of class. For example, one woman expressed that the participation in the CPC + Y classes helped provide motivation to add an additional yoga class to her week: *I started going to the yoga class on Tuesday mornings and these classes introduced me to that and it was a great way for me to stay active and know what was okay for me to do*. Of note, participants felt that the classes were too short and gentle to be considered true exercise. As suggested by one participant: *It was only 30 minutes and I would have liked for it to be even longer*; several participants echoed this sentiment stating that they desired more time in class.

Second, participants found that physical activity in the form of yoga integrated with CPC was extremely convenient. For

**Table 1.** Self-Efficacy for Physical Activity and Time Spent in Physical Activity.

Measures	Baseline (Early Pregnancy), n = 6			End of Intervention (Late Pregnancy), n = 6			P Value <sup>a</sup>	Effect Size
	Mean (SD)	Median	(Min, Max)	Mean (SD)	Median	(Min, Max)		
Self-Efficacy for Physical Activity (PASES)	26.50 (3.27)	26.00	(23.00, 32.00)	25.67 (1.75)	25.00	(24.00, 29.00)	0.8750	0.2246
Number of days physically active for at least 30 minutes in past week (days; PPAQ-1)	4.33 (1.97)	4.00	(2.00, 7.00)	5.17 (1.47)	5.50	(3.00, 7.00)	0.1250	1.1069
Number of days physically active for at least 30 minutes in a typical week (days; PPAQ-2)	4.67 (1.63)	4.50	(3.00, 7.00)	4.67 (1.63)	4.50	(3.00, 7.00)	1.0000	0.0001
Duration of time per week during this trimester of pregnancy engaged in physical activity (hours; sum of PPAQ-3 to -9)	4.58 (3.89)	3.00	(1.50, 11.00)	7.21 (4.47)	6.13	(3.00, 15.75)	0.0938	1.0242

Abbreviation: PPAQ, Pregnancy Physical Activity Questionnaire.

<sup>a</sup>Wilcoxon Signed-Rank Test.

example, one participant stated *having it at the end of our Centering session made it really convenient for those of us who were able to stay afterwards, that made it really helpful*. For this and several other participants, the novelty of yoga as a physical activity which was easily integrated into their prenatal care schedule was an exciting prospect when learning about the study. She stated she was excited to sign up once she realized, *there's a free yoga class that's conveniently timed right after our prenatal appointment*. Despite the convenience of integrating yoga into the prenatal care schedule, several participants mentioned that the schedule and timing could benefit from some adjustments in terms of end-time or conflict with children's school schedules.

### Aim 2: Explore Preliminary Effects of CPC + Y

With regard to time spent in physical activity, the mean and median number of days active in past week (PPAQ1) and number of days active in usual week (PPAQ2) scores for the intervention participants who completed the baseline and end-of-intervention visits (n = 6) are presented in Table 1. There were no significant differences in activity in the past week (PPAQ1;  $P = .125$ ) nor activity in a typical week (PPAQ2;  $P = 1.000$ ). There was a trend in increased amount of time participants engaged in physical activity, from a mean of 4.58 h/wk in early pregnancy to 7.21 h/wk in late pregnancy ( $P = .0938$ ). There were no significant changes over time in PASES.

## Discussion

This study's qualitative findings suggest that participants perceive the integration of prenatal yoga into group prenatal care as feasible and acceptable. Participants in this study reported that group-based classes increased feelings of safety surrounding physical activity during pregnancy. Historically, pregnant women were advised to abstain from physical activity,<sup>24</sup> and despite that several organizations have promoted healthy physical activity in pregnancy for weight management and stress relief,<sup>25,26</sup> there remains confusion about what activities are "safe" during pregnancy and many women lack self-efficacy

for physical activity.<sup>13,27</sup> Participants expressed appreciation for the integration of yoga with prenatal care to address this uncertainty about safety.

The quantitative results from this study did not reveal significant changes over time, but participants reported trending increased amounts of physical activity from early to late pregnancy. With regard to the lack of changes over time in self-efficacy for physical activity, there are several possible explanations for these findings. Although the women reported enjoying the yoga sessions integrated into the CPC groups and perceived it to be beneficial to their health and the health of their baby, they did not view it as a regular form of "exercise" or physical activity, particularly given that the class was only 30 minutes. Similar results were found in a previous study reporting women viewed yoga as a low-intensity and relaxing exercise.<sup>11</sup> Future research should include a consideration of yoga as a form of physical activity and should evaluate the appropriateness of the measures (eg, PASES, PPAQ) in this population.

Although this study used innovative approaches to understand an area that is under studied, it has some limitations: the small sample size, lack of randomized control group, and representation of 2 racial/ethnic groups (white and black/African American) presents limitations to internal and external validity. However, this was designed to be a pilot study with the primary goal of evaluating acceptability and determining intervention effects to support the development of a future randomized controlled trial. We recommend that future randomized controlled studies should include a comparison group that may control for time and attention, recruitment of a racially/ethnically heterogeneous sample population, and an appropriately powered sample size to account for the natural variability of physical activity in pregnant women.

## Conclusion

Prenatal yoga integrated into group prenatal care was overall well-received by the women who participated and has the potential to be integrated on a wider scale in order to reach

more women. Although there were minimal changes in quantitative outcome measures over time, participants in the intervention reported increased amounts of physical activity from early to late pregnancy. Prenatal yoga as a form of gentle physical activity warrants further attention for the possibility of integrating into group prenatal care and for its potential benefits with regard to maternal physical and mental wellness. Future research is required to evaluate whether and how yoga completed in a group may also contribute to positive physical activity experiences and contribute to physical activity self-efficacy and enhance motivation for future physical activity.

### Authors' Note

This study was registered on clinicaltrials.gov as NCT02873481.

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