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Physical Activity during Pregnancy may Mitigate Adverse Outcomes Resulting from COVID-19 and Distancing Regulations: Perspectives of Prenatal Healthcare Providers in the Southern Region of the United States

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ABSTRACT

International Journal of Exercise Science 14(3): 1138-1150, 2021. Prenatal physical activity (PA) may mitigate adverse outcomes that have increased as a result of the coronavirus pandemic, including poor maternal mental health. This study explored the perspectives of prenatal healthcare providers (PHCP) on maternal PA during the pandemic and identified resources providers would like to have to inform clinical discussions and prescription of PA. Semi-structured interviews were completed with PHCPs following a qualitative description approach. A content analysis coded data to inform three study objectives: 1. Changes to maternal health, 2. The role prenatal PA can have during a pandemic, 3. Resources PHCPs would find helpful to discuss and prescribe PA. Nine PHCPs completed interviews. Changes to maternal health include an increase in stress, fear surrounding labor and delivery, and risk of pre-existing problematic behaviors (e.g., substance abuse). PA was identified as helpful for improving mental health and preventing excessive gestational weight gain (EGWG). Providers expressed interest in having low cost referral options for prenatal PA that are accessible from home. PHCPs suggest PA during the pandemic can improve maternal mental health and prevent EGWG. To support clinical discussions and prescriptions of prenatal PA, knowledge translation initiatives should include informing PHCPs of referral resources for low cost at-home fitness options.

KEY WORDS: Pregnancy, coronavirus, physical activity, obstetrics, public health

INTRODUCTION

Prenatal physical activity has been shown to have positive maternal and fetal health benefits, including prevention of prenatal and delivery complications, excessive gestational weight gain and future chronic disease risk (11, 20). Leading a physically active lifestyle during pregnancy is recommended for all women without contraindications to exercise (20, 26). Pregnant women without contraindications to exercise are recommended to engage in 30 minutes of moderate intensity exercise per day, and are also encouraged to incorporate strength training at least two

to three times per week (20). Despite all of the benefits of prenatal physical activity, only 23% of pregnant women exercise in accordance with guidelines established by the ACOG (14). Furthering the existing problem, the 2019 novel coronavirus disease (COVID-19) pandemic appears to negatively impact prenatal physical activity levels (9), as many pregnant women are limited by lack of gym access and/or safe places to exercise, financial constraints, and/or increased childcare responsibilities for existing children.

Prior to the COVID-19 pandemic, pregnant women reported receiving little or no advice about physical activity during pregnancy from their health care provider (13, 25, 30, 32). The COVID-19 pandemic is undoubtedly having a profound impact on obstetric practices (1). For example, in the United States of America the majority of low-risk pregnancies now have virtual appointments, partners may not be able to attend in-person appointments, and in fact, earlier in the pandemic, partners were also not able to attend deliveries (10). In addition, recent research has shown an increase in maternal psychological concerns as a result of the pandemic, including higher levels or prenatal anxiety and depression (2, 17, 18, 24, 37, 39, 40, 41). Maternal anxiety and depression have been intricately linked to the COVID-19 pandemic. Examples include fears surrounding unclear information regarding vertical transmission of COVID-19 from mother to child, quarantine regulations preventing in-person interactions with social networks (i.e., family and friends), changes in the delivery of healthcare (e.g. increased usage of telehealth), and altered community resources (e.g. gyms, schools, childcare centers all being closed) (15, 19). Given the sudden changes in obstetric practice and maternal health concerns surrounding COVID-19, it is possible that physical activity-related discussions during pregnancy are not prioritized in clinical appointments and possibly occurring even less than pre-pandemic. Physical activity has likely been pushed even further into the background, yet an abundance of evidence has shown that leading an active lifestyle during pregnancy can improve many issues that may be particularly relevant during this time of social distancing and quarantine (e.g. mental health, gestational weight gain) (8, 29). There has been a decrease in birthrate in the United States since 2019 with speculation that the pandemic is a contributing factor (34), and early research on pregnancy and COVID-19 demonstrates a substantial increase in maternal anxiety and depression during the COVID-19 pandemic, but that physical activity has the potential to improve maternal mental health outcomes during the pandemic (9). Thus, it is critically important that providers (and patients) are prioritizing exercise for mental and physical health during the COVID-19 pandemic. The purpose of this qualitative investigation was to explore the current perspectives of prenatal healthcare providers on exercise during pregnancy and the potential benefits this may have on maternal health during the pandemic. In addition, we aimed to identify practical resources for prenatal healthcare providers in order to effectively discuss or prescribe physical activity to their patients.

METHODS

Participants

English-speaking prenatal healthcare providers, actively practicing as a resident or an independent healthcare provider (midwifery or obstetrics) during the physical distancing regulations implemented as a result of the COVID-19 global pandemic, were recruited to

participate between April and July 2020. Eligible participants were recruited through professional networks and were practicing in multiple states including Kentucky, Tennessee, and Texas. Interested participants received an online letter of information to review, and a telephone semi-structured interview was scheduled. Participants provided verbal consent prior to engaging in the study. This study was approved by the Western Kentucky University Institutional Review Board (IRB# 20-290) and complied with the ethical statements for human research as outlined by the International Journal of Exercise Science (21).

Protocol

This study was informed by a qualitative description approach, which seeks to understand and describe the perspectives of the individuals who have experienced the phenomena of interest (5). A qualitative description approach in health research is inductive, whereby the findings describe the participant's subjective experiences (5). Simultaneously, the researcher is also an active participant in the study as their understanding of the participant responses will contribute to the development of the codes when analyzing the data (5). Therefore, the epistemological stance is subjectivism, and a naturalistic perspective is taken as findings are constructed by the knowledge and experiences of both the participants and researchers analyzing the responses.

The objectives of the interviews were outlined a priori and an interview guide was developed. The objectives of the interview and example guiding questions included: 1. Describe the health changes obstetricians perceived were experienced by their pregnant patients as a result of the physical distancing regulations and changes to the delivery of prenatal healthcare (e.g. How do you think physical distancing has impacted your pregnant patients/clients in terms of their health and well-being?), 2. Assess whether prenatal healthcare providers believe physical activity prescription may contribute to improving maternal health during the global pandemic (e.g. What role do you think physical activity during pregnancy could have during physical distancing regulations?), 3. Identify resources healthcare providers would like to have in order to increase prenatal exercise prescriptions and referrals in their practice during the global pandemic (e.g. What resources would you need or like to have in order to promote physical activity to pregnant women during physical distancing measures?).

Before starting the interview, participants were asked a series of demographic questions regarding: age, ethnicity, education, specializations, and professional title. In addition, participants were asked to rank their health status on a five-point Likert scale ranging from 'poor' to 'excellent', and identified on average how many days per week they met physical activity guidelines for 30 minutes of moderate to vigorous intensity exercise. Participants were asked to identify how often they discussed physical activity with their pregnant patients prior to physical distancing measures on a five-point Likert scale ranging from 'never' to 'always'. Finally, they were asked again to identify how often they discussed physical activity with their pregnant patients since the start of physical distancing measures.

Statistical Analysis

One study investigator completed all interviews. Interviews were transcribed verbatim using Trint software (2020 version) and transferred to NVivo (12 Plus) software for analysis. A content

analysis was completed by systematically coding and categorizing data to answer the research objectives (27, 35). Data were categorized to represent responses to the three study objectives: 1. Health changes experienced by pregnant women during the global pandemic, 2. Role of physical activity and the impact on maternal health during the global pandemic, 3. Resources providers would like to have to discuss or prescribe prenatal physical activity during the global pandemic. Two study investigators independently reviewed all transcripts to generate codes to answer the research questions. First, the investigators reviewed the transcripts multiple times to become familiar with the content. During this process, the investigators made general notes to support identifying codes. Once the investigators felt comfortable with the transcripts, referencing their notes, they then assigned potential codes to quotes that would represent responses for the primary research objectives. Both investigators then came together and evaluated their codes to come to a consensus on overarching codes that would represent the responses to the three research objectives outlined above. Demographic data were analyzed by presenting means (standard deviations) and frequencies.

RESULTS

Eight obstetricians and one nurse practitioner/certified midwife participated in the current study (including three residents in their second year of residency training for obstetrics and gynecology). Demographic characteristics are described in Table 1.

Table 1. Participant demographic characteristics.

	Mean ± SD or #of participants (%)
Age (y)	40.4 ± 9.2
Race	
Caucasian	9 (100%)
Gender	
Male	3 (33%)
Female	6 (67%)
Geographic Location of Current Practice	
Tennessee	6 (67%)
Kentucky	2 (22%)
Texas	1 (11%)
Highest Level of Education	
Medical Doctorate	8 (89%)
Doctorate of Philosophy & Nurse Practitioner	1 (11%)
Fellowship Training	
Maternal-Fetal Medicine	2 (22%)
Family Planning	1 (11%)
Not Fellowship Trained	6 (67%)
Length of Time in Practice (y)	11.0 ± 8.0
Self-Reported Current Health Status	
Poor	0 (0%)
Fair	0 (0%)
Good	2 (22%)
Very Good	6 (67%)
Excellent	1 (11%)
Physical Activity Level (days per week)	
0	0 (0%)
1-2	1 (11%)
31	1 (11%)
4-5	5 (56%)
6-7	2 (22%)
How often did they discuss prenatal activity with patients prior to COVID-19	
Never	0 (0%)
Not Often	1 (11%)
Sometimes	3 (33%)
Often	3 (33%)
Always	2 (22%)
How often did they discuss prenatal activity with patients during COVID-19	
Never	0 (0%)
Not Often	1 (11%)
Sometimes	4 (45%)
Often	2 (22%)
Always	2 (22%)

Objective 1 (Health changes experienced by pregnant women during the global pandemic): Codes pertaining to the health changes pregnant women experienced included negative mental health outcomes, increase in fear and confusion surrounding labor and delivery, and increases in problematic behaviors such as pre-pregnancy addictions. Consistently, providers described

noticing an increase in their patients' anxiety levels as a result of the global pandemic. For example, providers noted that pregnant women have unique experiences of anxiety than the general non-pregnant population because they will certainly be exposed to clinical environments during the pandemic, "I think that there certainly is a tremendous amount of fear for all patients. And I think what's unique for pregnant patients is at some point they have to come to the hospital and deliver. So for them, it's literally not going to be possible for them to receive all of their care by telehealth" (OB 6).

Providers reported that although they were able to successfully transition most appointments to virtual modalities, and still offer in-person appointments for women who may have high-risk situations, all patients seem to be more worried than before. For example, obstetricians described patients worrying about lack of support during labour and delivery, "You've been pregnant for nine months and you want your family there, which is completely understandable" (OB 3), "I think the biggest thing is the worry about not having family around during labor. They're all stressed over that." (OB 5). Providers reported fielding many questions about who may accompany women during labor and delivery, changes to birth plans, and explaining the risks associated with coming into the hospital as women feared transmission of COVID-19. Providers recalled difficult experiences asking partners to leave during delivery, and overall could sympathize with their pregnant patient, however they had to prioritize following physical distancing regulations. In addition, providers also described hat pregnant patients had additional causes of anxiety that they likely did not anticipate when planning their pregnancy, such as losing their job, "It's the whole mental aspect of it, the anxiety. You know, I have quite a few patients who literally live paycheck to paycheck or worse. And, you know, they're losing their jobs. They've got a lot of young children at home. And now one or both parents are not working. So the stress of it, I can see, has been just horrible" (OB 1).

Furthermore, providers expressed concern for an increase in substance use and addictions among pregnant patients with pre-existing substance use disorders. Providers said that there was an increase in smoking and alcohol behaviors, and they suggested this is likely related to the increase in anxiety levels and decreased social support following physical distancing. Providers who primarily work in low resource areas said that they worry about relapse, especially as some women had experienced cancellation of in-person addiction support options, "Certainly our patients with a history of substance use disorder or any kind of addiction, we worry quite a bit that this environment is really conducive to relapse, especially if they were working a program that involved in-person meetings and that's not allowed anymore" (OB 2).

Objective 2 (Role of physical activity and the impact on maternal health during the global pandemic): Two main codes were identified for the perceived role of physical activity for improving maternal health during the global pandemic including gestational weight gain management and mental health benefits. As an example, one obstetrician said, "I think probably for mental health reasons, it's probably the most beneficial. Certainly, we'd want folks to prioritize physical activity during pregnancy such that they can have a healthy gestational weight gain. As you know, kind of appropriate for their weight when they begin pregnancy. But I think that we all know that physical activity is really important for mental health as well" (OB

7). Providers said that prenatal physical activity can help manage gestational weight gain and prevent excess weight gain. Due to the physical distancing regulations, providers suggested that women may be engaging in 'bored eating' and may be less likely to attend group fitness activities that they were participating in prior to the pandemic. However, most providers suggested that they believe their participants are engaging in more incidental activity than before, such as walking, due to working from home and the warm weather, "It does seem that they have been able to get out in their neighborhoods or local parks and walk, bike, jog, do online videos more so than they would have if they were physically going into an office" (OB 1). They expressed that the increase in walking will likely support gestational weight management.

In addition, providers stated that they prioritized discussion of prenatal physical activity with their patients as a behavior that will help them improve their overall mood and go outside, "I am strongly advocating continue to exercise. Get outside." (OB 7). Some providers expressed that they have had to discuss with their patients the importance of going outside for a walk and the benefits this will have for their mental health. They said that some of their patients worried about the safety of being outside, however if they live in safe neighborhoods and can distance from other people, obstetricians encourage walking outside. Although the providers were optimistic about encouraging their patients to be active, most also prefaced their responses acknowledging they should discuss the mental health benefits of being active more with their patients, especially with the women who have high levels of anxiety or are at risk for depression, "So I think it could be beneficial for weight gain. I also think it's, you know, it's very beneficial to mental health, although I never really thought of it occurring to me to do that" (OB 5).
Objective 3 (Resources obstetricians would like to have to prescribe or refer prenatal physical activity during the global pandemic): The three main resources providers mentioned would be helpful to increase prescription and referral of prenatal physical activity, especially during the global pandemic, include reference to low cost at-home fitness options, handouts, and online information. The obstetricians said that they would need a tangible and evidence-based resource, such as handouts, they can offer to their patients to take away with them. As an example, one obstetrician said, "Just something that is evidence-based, something that is written to where the majority of patients can understand it, would certainly be helpful so that it just would complement my discussion I think. And could say, hey, here's some literature, here's some evidence or a handout that backs up what we were just talking about" (OB 5).

However, some providers felt that handouts were not an effective strategy to improve health behaviors. Instead, another suggestion was to be made aware of online groups or mobile applications about prenatal physical activity they could refer their patients to, "I don't think I've ever given anyone a handout. And now, they probably would just throw it away like the other handouts I give them. But I do think maybe- I don't know, I know there's a billion apps out there. But if there would be an app where we could, like they could track whatever kind of thing they did, and then we would have access to it quickly" (OB 3). A common thread among all the suggested resources were that they should be low cost, accessible at home, and can provide specific exercise recommendations or routines to follow, "I think if I had an easily accessible document or repertoire of just like body weight activities and physical, like physical activities

that I was familiar with that I could say, hey, here's a list of things that you can do that don't take a bunch of extra time or equipment that you can do at your home. I think that that would be beneficial if I had something like that" (OB 9). A few obstetricians suggested that rather than just recommending types of exercises, if they could suggest videos that offer opportunities for women to be active at home or even in a group setting with other mothers virtually, that would be beneficial in comparison to information alone. They emphasized the importance of ensuring that available resources for women should be low cost, and easily accessible to participate from home without the need for additional equipment.

DISCUSSION

Overall, providers interviewed in the current study perceived their pregnant patients as being negatively impacted by the global pandemic and at higher risk of adverse maternal mental health outcomes. These results are consistent with a number of other studies that have also reported the negative impact that the COVID-19 pandemic has had on the well-being of pregnant women, in particular increasing the risk for anxiety and depression (17, 24, 28, 37, 40, 41). This was likely in part due to the fact that early in the pandemic, rapid adaptations to practices and procedures for labor and delivery units across the world were being made, including prohibiting a support person from accompanying a laboring patient (6), and there was a lack of consensus whether mother/baby separation should be considered to avoid transmission of the virus (12). In addition, providers expressed that social distancing regulations may have increased negative health behaviors, such as more time spent sedentary, substance use, and an increase in caloric intake. Positively, providers perceived physical activity as a mechanism for mitigating adverse outcomes that pregnant women may be at higher risk for during social distancing regulations, including excessive gestational weight gain and negative maternal mental health.

Mounting evidence suggests that pregnant patients are at increased risk for depression and anxiety during the COVID-19 pandemic (9). Importantly, physical activity appears to have a protective effect on maternal mental health (9, 28). One study reported that women meeting physical activity guidelines (i.e. 150 minutes of moderate aerobic physical activity per week) had significantly lower anxiety and depression scores in the midst of the pandemic compared to inactive women (28). Another multi-center study in China found that women typically at a low risk of depression and anxiety during pregnancy were at higher risk during COVID-19 (39). They also found that physical activity was inversely associated with depression and anxiety, independent of the pandemic; suggesting that pregnant women should stay active within self-isolation and protection guidelines (39). Collectively these studies suggest that physical activity may be an important tool in maternal mental health during the pandemic, which is particularly relevant given the high levels of pregnancy and COVID-19-related anxiety reported in other studies as well as reported by obstetricians in the present study.

Another consideration for assisting pregnant women with mental health concerns is social support, which possesses its own set of challenges during a time of social distancing and isolation. Previous research suggests that social support is an essential component for

pregnancy-related physical and psychological health (22). Group prenatal fitness classes are usually popular and offer pregnant women an opportunity to socialize while engaging in physical activity (7). However, due to physical distancing regulations, many programs that women may have been participating in or planned to participate in were cancelled. Strategies that could integrate activity with social support in a socially-distanced environment should be considered (e.g. outdoor exercise classes and/or virtual exercise classes). This suggestion was supported by the healthcare providers in the current study and, in fact, they stated that a resource that would assist them with discussing and prescribing physical activity would be knowledge of low-cost virtual physical activity programs that they could refer their patients to.

Recent work suggests that that emotional eating among pregnant women during COVID-19 is associated with excessive gestational weight gain (41). Excessive gestational weight gain can have negative consequences for both mother and baby including increasing the risk for gestational hypertension and diabetes, labor and delivery complications, postpartum weight retention, problems with breastfeeding, and increased offspring adiposity (16, 23). Obstetric providers in the present study expressed similar concerns for their patients as they mentioned excessive weight gain as a concern during the pandemic. Among the general population, a recent review suggests a number of unfavorable changes in dietary patterns during the pandemic (2), including increasing snacking as a result of boredom (and also coping with negative emotions), paired with increased food being purchased (36). Compounding the problem is the fact that people are more sedentary and spending more time on technology (screen time) than prior to the pandemic (2, 4). Taken together, all of these lifestyle changes as a result of COVID-19 are likely to contribute to increased weight gain and poor health outcomes among the general population and pregnant women alike. Similar to the concern of mental health, physical activity during pregnancy prevents excessive gestational weight gain (38). Once again, a unique opportunity exists to encourage and utilize physical activity to prevent unfavorable outcomes that are especially relevant during the COVID-19 pandemic.

Obstetric providers discussed that pregnant patients were expressing increases in problematic behaviors such as pre-pregnancy addictions including substance use disorders. This is consistent with other concerns of COVID-19 "collateral damage" reported by others providing pre- and perinatal care to women across the globe (31, 37). Reports among non-pregnant populations are suggesting an increase in the relapse of addictive behaviors in an effort to cope with mounting stress during the pandemic (33). A recent comment in Lancet Public Health suggested that because of the home isolation resulting from COVID-19, alcohol consumption among pregnant women may increase, resulting in more cases of fetal alcohol spectrum disorders (31). As physical activity is an effective way to cope with stress during pregnancy, healthcare providers should consider encouraging all patients to be active throughout gestation. Providers in the current study emphasized that they encourage their patients to go outside for a walk as this will assist them with reducing stress levels and potentially prevent unhealthful behaviors. To support healthcare providers with discussing prenatal physical activity with their patients, tangible resources that they could refer women to, such as information hand-outs of fitness apps, would be helpful.

Strengths of the current study include the qualitative description approach applied to the data collection and analysis, which directly informs health research with practical suggestions that can be implemented (5). Additionally, during data analysis, reviewers maintained a journal to inform the development of the codes. Limitations include the lack of generalizability as recruited participants were from a similar region. In addition, the sample size was small however, in line with the qualitative description approach, a small representative sample with in-depth data is accepted (5). The findings from this work may inform larger quantitative and qualitative investigations to identify resources prenatal healthcare providers may need to effectively deliver physical activity recommendations to their pregnant patients, increasing gestational activity levels and improving maternal health outcomes during the global pandemic.

Overall providers expressed that prenatal physical activity has the potential to improve maternal health during the pandemic, including improving mental health and prevention of excessive gestational weight gain. Evidence-based prenatal physical activity guidelines state that prescribing pregnant women exercise during pregnancy should be considered front-line therapy for reducing the risk of pregnancy complications and enhancing maternal physical and mental health (20). Given the unfavorable impact of COVID-19 on lifestyle, it is not only critically important for physical and mental health, but timely to encourage pregnant women to be physically active. Healthcare providers want to be made aware of cost-effective, convenient, and physically-distant strategies, for encouraging physical activity during pregnancy in order to prevent adverse health outcomes as a result of COVID-19 and associated social distancing regulations.

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