



Original Research

Patient and Provider Communication Regarding Exercise during Pregnancy in a Rural Setting

MAIRE M BLANKENSHIP^{#1}, KIM A LINK^{#1} SAMANTHA J HENRY^{†2}, and RACHEL A TINIUS^{#2}

¹School of Nursing and Allied Health, Western Kentucky University, Bowling Green, Kentucky, UNITED STATES; ²School of Kinesiology, Recreation, and Sport, Western Kentucky University, Bowling Green, Kentucky, UNITED STATES

[†]Denotes graduate student author, [#]Denotes professional author

ABSTRACT

International Journal of Exercise Science 13(3): 1228-1241, 2020. Women in rural settings are at increased risk for adverse pregnancy outcomes. One potential way to improve pregnancy outcomes in rural settings is through physical activity promotion. However, given the disparities in prenatal care, women in rural areas may not receive information from their health care provider regarding physical activity during pregnancy. Therefore, the purpose of this study was to examine patient and provider communication in a rural setting (both patients' and providers' perspectives) regarding physical activity during pregnancy. A mixed methods study was performed among patients and providers in an obstetrical practice in a rural setting. During early pregnancy, patients were asked questions about their current physical activity levels and intentions for physical activity during their pregnancy. During late pregnancy, patients completed a survey regarding communication from their obstetric provider about exercise during pregnancy. Providers responsible for the patients' prenatal care were surveyed regarding communication with patients about physical activity. Seventy-one pregnant women and five providers participated. 58.2% of patients reported their provider did not discuss physical activity during pregnancy with them at all. Meanwhile, all providers (100%) reported discussing physical activity with all of their patients. Similarly, only 21.8% of patients reported their provider discussed the benefits of exercise during pregnancy, while 100% of providers reported telling their patients about the benefits of exercise during pregnancy. Our study suggests ineffective patient-provider communication regarding physical activity during pregnancy in a rural setting. Improved communication strategies could reduce disparities in health outcomes among pregnant women in rural settings.

KEY WORDS: Pregnant, physical activity, health care, pregnancy

INTRODUCTION

The American College of Obstetrics and Gynecology (ACOG) recommends regular physical activity during pregnancy to limit excessive weight gain and improve obstetric outcomes (4). Physical activity during pregnancy is safe and effective for improving a number of maternal and infant short and long-term outcomes (6, 7, 22, 24, 26, 36). Despite all of the benefits of exercise, only 23% of pregnant women report exercising in accordance with guidelines recommended by

the ACOG (14). This number is likely to be lower among pregnant women in rural communities as individuals who reside or receive health care in rural settings may be significantly less active (5, 20). In addition, pregnant women report receiving little or no advice about physical activity during pregnancy from their health care provider (11, 29, 32, 34); thus, the scientific evidence supporting exercise during pregnancy does not appear to be translating into the clinical setting and the community. Further, pregnant women report receiving much of their physical activity information from online and media-based sources, which emphasizes the need to address the quality of advice women are receiving, as well as help to guide them towards evidence-based physical activity information (10).

Women in rural areas (i.e. United States communities with a population of 50,000 or less (17)) experience poorer obstetric health outcomes and have less access to health care resources compared to women in urban areas (1, 12). Many rural areas have limited health care providers, especially women's health care providers since only 6.4% of obstetric providers practice in rural areas (1), and 19% of the United States population is considered rural (39). Limited health care in communities that are rural and medically underserved may further perpetuate poor outcomes. In 2014, ACOG released a Committee Opinion to elucidate the problem of health care disparities among rural pregnant women and advocate for ways to reduce disparities and improve outcomes (1). These disparities included self-reported fair or poor health status, cigarette smoking, obesity, and receiving fewer recommended screenings (1). One potential way to improve outcomes among pregnant women in rural settings is through physical activity promotion. However, given the disparities in prenatal care, women in rural areas may not receive information from their health care provider regarding physical activity during pregnancy. Therefore, the purpose of this study was to examine patient and provider communication regarding physical activity during pregnancy from both patients' and providers' perspectives in a rural setting. Identifying communication gaps between patients and providers will provide important insight into areas within obstetric care where future intervention strategies should be implemented with the goal of improving outcomes in rural settings.

METHODS

Participants

The Institutional Review Board (IRB) at the local university approved this study. Written informed consent was obtained prior to participation in the study. Research was carried out in full accordance with the International Journal of Exercise Science's ethical standards (27). Data collection occurred between June 2016 and April 2019.

The participating clinic is located in an urbanized setting that serves multiple surrounding counties that are considered rural. Seven of the eight counties that border the participating clinic are considered rural (<50,000 people), and women in these surrounding counties seek prenatal care at this clinic and deliver at the local hospital, which provides a unique opportunity to study rural women from a broad area through a centrally-located clinic. Recruitment of pregnant participants included placing flyers in prenatal packets delivered to each woman at initiation of

prenatal care at the participating obstetric clinic. Criteria for inclusion in the study were: age 18-44 years old, between 8 and 16 weeks gestation, confirmed singleton viable pregnancy via routine ultrasonography, English speaking, and permission from the patient's OB/ GYN provider to participate. Exclusion criteria included: multiple gestation pregnancy, inability to provide voluntary informed consent, and any medical condition (pregnancy-related or not) that would preclude exercise. Participating providers in the study included five obstetrical (MD) physicians and one advanced practice registered nurse (APRN). The participating clinic is a multispecialty clinic serving the needs of obstetric patients in south central Kentucky. All providers practice in the same office and independently provide care for their patients. Each provider has his or her own staff and a team approach to obstetrical care is not utilized. This is important to note as many prenatal clinics operate on a team-based call schedule; thus, making this clinic unique as the obstetricians still all deliver their own patients whenever possible and provide all prenatal care appointments. Therefore, this environment provides a unique opportunity to study patient-provider interactions as each patient had one single provider throughout their pregnancy and delivery.

Protocol

Participants between 8-16 weeks gestation (early pregnancy) were asked questions about their current physical activity levels and intentions for physical activity during their current pregnancy. A commercial activity tracker (Mi Band, Xaomi) was worn for a week by each participant to record steps per day as part of a larger ongoing study. Paper surveys were provided to each participant and returned to the study team within 7-10 days. At 32-37 weeks gestation (late pregnancy) all participants were asked to complete a survey regarding communication from their obstetric provider about physical activity during pregnancy. All surveys were adapted from previous research conducted in an urban setting by Tinius and colleagues (38). The surveys included both closed and open-ended questions that asked participants about advice they received from providers regarding exercise, including exercises to pursue and avoid, appropriate amounts of exercise, and the risks versus benefits of exercising during pregnancy (for specific questions, see Tables 2 and 4).

After all participants had completed their late pregnancy survey, the participating providers were contacted and asked to complete a paper survey regarding advice they gave to patients/participants during their pregnancy. The survey consisted of six yes/no and open-ended response questions. The topics on the survey included the following, recommended frequency of exercise during pregnancy, benefits of exercise during pregnancy, weight gain during pregnancy, and risks associated with excessive weight gain during pregnancy. Provider questions and responses can be found in Table 3.

Statistical Analysis

Descriptive statistics were used to describe mean and standard deviations of the participants. All data analyses were conducted using IBM SPSS Statistics, Version 25 (Armonk, New York). All data was entered and managed via REDcap® electronic data management system (16). For closed-ended questions, the number and percent of women or providers who responded with each given response were determined. In order to determine key themes and common responses

to open-ended questions, standard qualitative techniques were used (13). This included establishing categories and grouping responses into categories, and using commonly reported categories to determine key themes. Seventy-one women participated in the study during early pregnancy (8-16 weeks gestation). Of the 71 women, 55 completed the patient-provider survey questions during late pregnancy (78.9% retention). Demographic characteristics are shown in Table 1.

Table 1. Demographic Characteristics ($n = 71$).

	Mean \pm SD or # (%)
Age (years)	29.7 \pm 4.8
Pre-Pregnancy BMI (kg/m ²)	26.0 \pm 6.2
Household Income (\$)	78,501 \pm 41,220
Gestation Age - Early Pregnancy (weeks)	12.1 \pm 3.6
Gestation Age - Late Pregnancy (weeks)	33.7 \pm 3.7
Steps (steps per day)	7026 \pm 2996
Current level of Exercise	
None	16 (22.5%)
Once per week	16 (22.5%)
2-3 times per week	24 (33.8%)
4-6 times per week	15 (21.1%)
Everyday	0 (0.0%)
Parity	
Nulliparous	23 (32.4%)
Multiparous	48 (67.6%)
Ethnicity	
Caucasian	70 (98.5%)
Hispanic	1(1.5%)
Education	
High School	7 (9.9%)
Some College	11 (15.5%)
Trade School	2 (2.8%)
College Degree	28 (39.4%)
Graduate Degree	23 (32.4%)

RESULTS

During early pregnancy, patients indicated that they had varying plans for exercising during their current pregnancy; 40.8% of patients planned to exercise more than they had exercised before they were pregnant; 39.4% of patients did not plan to change their exercise levels. Almost 15% of patients reported not having any ideas about exercise levels during pregnancy (i.e. they likely had not even really thought about the topic). In addition, 54.9% of patients reported that their ideas about exercising during pregnancy came from sources other than their obstetrician. These sources included prenatal classes, chiropractors, online resources, and personal beliefs. When surveyed during late pregnancy, 58.2% of patients reported their provider did not discuss physical activity during pregnancy with them at any point; however, 100% of the providers reported discussing physical activity with all of their patients. Similarly, only 21.8% of patients reported their doctor or nurse discussed the benefits of exercise during pregnancy with them;

however, 100% of providers reported telling their patients about the benefits of physical activity during pregnancy. Patient and provider response data can be found in Table 2 (patient) and Table 3 (provider).

Table 2. Health Care Provider Communication with Patients regarding exercise (*n* = 55).

	n (%)
Did your doctor or nurse discuss exercise recommendations for pregnancy with you?	
Yes	23 (41.8%)
No	32 (58.2%)
How often did your doctor or nurse discuss exercise during pregnancy with you?	
Never	28 (50.9%)
First Visit Only	14 (25.5%)
Once per Trimester	9 (16.3%)
Every Single Visit	4 (7.3%)
Did your doctor or nurse discuss the risks of NOT exercising during pregnancy with you?	
Yes	3 (5.5%)
No	52 (95.5%)
Did your doctor or nurse discuss the benefits of exercise during pregnancy with you?	
Yes	12 (21.8%)
No	43 (78.2%)

Table 3. Provider Questions and Responses.

Provider	1	2	3	4	5
Do you discuss exercise recommendations for pregnancy with your patients?	yes	yes	yes	yes	Yes, 40 min 5-6 times per week
How often do you discuss exercise during pregnancy with your patients?	First visit and more if weight gain is inappropriate	First visit then as needed	Throughout the pregnancy	About 3 visits during pregnancy	Usually 2-3 times
Do you discuss the benefits of exercise during pregnancy with your patients?	yes	yes	yes	yes	yes
How much weight do you recommend your patients should gain during their pregnancy?	Depending on weight, but most is 40 pounds gained during pregnancy	Depends on starting weight	20-25 pounds	Normal weight, 30 pounds	I normally recommend 25-30 pounds
How often do you discuss weight and weight gain with your patients?	Every visit	First visit then periodically pending need	Most visits	Most visits	Normally 2-3 times during pregnancy, but more often if overweight
Do you discuss the risks of gaining too much weight during pregnancy with your patients?	yes	yes	yes	yes	In most cases, yes

Patients were asked six open-ended questions regarding advice given by their provider, including exercise type, amount, and risks of not exercising and benefits of exercising during pregnancy (Table 4). Several common themes were noted for the small percentage of women who reported conversations with their provider about physical activity during pregnancy. These patients were encouraged by providers to stay active and continue their pre-pregnancy activity levels. Walking, low-impact aerobics, swimming, yoga, and weightlifting were exercises recommended by providers. Heavy lifting and any exercise that could cause discomfort or harm were discouraged. When providers did recommend specific guidelines for exercise during pregnancy in a small subset of patients, patients reported they were encouraged to exercise between 3 to 7 days per week for approximately 30-45 minutes per day. Patients reported providers stated risks associated with not exercising during pregnancy included increased weight gain and increased risk for gestational diabetes. Patients reported providers stated benefits of regular exercise during pregnancy included weight management, an easier labor and delivery, and generally feeling better during pregnancy.

Table 4. Open-Ended Patient Responses Regarding Provider Advice on Physical Activity during Pregnancy.

Question	Response/s	Representative Quote/s
1. What advice were you given?	The most commonly reported answer was to continue doing what they were already doing. Another common answer was to simply stay active.	<i>"To continue what I was doing before pregnancy as long as I had the energy"</i> <i>"Don't be a couch potato!"</i>
2. What types of exercises were recommended for you to do?	The most common type of exercise patients recalled their provider recommending was walking. Other common responses included swimming, yoga, low-impact aerobics, and weight lifting. Several women also reported their doctor saying they could continue any exercises they were already doing.	<i>"Whatever I am currently doing and modify the further along I get"</i>
3. What types of exercises were recommended for you not to do?	The most commonly reported answer was heavy lifting or anything that caused discomfort.	<i>"Anything that made me uncomfortable or caused me pain".</i>
4. How much exercise was recommended?	Most women that answered this question reported being recommended to exercise between 3-7 days per week for 30-45 minutes. Several women reported that a specific number was not given to them.	<i>"Wasn't a specific recommendation, but was given the okay to continue 5-7 days per week for 30 minutes"</i> <i>"They really didn't say"</i>
5. What were the risks of not exercising during pregnancy as discussed by your doctor or nurse?	The risks mentioned were excess weight gain and gestational diabetes.	<i>"health risks - diabetes, pre-eclampsia"</i>
6. What were the benefits of exercising during pregnancy as discussed by your doctor or nurse?	The benefits listed were improved weight control, easier labor and delivery, and overall feeling better/healthier pregnancy and recovery.	<i>"Smooth delivery and avoiding excess weight gain"</i> <i>"Less health risks/better delivery/recovery"</i>

Note. Only patients who reported their provider discussed physical activity during pregnancy with them answered these questions. Questions 5 and 6 were only answered by patients who answered "Yes" to the following questions from Table 2: Did you doctor or nurse discuss the risks of NOT exercising during pregnancy with you? Did your doctor or nurse discuss the benefits of exercise during pregnancy with you?

DISCUSSION

Findings of this study indicate that while providers appear to value physical activity during pregnancy, and intend to communicate the importance of physical activity during pregnancy with their patients, the majority of participants in this study did not report receiving the intended communication. More than half of patients surveyed in this study reported their provider did not discuss physical activity during pregnancy with them at all during pregnancy, while 100% of providers reported having a discussion about physical activity with all of their

patients. Less than 25% of these patients reported their doctor or nurse discussed the benefits of exercise during pregnancy with them, while all providers reported telling their patients about the benefits of exercise during pregnancy. Our findings were similar to previous studies conducted by Duthie, Drew, and Flynn (11) and Leiferman, Sinatra, and Huberty (21) who noted discrepancies between obstetricians' and patients' perceptions of their clinical interactions pertaining to physical activity during pregnancy. Findings from these studies and the present study suggest that there is a missed opportunity to use prenatal visits as a way to discuss exercise during pregnancy (11).

Leiferman and colleagues found that a major barrier to physical activity during pregnancy was inconsistent information (21). Coiffi et al. report that physical activity information conflicted with other sources (i.e. health care providers, online sources, classes, and personal beliefs) and may not be up-to-date (5). These study findings are consistent with the current study in that 54.9% of patients in this study reported that ideas regarding exercise during pregnancy came from sources other than their provider; thus, it is likely many women are not receiving consistent information about exercise during pregnancy, which could contribute to the low percentage of women who meet recommendations (14).

Since 1985, ACOG has amended its recommendations for physical activity during pregnancy five times (4, 5), which poses a challenge for clinicians who have been in practice for many years and may not like the idea of constantly changing their practice strategies. In fact, research suggests there is a 17-year lag from evidence to use in practice (25), and that physicians may struggle to unlearn outdated evidence in an effort to learn new recommendations (15). Therefore, with constantly changing guidelines, obstetric providers may not be up-to-date on current guidelines for exercise. This was evidenced by responses from the providers in the present study. For example, one provider recommended 40 minutes of exercise for 5-6 days per week, which is not consistent with ACOG guidelines (4). Similarly, the Institute of Medicine recommends that appropriate weight gain during pregnancy be determined based on pre-pregnancy body mass index (30). However, several providers in the present study suggested general weight gain guidelines for all patients (i.e. 20-25 and 25-30 pounds), which is not consistent with the IOM guidelines. This lack of consistent use of evidence-based guidelines may limit physician-led discussions regarding exercise during prenatal visits. Further, results from the present study suggest a lack of specific information given to pregnant patients from providers regarding modes and volumes of exercise during pregnancy (Table 4). With limited or no training in exercise science (9), providers may not feel qualified to educate patients on physical activity requirements (33).

Another potential explanation for inconsistent discussion of physical activity may be due to required components of the prenatal exam relative to limited time allotment. The demands of clinical productivity limit the amount of time a provider can spend with each patient, which can play a significant role in poor patient-provider communication (2). These time constraints during the visit may not allow the opportunity to discuss exercise with the patient. Each visit is specific to the patient's health concerns, and physical activity assessments and prescriptions would require even more time from the provider. Most physicians do not have specific training

in exercise science. Dacey et al. report that while the evidence supports the benefits of physical activity, few physicians integrate exercise into their plan based on lack of training (9).

Although our findings suggest providers may not always discuss physical activity during pregnancy with patients, it is also possible that the providers are discussing physical activity, but patients are not recalling the conversation (at least in some instances). Duthie and colleagues suggested that discrepancies in patient-provider communication could be attributed to patient recall (11). Patients may not remember all parts of provider education that occurred earlier in the pregnancy due to the large volume of information being provided. Pregnancy is an emotional and busy time in a woman's life. Pregnancy can alter brain structure, and potentially impair memory functioning (18). While many women affectionately refer to it as "baby brain", research confirms pregnant women may have memory deficits in daily routines when they are juggling many demands for their attention (8). It is possible providers discussed information about exercise during pregnancy with patients, but the information from providers about exercise during pregnancy was not of high-importance to patients; thus, they did not retain the information (23).

Previous research has found that high-quality, open communication between the provider and the patient is related to improved patient outcomes (2); thus, improving patient-provider communication about exercise during pregnancy is critical. One of the suggestions from ACOG is to consider hiring non-physician health care providers to help with patient-provider communication and assist with patient care (2). Further, it may be beneficial to include not only doctors and nurses on the obstetric care team, but other health care professionals, such as physical therapists or certified fitness professionals (37). These additional experts would allow patients the opportunity to receive all of the information they need without increasing the demands placed on the obstetrician. This idea is similar to the way in which referrals to dietitians are utilized (and reimbursed through insurance) during prenatal care (19).

In 2018, ACOG identified increased challenges to providing individual care during pregnancy (3). These challenges included healthcare costs, availability of the provider, patient wait times, and limited time for education and support. An alternative model proposed included group prenatal care. This care model was designed to increase opportunities for education and offer social support while continuing to screen for risks and provide prenatal physical assessments. Research by ACOG found that patients showed high levels of satisfaction in the group care model, measurable outcomes shared similar results to individual care models, and there were improved outcomes among African American women and women in the military (3). A group care model could be another potential way to more effectively incorporate conversations regarding exercise during pregnancy into prenatal care.

In addition to making changes to prenatal healthcare delivery, patients also need to be encouraged to ask questions and be involved in their own prenatal care. A key factor that may encourage patient-provider communication regarding exercise is the patient expressing interest and beginning the conversation about exercise by asking the provider questions about exercise

during pregnancy (35, 40). Patients should always be encouraged to ask questions about important topics pertaining to pregnancy, such as exercise.

Generalizability of results is limited due to the use of a single obstetrics clinic; therefore, results are not representative of all pregnant women and obstetricians in the U.S. The study population was predominately Caucasian, with greater than 70% of the patients having college and graduate degrees. The sample in this study may be reflective of participant recruitment (i.e. women who chose to participate may have been more active, have higher levels of education, etc. than the women who opted not to participate). Therefore, these data should not be generalized to other settings. Further, not all study participants lived in a rural community; however, all participants received care in a practice that provides care for women in rural settings, and thus, results of this study are likely a strong representation of overall care that is provided to pregnant women in this practice. To elaborate, it is very likely that the providers are giving women from rural counties the same advice regarding exercise during pregnancy that they reported giving to women included in the present study. In fact, with some of the women in the present study having higher socioeconomic status and education levels, and likely being healthier than women in the surrounding rural communities, it is possible the patient-provider communication regarding exercise during pregnancy investigated in the present study was actually better than what could be expected between providers and rural-dwelling women. In other words, the lack of patient-provider communication was likely under-reported in the study due to not all women living in rural areas. This could be due to the fact that pregnant women who live in the surrounding rural areas would have even less interaction with providers and may be even less likely to ask questions about physical activity. In addition, providers may not view exercise conversations with rural women as a priority since they may have other serious health disparities to address. Further research is needed to include women who are not represented in this study, such as those that are culturally and linguistically diverse. This could be achieved by inviting other provider groups in the area to participate in future studies, and to broaden the inclusion criteria to non-English speaking participants by offering interpreter services.

Another limitation of this study was asking providers for general responses to patients regarding their communication about exercise during pregnancy, instead of asking about specific responses they provided to specific patients. Thus, the researchers could not account for variations in conversations between each provider and each patient. The researchers of this study opted to not survey providers after each patient visit in order to prevent the study questions from influencing providers' care and inserting bias into the study.

A third limitation of this study is the lack of consistency between responses from participants. To elaborate, in Table 2, not all women that answered "No" to the question of whether or not the provider discussed exercise recommendations also responded "Never" to the question of how often exercise was discussed. While we expect these two numbers to be consistent, possible reasons for the difference in percentage of responses between "No" in the first question and "Never" in the second question could be due to slight differences in the wording of the questions regarding the provider communication. One question talked about "exercise recommendations"

and the other talked about exercise more broadly. It is possible this slight difference in wording changed how the women responded to the questions. In addition, a difference between responses was only noted for only four participants (32 participants who said “no” and 28 participants who said “never”, which equated to 58% vs. 51%). Although this small discrepancy existed, the percentages of women who ultimately reported not discussing exercise with their provider were similar, and thus, interpretations of the outcomes of these data were similar. A small discrepancy could be interpreted as a strength of the data. When administering surveys, it is often advisable to ask the same question in a different way to try and ensure researchers are eliciting the most accurate responses. With the exception of the four participants who answered these questions differently, the 51% that answered both of these questions consistently reinforces the finding of a lack of communication between providers and patients.

A fourth limitation of this study may include the use of the Xaomi Mi Band. This commercial fitness device was chosen as a low-cost method to allow tracking of steps via smartphone (versus simply using a pedometer). The data collected for this study was from June 2016 to April 2019. To our knowledge, no research on validity or reliability of the Xaomi Mi Band fitness tracker had been conducted prior to 2016. Since that time, several studies have been conducted to assess the Xaomi Mi Band fitness trackers (28, 31). Paradiso and colleagues specifically reviewed the Xaomi Mi Band and concluded that this tracking device was not appropriate for clinical or research use. However, Xie et al. found the Xaomi Mi Band to be acceptable for measuring simple step counts with a mean absolute percent error (MAPE) of 0.06, placing it in a tie for third best among eight commercial fitness tracking devices (as an example, it was ahead of the Apple Watch 2 which scored a MAPE of 0.42) (41). Therefore, we believe it is an acceptable device to gain a simple measure of physical activity. Further, the focus of the study and the outcomes were not contingent upon accuracy of the Mi Band, furthering the point that we believe it was an acceptable tool to use to gain a general estimate of steps. We believe collecting an objective measure of physical activity was actually a strength of the study as many qualitative studies use subjective/self-reported measurements.

In summary, effective patient-provider communication is critical as it contributes to improved patient outcomes. Our study suggests there is ineffective communication between pregnant patients and their obstetric care provider regarding physical activity during pregnancy in a rural setting. Increased and improved communication between the patient and the provider is important in rural communities, as pregnant women may experience unique health care challenges compared to women in urban areas. Pregnancy is considered a “teachable moment” (29), and intervention strategies to improve the quality of health care and patient-provider communication on important topics, such as exercise during pregnancy, are needed. These intervention strategies are opportunities to improve future health outcomes among women and their infants in rural areas.

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