The Role of Physical Activity on Quality of Life during Pregnancy

Kailey Snyder
School of Health & Kinesiology

PROJECT DESCRIPTION

Prenatal physical activity is associated with numerous physical and mental health benefits for an expecting mother (Melzer et al., 2010). In regard to physical benefits, physical activity is associated with reduced risk of preterm labor, hypertension, gestational diabetes and excessive weight gain (Hammer et al., 2000). In regard to mental health benefits, prenatal physical activity has been linked to a reduction in anxiety and depressive symptoms (Moyer et al., 2016). Despite these benefits, only one in five pregnant women are meeting the American College of Obstetrics and Gynecology’s recommendation of engaging in ≥ 20-30 minutes/day of moderate exercise on most days of the week (Evenson et al., 2004). In 2018, the United States Department of Health and Human Service released the 2018 Physical Activity Guidelines Advisory Committee Scientific Report (PAGAC), which included recommended target areas for future research. One of these target areas involved exploring the influence of physical activity on maternal mental health, especially in regard to perceived quality of life (PAGAC, 2018). A woman’s quality of life during pregnancy is crucial as pregnancy is a time period in which a woman is experiencing unique physical and psychological changes (Kazemi et al., 2017).

The measurement of quality of life during pregnancy has warranted significant research attention in the past decade and typically encompasses three parts; physical, psychological and social (Kazemi et al., 2017; Mazuchova et al., 2017). In general, women’s quality of life during pregnancy is most at risk when they are experiencing poor relationship satisfaction, physical changes that limit their physical activity or fears of childbirth (Mazuchova et al., 2017). In addition, women experiencing psychological disorders (e.g., anxiety), body-image disorders, or sexual intercourse disorders are also at risk for low quality of life perceptions during pregnancy (Kazemi et al., 2017). Researchers have called for a greater investigation into treatments and interventions to support quality of life during pregnancy (PAGAC, 2018). One such way is by being physical activity, a known treatment to improve mental and physical health (Knapen et al., 2015). Little research has explored the influence of physical activity on a pregnant women’s mental health, and the work that has been done focused specifically on depression and anxiety (Davenport et al., 2018). A better understanding of how physical activity influences quality of life during pregnancy would allow researchers to more effectively develop programming to enhance maternal mental health during pregnancy.

To address this gap in the literature, a convergent mixed methods study will investigate if the amount, intensity and/or type of physical activity a woman engages in during pregnancy influences her quality of life. In this convergent design, qualitative data (interviews) will be the main source of information with the addition of quantitative data (surveys, accelerometers) to supplement and validate the qualitative findings (Tashakkori & Teddlie, 2010). Specifically, women will be asked to participate in a semi-structured interview regarding their physical activity and perceptions of their quality of life. In addition, after the interview is complete, they will be asked to wear a fitness monitor (GT9X Actigraph accelerometer) for seven days. Finally, they will be asked to complete an activity diary and quality of life survey at the end of each week for four weeks via an electronic survey link.
METHODOLOGY

Participants. A total of 24 women will be recruited for this study. Through the use of a pre-enrollment survey we will attempt for half of the sample to be meeting physical activity recommendations of ≥ 20-30 minutes/day of moderate exercise on most days of the week and half of the sample to not be engaging in regular physical activity (>2 days per week). Given the convergent qualitative design, qualitative analyses require smaller sample sizes than quantitative as the goal of the research is saturation. Saturation is defined as the point in data analysis in which researchers are no longer uncovering new information (Bowen, 2008). Women will be eligible if they are currently in their second trimester of pregnancy and have permission from the healthcare provider to engage in regular physical activity via the ParMed-X form (Wolfe & Davies, 2003). A number of strategies will be employed to recruit women for this study. These will include distribution of flyers at parent friendly businesses/organizations (e.g., Women, Infants, and Children clinics), parenting events (e.g., baby fairs) as well as related social media groups (e.g., Moms of Omaha). Additionally, we will work with the prenatal/postpartum fitness studio Well Mama, OBGYNs and mother/infant service providers (e.g., Lutheran Family Services, Elite Lactation Professionals, Milkworks, Child Saving Institute, Early Childhood Services, Methodist Women’s Hospital, Omaha Breastfeeding Support, Butterfly Kisses Family Support Services) to receive referrals of interested women.

Qualitative Measures. A semi-structured interview guide will be developed by the student and her faculty mentor. Previous interview instruments will be consulted to develop the guide (Kazemi et al., 2017; Ventegodt et al., 2003; Petrov-Fieril et al., 2014). The interview will focus on the three factors influencing quality of life; physical, psychological and social (LeBlanc et al., 2007). The estimated time to complete the interview is 45 minutes.

Quantitative Measures. Surveys will be utilized to assess quality of life and physical activity. Women will be asked to complete the standard form (SF) 12 to assess quality of life (citation?). This 12-item instrument has been used to evaluate quality of life in pregnant women (Amador et al., 2008; Arizabeleta et al., 2010; Lacasse et al., 2008). To measure physical activity, the Physical Activity Record (PAR) will be utilized. This questionnaire has been tested against objective measures such as pedometers and accelerometers and found to be a valid and reliable tool for pregnant women (Chasan-Taber et al., 2004). Women will be asked to complete these instruments weekly for four weeks via a Qualtrics survey link (Qualtrics, 2013). Finally, women will be given an accelerometer (GT9X; gold standard measurement) to wear on their non-dominant wrist for seven days to objectively monitor their physical activity. These accelerometers will be borrowed from the Physical Activity in Health Promotion lab within the School of Health & Kinesiology.

Data Analysis. For the qualitative data, an inductive content analysis approach will be taken (Krippendorff, 2004). The researcher will transcribe all interviews verbatim and listen to the recordings several times prior to beginning analysis. She will then utilize an open coding strategy by writing notes and headings with the transcriptions. She will then look for similarities in these notes and headings between interviews. This will allow for common themes and subthemes to develop (Petrov-Fieril et al., 2014). She and her mentor will review the themes to discuss any discrepancies. Finally, a third researcher that is unassociated with this research will be brought in for peer debriefing in order to reduce potential biases of the investigator and mentor (Lincoln & Guba, 1985).

For the quantitative analysis, survey data will be analyzed via the scoring protocols associated with the SF-12 and the PAR (Chasen-taber et al., 2004; Windsor et al., 2006). To determine physical activity intensity, data obtained from the PAR will be assigned a metabolic equivalent (MET) value using the compendium of physical activities (Ainsworth et al., 2011). A MET value is used to determine how much
energy an individual is expending by participating in a certain physical activity. The MET values can be seen in Table 1. The PAR data will then be compared with the Actigraph accelerometer data to determine if the objective measure (accelerometer) matches the subjective measure (PAR). If the intensity findings differ we will utilize the accelerometer findings to determine which intensity category women will be classified in; however these discrepancies will be further explored within the statistical analysis.

**Potential Pitfalls.** The primary pitfall of this proposed study involves the recruitment of 25 pregnant women in such a short time frame. However, the investigator previously conducted a research study at the prenatal fitness studio in Omaha that has also agreed to help recruit for this study and was able to recruit 16 pregnant women in under 48 hours and execute the study protocol as written. In addition, the ability to compensate women for their time will support recruitment efforts.

**Projected Project Timeline/Student & Faculty Roles**

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
<th>Student Role</th>
<th>Faculty Role</th>
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<tbody>
<tr>
<td>May 2019</td>
<td>• Submit IRB</td>
<td>• Write IRB</td>
<td>• Submit IRB</td>
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<tr>
<td></td>
<td>• Recruit subjects</td>
<td>• Recruitment</td>
<td>• Supervise recruitment</td>
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<tr>
<td></td>
<td>• Prepare study materials</td>
<td>• Prepare study materials</td>
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<tr>
<td>June 2019</td>
<td>• Distribute accelerometers</td>
<td>• Distribute accelerometers</td>
<td>• Supervise data collection</td>
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<td></td>
<td>• Send weekly surveys</td>
<td>• Send weekly surveys</td>
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<td></td>
<td>• Conduct Interviews</td>
<td>• Conduct Interviews</td>
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<tr>
<td>July 2019</td>
<td>• Data analysis</td>
<td>• Analyze data</td>
<td>• Assist in data analysis</td>
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<tr>
<td></td>
<td>• Manuscript/grant preparation</td>
<td></td>
<td></td>
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<tr>
<td>August 2019</td>
<td>• Manuscript/grant submission</td>
<td>• Prepare manuscript/grant submission</td>
<td>• Oversee manuscript/grant submission</td>
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**Previous Funding.** I have received UCRCA award ($360) and one GRACA award ($5,000) previously. The UCRCA award supported my recruitment efforts for my thesis study exploring exercise motivation in college students. The GRACA award was utilized for a study entitled: Mental & Physical Support (MAPS) for Moms. This was a pilot investigation to determine the feasibility of a physical activity intervention for pregnant mothers. Specifically, the program combined group exercise classes with educational speakers and group discussions. Within this work we determined that the program format was extremely well-received however attendance was poor which suggests format alterations are needed prior to a main-scale trial. This study resulted in a manuscript that has been accepted to the Journal of Integrative Health Research (Snyder & Dinkel, 2018). The present study will focus on the same special population of pregnant women as this has become an area of expertise for the researcher and her mentor. In addition, the researcher will be able to utilize similar recruitment strategies for the proposed study based on connections established during the previous study.

<table>
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<tr>
<th>Physical Activity Level</th>
<th>MET</th>
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<tbody>
<tr>
<td>Light Intensity</td>
<td>&lt; 3</td>
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<tr>
<td>Moderate Intensity</td>
<td>3 to 6</td>
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<tr>
<td>Vigorous Intensity</td>
<td>&gt; 6</td>
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# PROJECT FUNDING PLAN

<table>
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<tr>
<th>Budget</th>
<th>Description</th>
<th>Cost</th>
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<tr>
<td>Summer Stipend</td>
<td>I am requesting $3,750 for my student summer stipend. This will allow me to commit all of my summer time to completing the objectives of this research. I project the instrumentation development, recruitment, instrumentation dissemination and data analysis to take a minimum of 375 hours to complete or 30 hours per week in May, June &amp; July. $10/hour x 375 hours = $3,750.</td>
<td>$3,750</td>
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<tr>
<td>Participant Incentives</td>
<td>I would like to provide a $10 Amazon gift card each week that the women complete the surveys. I would also like to provide a final $10 gift card for completion of the interview for a total of $50 per participant. $50.00 * 25 = $1,250</td>
<td>$1,250</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>$5,000</td>
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References


November 7, 2018

Dear Review Committee,

I am writing to express my support for Kailey Snyder’s application for the Graduate Research and Creative Activity Fund. Kailey is in her third year of Exercise Science doctoral program with an emphasis in Physical Activity. She also received her master’s at UNO and has worked as a graduate assistant for me the past 5 years. Kailey has excelled in both her coursework and her research responsibilities as a graduate assistant. She is one of the top students I have seen come through the program and I fully support her proposal due to her previous research efforts, the viability of the proposed project, and her preparation for the project.

Kailey is a hard worker who strives for excellence. This has been evident in her research efforts. Regardless of the project I have had her work on she has always come through with in recruiting subjects, conducting the study, and disseminating results. For example, when she was previously awarded a GRACA her notice of award did not occur well into the fall semester. However, she was still able to recruit her proposed number of subjects, complete the intervention, and has already published the results in a manuscript. Additional evidence of her abilities as a scholar can be seen by her 6 first-author publications and 5 grant proposals. Locally, she has conducted several presentations to students at UNO and other community organizations.

Kailey and I have thoroughly discussed her current proposal. She has extensive experience recruiting pregnant women and mothers through her previous GRACA and various research studies she has led for me. She has a passion for the field and has several community connections through Well Mama, local pediatricians, and other family friendly organizations/businesses that work with pregnant women. Due to all of this support, I have no doubt she will be able to recruit the proposed number of women and complete the objectives of the proposal. I have also reviewed her methodology and believe this is a great mixed methods approach to beginning to gain knowledge on this important topic. Funding for this research study is imperative though as incentives are a necessary component of ensuring women complete the data collection. Further, she will be coming off a research assistantship and this funding will help her during this transition period.

Kailey’s knowledge and experience through her coursework and research experiences have fully prepared her to conduct this study. As a mother herself, Kailey is great at relating to other mothers and pregnant women. Kailey has demonstrated the utmost in professionalism and compassion. In regards to the methodology, she is well versed in the methods of qualitative research and led or been a part of 5 qualitative studies. Additionally, she has utilized similar surveys and accelerometers for several of the mother/infant studies we have conducted within the lab. As her doctoral mentor I am also invested in helping her execute this study. I will meet with her on a weekly basis to ensure she is on track to complete the study and discuss any barriers that may arise. Additionally I will assist in data analysis as needed. In conclusion, I fully support Kailey’s proposal. Please let me know if you have any additional questions or concerns.

Sincerely,

Danae Dinkel, Ph.D.