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## Correlates of Self-Reported Physical Activity at 3- and 12-Months Postpartum

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### Abstract

**Background**—Postpartum women are encouraged to participate in 150 minutes/week of moderate-intensity aerobic activity, but few women achieve this recommendation. This study sought to identify factors associated with participation in physical activity following pregnancy.

**Methods**—We examined correlates of any self-reported moderate to vigorous physical activity (MVPA) (> 10 minutes/week across all modes) and any recreational MVPA (> 10 minutes/week) among women enrolled in the Pregnancy, Infection, and Nutrition Postpartum study at 3-months (n=667) and 12-months (n=530) postpartum. Potential correlates were identified according to the socio-ecological framework.

**Results**—At 3- and 12-months postpartum, lower odds of participation in any MVPA were associated with lower education, breastfeeding, and minimal emotional support. Low exercise self-efficacy, receipt of advice about physical activity, and warmer seasons were associated with higher odds of any MVPA. For recreational MVPA, lower odds of participation were associated with unmarried status, lower education, employment, low income, preeclampsia, and minimal emotional support. Involvement in child/adult care activities, transportation MVPA, and warmer seasons were associated with higher odds of recreational MVPA.

**Conclusion**—These findings suggest there are several modifiable intrapersonal and interpersonal factors associated with postpartum MVPA that should be considered when developing interventions to help women maintain or increase MVPA after pregnancy.

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## INTRODUCTION

Physical activity has many health benefits for women in the postpartum period, including improved mood, weight loss, and cardiorespiratory fitness.<sup>1, 2</sup> Postpartum physical activity is also associated with decreased anxiety,<sup>3, 4</sup> depression,<sup>3, 4</sup> and urinary incontinence.<sup>4</sup> The American Congress (formerly “College”) of Obstetricians and Gynecologists recommends that pregnant women engage in at least 30 min of moderate-intensity exercise most days of the week in the absence of medical and obstetric complications.<sup>5</sup> Postpartum women are encouraged to resume exercise programs gradually and only when it is physically and medically safe to do so.<sup>5</sup> The time frame for restarting exercise routines after pregnancy varies among women, with some able to resume activities more quickly than others.<sup>5</sup> According to 2008 guidelines developed by the United States (U.S.) Department of Health and Human Services (HHS), weekly participation in at least 150 minutes/week of moderate-intensity aerobic activity is recommended for pregnant and postpartum women who are not already highly active.<sup>1</sup>

Despite these reported health benefits and recommendations, few women engage in the recommended levels of physical activity during and after pregnancy. Between 1999 and 2006, approximately 23% of U.S. pregnant women reported meeting the U.S. HHS guidelines.<sup>6</sup> During the postpartum period, women may return to the levels of physical activity achieved during early pregnancy,<sup>7</sup> but they may be less physically active than they were prior to pregnancy.<sup>8</sup> Several studies have examined the correlates of physical activity during the postpartum period to inform postnatal interventions.<sup>8–13</sup> However, these studies have been limited as sample sizes were relatively small;<sup>8, 9</sup> study populations were restricted to women with recent gestational diabetes mellitus (GDM);<sup>11, 12</sup> physical activity measures often lacked information on other non-recreational modes, duration or intensity;<sup>8, 10–13</sup> and physical activity was only measured at one time point during the postpartum period.<sup>8–13</sup>

To inform the development of interventions aimed at maintaining or increasing physical activity following pregnancy, it is important to understand what factors are associated with physical activity during the postpartum period. The objective of this study was to identify correlates of self-reported total and recreational moderate to vigorous physical activity (MVPA) at 3- and 12-months postpartum among a cohort of women enrolled in the Pregnancy, Infection, and Nutrition (PIN) Postpartum Study.

## METHODS

### Study Population

The PIN Postpartum Study prospectively followed women who were initially enrolled in the third phase of the PIN Study (PIN3). PIN3 participants (N=2006) were enrolled before the 20<sup>th</sup> week of gestation from prenatal care clinics in the University of North Carolina Hospital system. Recruitment occurred from 2001 to 2005, with the last birth occurring in December 2005. Women were eligible for participation in PIN3 if they were English speaking, at least 16 years of age, planning to continue care and deliver at the study site, carrying singleton gestations, and had access to a telephone. Among the 2006 pregnant women enrolled in the PIN3 study, there were 1169 who met the eligibility criteria for the

PIN Postpartum Study (i.e., delivered a singleton live birth between October 2002 and December 2005, did not drop out of the study, completed the first PIN3 interview, continued to live in the study area, and were not pregnant at the time of data collection). Of these women, 231 were further excluded because they had medical constraints, were unreachable, or were greater than 5 months postpartum at the time of recruitment, leaving 938 women to be invited for participation. There were 688 women (73% of the 938 invited for participation) who participated in home visits for data collection at 3-months postpartum and 550 (80%) of these 688 women also participated in a second home visit at 12-months postpartum. The women who did not participate at 12-months postpartum (n=138) included those who were lost to follow-up, moved out of the recruitment area, or became pregnant during the two postpartum visits. In-home interviews occurred from 2003 to 2007, with the last interview occurring in January 2007. Information about the reasons for dropout and assessment of selection bias can be found elsewhere.<sup>7, 14, 15</sup> We further excluded 21 women with more than one pregnancy in the PIN3 and PIN Postpartum studies to remove correlated observations. Our final sample included 667 women at 3-months postpartum (i.e., 688-21) and 530 at 12-months postpartum (i.e., 550-20; one of the 21 women with two or more pregnancies only participated at 3-months postpartum and was not part of the sample at 12-months postpartum). This study was approved by the University of North Carolina at Chapel Hill Institutional Review Board, and each participant provided informed consent.

## Measures

**Self-reported physical activity**—Physical activity was measured using an interviewer-administered in-home questionnaire that assessed the frequency, duration, and mode (e.g., occupational, recreational, transportation, child and adult care, and both indoor and outdoor household activity) of MVPA in which the woman participated in the week prior to the interview. The participant's perception of physical activity intensity was assessed using a modified Borg scale.<sup>16</sup> The questionnaire was administered during the in-home interviews at 3- and 12-months postpartum and provided an estimate of the total number of minutes in the past week of MVPA. For this study, we considered two outcomes of physical activity: any MVPA (across all modes of activity) and any recreational MVPA. Women were categorized as participating in any MVPA if they reported at least 10 minutes per week of "somewhat hard" or "hard or very hard" physical activity in the past week. Similarly, women were categorized as participating in any recreational MVPA if they reported at least 10 minutes per week of "somewhat hard" or "hard or very hard" recreational activity (e.g., walking for exercise, swimming) in the past week. A cut point of 10 minutes was chosen because the U.S. HHS guidelines recommends that moderate- and vigorous-intensity aerobic activity be sustained in bouts of at least 10 minutes to improve cardiovascular fitness and selected risk factors for type 2 diabetes and heart disease among adults.<sup>1</sup>

The validity and reliability of the questionnaire were evaluated in a previous study.<sup>17</sup> Test-retest reliability was assessed among 109 pregnant women who completed the questionnaire twice over the telephone within a 48-hour time period. The measures displayed substantial agreement with intraclass correlation coefficients ranging from 0.56 to 0.84.<sup>17</sup> The criterion validity of the physical activity questionnaire was assessed among 177 pregnant women who kept a structured diary and wore an accelerometer for one week. These women completed

the interviewer-administered questionnaire at the end of the week for comparison. Moderate to substantial agreement was observed when comparing the questionnaire and diary (Spearman correlation coefficients ranged from 0.47–0.69); lower agreement was displayed when comparing the questionnaire and accelerometer (coefficients ranged from 0.16–0.34).<sup>17</sup>

**Correlates**—Potential correlates were identified according to the socio-ecological framework<sup>18</sup> and represented intrapersonal (i.e., individual characteristics) and interpersonal (i.e., social networks and structures) measures that may influence physical activity participation. Intrapersonal measures included: socio-demographics (age, race and Hispanic ethnicity, marital status, education, current employment, income); behavioral characteristics (body mass index or BMI, sleep quality and duration, smoking status, child and adult care MVPA, indoor and outdoor household MVPA, transportation MVPA, work MVPA); reproductive history (number of children aged <18 years in the household, pregnancy-related complications, Cesarean section); infant care (breastfeeding, co-sleeping); psychosocial factors (depressive symptoms, state anxiety, perceived stress), and individual barriers (exercise self-efficacy). Non-recreational modes of MVPA were only assessed as potential correlates of recreational MVPA. Interpersonal measures included receipt of advice about physical activity from a health professional or family member and emotional support from the child's father. We also identified season of interview administration as an environmental factor that may be associated with participation in MVPA. Depressive symptoms were measured by the Edinburgh Postnatal Depression Scale (EPDS),<sup>19, 20</sup> anxiety was measured by the State-Trait Anxiety Inventory (STAI),<sup>21</sup> and perceived stress was measured by the 10-item Cohen Perceived Stress Scale (PSS).<sup>22</sup> Cut points for psychosocial measures were selected based on the scale's recommendation and the perinatal literature.

All items were assessed during in-home interviews at 3- and 12- months postpartum, with the exception of recent pregnancy characteristics (i.e., pregnancy-related complications and cesarean section), which were obtained from medical records. Self-reported race, Hispanic ethnicity, and education were measured once during pregnancy at the time of enrollment into the PIN3 Study.

### Statistical Analysis

Descriptive analyses were conducted to examine participant characteristics at 3- and 12-months postpartum. Logistic regression models were used to estimate odds ratios (OR) for the association between selected correlates and both dichotomous outcomes: any MVPA and recreational MVPA. We used generalized estimating equations with the logit link function, binomial variance function, and exchangeable correlation structure to account for repeated measurements for each woman.<sup>23, 24</sup> Reported p-values are based on the model-based variance estimates. There was no evidence of endogeneity (i.e., correlation between 3-month physical activity outcomes and 12-month correlates, while controlling for 3-month correlates). Stepwise regression with backwards elimination was performed to select an adjusted model. Main effects were retained in the model if p-values were <0.2. Interactions with time (i.e., 3-months vs. 12-months postpartum) were assessed collectively for all

predictors in the final model and remained in the model if the p-value was <0.1. We only considered variables in the final model as being statistically significant if p-values were 0.05.

## RESULTS

### Study population

More than half of women in the study population were aged 30 and older, non-Hispanic white, married, college graduates, employed, and had an income greater than 200% of the poverty level at both time points; at least 25% were obese (Table 1). While recreational MVPA was reported by the largest proportion of participants, other modes of MVPA were less frequent, with 25% or less of the participants reporting participation in child and adult care, indoor and outdoor household, transportation, and work MVPA at each time point.

The majority of women (at least 75% at each time point) did not have selected pregnancy complications (Table 1). A high proportion of women were breastfeeding at 3-months postpartum, whereas a low proportion of women were breastfeeding at 12-months postpartum. At both time points, a low proportion of women reported low exercise self-efficacy (i.e., low confidence in ability to exercise more) or received advice about physical activity while a high proportion reported having a lot of emotional support from the child's father. The postpartum interviews were distributed similarly across all four seasons.

At both 3- and 12-months postpartum, 67% of women participated in any MVPA and 47% participated in recreational MVPA for at least 10 minutes per week (Table 1). At 3-months postpartum, the median (interquartile range or IQR) minutes of MVPA were 0 (0–120) for recreational MVPA and 90 (0–270) for total MVPA. At 12-months postpartum, the median (IQR) minutes of MVPA were 0 (0–120) for recreational MVPA and 94 (0–240) for total MVPA.

### Correlates of any MVPA

In the final model, lower odds of participation in any MVPA at both 3- and 12-months postpartum were associated with lower education levels (less than high school vs. college graduate: OR=0.23, 95% confidence interval, CI, 0.12, 0.45; high school graduate vs. college graduate: OR=0.50, 95% CI 0.30, 0.83; some college vs. college graduate: OR=0.58, 95% CI 0.38, 0.88), current breastfeeding (OR=0.73, 95% CI 0.54, 1.00), and minimal emotional support (some vs. a lot of support: OR=0.54, 95% CI 0.40, 0.73; not much vs. a lot of support: OR=0.46, 95% CI: 0.24, 0.90; none vs. a lot of support: OR=0.91, 95% CI: 0.32, 2.57) (Figure 1). In contrast, higher odds of participation in any MVPA were associated with lower exercise self-efficacy (somewhat vs. very confident; OR=1.12, 95% CI 0.85, 1.47; not at all vs. very confident: OR=2.37, 95% CI 1.38, 4.07), receipt of advice about physical activity (OR=1.40, 95% CI 1.07, 1.83), and warmer seasons (fall vs. winter: OR=1.87, 95% CI 1.31, 2.67; spring vs. winter: OR=1.92, 95% CI 1.32, 2.79; summer vs. winter: OR=2.27, 95% CI 1.57, 3.28). Age, race, marital status, employment, poverty index, BMI, smoking status, sleep quality or duration, number of children aged <18 years in the household, GDM, pregnancy-induced hypertension, cesarean section, co-sleeping with an

infant, perceived stress, anxiety, and depressive symptoms were not associated with participation in any MVPA. No significant time interactions were observed for correlates of any MVPA.

### Correlates of any recreational MVPA

In the final model, lower odds of participation in any recreational MVPA at both 3- and 12-months postpartum were associated with unmarried status (OR=0.54, 95% CI 0.33, 0.91), lower education (less than high school vs. college graduate: OR=0.26, 95% CI 0.10, 0.68; high school graduate vs. college graduate: OR=0.45, 95% CI 0.26, 0.78; some college vs. college graduate: OR=0.67, 95% CI 0.45, 1.00), employment (OR=0.62, 95% CI 0.47, 0.81), lower poverty index (<200% vs. 500%: OR=0.44, 95% CI 0.25, 0.75; 200-<500% vs.

500%: OR=0.71, 95% CI 0.48, 1.07), recent preeclampsia (OR=0.43, 95% CI 0.21, 0.88), and minimal emotional support (some vs. a lot of support: OR=0.65, 95% CI 0.48, 0.88; not much vs. a lot of support: OR=0.48, 95% CI 0.26, 0.91; none vs. a lot of support: OR=1.12, 95% CI 0.40, 3.12) (Figure 2). Higher odds of participation in any recreational MVPA at both 3- and 12-months postpartum were associated with involvement in child/adult care activities (OR=1.58, 95% CI 1.15, 2.18), transportation MVPA (OR=1.91, 95% CI 1.02, 3.59), and warmer seasons (fall vs. winter: OR=1.98, 95% CI 1.40, 2.81; spring vs. winter: OR=1.72, 95% CI 1.21, 2.52; summer vs. winter: OR=2.51, 95% CI 1.75, 3.58). Age, race, BMI, smoking status, sleep quality or duration, indoor and outdoor household MVPA, work MVPA, number of children aged <18 years in the household, GDM, pregnancy-induced hypertension, cesarean section, breastfeeding, co-sleeping with an infant, perceived stress, anxiety, depressive symptoms, exercise self-efficacy, and receipt of advice about physical activity were not associated with participation in recreational MVPA. No significant time interactions were observed for correlates of recreational MVPA.

## DISCUSSION

The socio-ecological model provides a framework for understanding the multiple levels of influence (e.g., an individual's characteristics, personal relationships, community, and societal factors) that can promote or hinder a woman's participation in physical activity. This comprehensive approach can help to inform the development of interventions that are more likely to be successful at promoting engagement in physical activity following pregnancy. In this prospective study of postpartum women, we identified several intrapersonal and interpersonal level factors that were associated with participation in any and recreational MVPA during the postpartum period. Many of these factors are amenable to intervention. This information is useful for targeting future interventions towards postpartum women with these characteristics.

Similar to findings from a previous study of postpartum women with GDM<sup>11</sup> and in contrast to prior studies that found an inverse association<sup>13</sup> or no association between education and physical activity in the postpartum period,<sup>8, 12</sup> women in the present study were more likely to be physically active (any MVPA and recreational MVPA) if they were highly educated. Higher educational attainment, in general, is known to be associated with healthier behaviors and better health status.<sup>25</sup> This may be due to family background, greater

resources, and being better informed about health. We also found that postpartum women who were currently breastfeeding were less likely to participate in any MVPA. This may be explained by having less time to exercise or concerns about adverse effects of physical activity on successful breastfeeding.<sup>26</sup> To our knowledge, no prior studies have assessed breastfeeding as a correlate of postpartum physical activity. In contrast to previous studies,<sup>11, 12</sup> women in the present study were more likely to participate in any or recreational MVPA if they had low exercise self-efficacy. This finding may suggest reverse causality such that very active women do not think they can participate in any more physical activity beyond what they are already doing.

There were several intrapersonal factors associated with participation in recreational MVPA that were not associated with any MVPA. In contrast to one previous study,<sup>12</sup> women in the present study were less likely to participate in recreational MVPA if they were unmarried. Two theories have been proposed for explaining the associations between marriage, healthier lifestyles, and better health outcomes in the general population, including marriage protection (i.e., married individuals have more resources and support) and marriage selection (i.e., healthier individuals get married and stay married).<sup>27</sup> These theories are helpful for explaining the associations observed in our study, such that married postpartum women may be healthier and have more partner support and economic resources to participate in recreational MVPA than unmarried women. Similar to previous studies<sup>10, 13</sup> and in contrast to one study,<sup>12</sup> women in the present study were less likely to participate in postpartum recreational MVPA if they were employed. This is likely due to the lack of non-working time available for women to participate in leisure activities while they balance work and family in the postpartum period.

We also found that postpartum women who had a low poverty index were less likely to participate in recreational MVPA. Low-income women may lack the resources and support needed to lead a physically active lifestyle. In addition, the neighborhoods in which low-income families live often lack recreational facilities and parks,<sup>28, 29</sup> thus creating environmental barriers to physical activity in these households. Women with preeclampsia during the PIN3 Study pregnancy were also less likely to participate in recreational MVPA during the postpartum period. Physical activity is a known protective factor for preeclampsia.<sup>30, 31</sup> Thus, our finding may suggest reverse causality such that women who were less active during pregnancy may be more likely to develop preeclampsia and less likely to participate in recreational MVPA during the postpartum period. In the present study, postpartum women who participated in child/adult care (e.g., playing with children) or transportation (e.g., walking to work) MVPA were more likely to participate in recreational MVPA. Women who maintain a physically active lifestyle in several areas of their life (i.e., at home and on the road) may be more likely to engage in recreational activities. To our knowledge, no prior studies have assessed non-recreational modes of MVPA as correlates of recreational MVPA in the postpartum period.

Few studies have examined interpersonal correlates of physical activity during the postpartum period<sup>9, 11, 12</sup> and even fewer have explored environmental or policy level characteristics.<sup>26, 32</sup> Similar to our finding that postpartum women were less likely to participate in any or recreational MVPA if they had little or no emotional support from the

child's father, prior studies reported that women were more likely to be physically active if they had support from family or friends<sup>11, 12</sup> and a spouse or partner.<sup>9</sup> Although these other studies did not assess advice about physical activity, the present study found that women were more likely to participate in any MVPA if they received physical activity advice from a health professional or family member. These findings underscore the importance of social support, either in the home environment or during physician visits, for encouraging postpartum women to participate in physical activity. This factor may be the most amenable to intervention following pregnancy.

### Strengths and limitations

The strengths of this study include the prospective cohort design, access to medical records, and detailed information on a number of potential correlates. Also, correlates were identified according to the socio-ecological framework, thus allowing us to address multiple levels of influence on physical activity participation. Due to the prospective design and the collection of information at two time points, we were able to examine time interactions for all correlates in our models.

This study has limitations. Physical activity measures were self-reported and are subject to misclassification from errors in recall. However, the questionnaire has evidence for both validity and reliability.<sup>17</sup> These measures may also reflect different recall periods (one week recall for physical activity) as compared to other variables that were included in the study (e.g., one month recall for sleep measures and perceived stress). While we assessed almost thirty potential correlates, there are likely several other variables that could have been considered but were not measured. The socio-ecological framework guided our selection of potential correlates, but they were primarily intrapersonal and interpersonal level factors. Future studies should explore community and policy levels of this framework. Model selection was based on a p-value cut-off, thus introducing the potential for bias as small associations may be less likely to achieve significance while significant associations may be overestimated.<sup>33</sup>

The generalizability of this study may be limited, as the women were recruited from one clinic in central North Carolina and likely do not represent the general population. Participation in MVPA, reported individual and interpersonal characteristics, and the observed associations between these measures may differ from those in the general population. In addition, the women were not necessarily representative of the original pregnancy cohort due to attrition and being excluded for having a subsequent pregnancy before 12-months postpartum or other factors, thus selection bias may affect our results.

### CONCLUSION

This study addresses the potential for improving participation in MVPA after pregnancy by identifying intrapersonal and interpersonal correlates associated with being physically active during the postpartum period. This information should be considered when developing interventions to help postpartum women maintain or increase physical activity. In particular, interventions should focus on increasing postpartum women's involvement in other non-recreational modes of MVPA (e.g., child/adult care or transportation MVPA), encouraging



more health professionals and/or family members to provide advice to women about participating in physical activity or exercise, and improving postpartum women's emotional support systems. Additional research is needed to better understand which environmental and policy level factors may also influence physical activity behavior of postpartum women.

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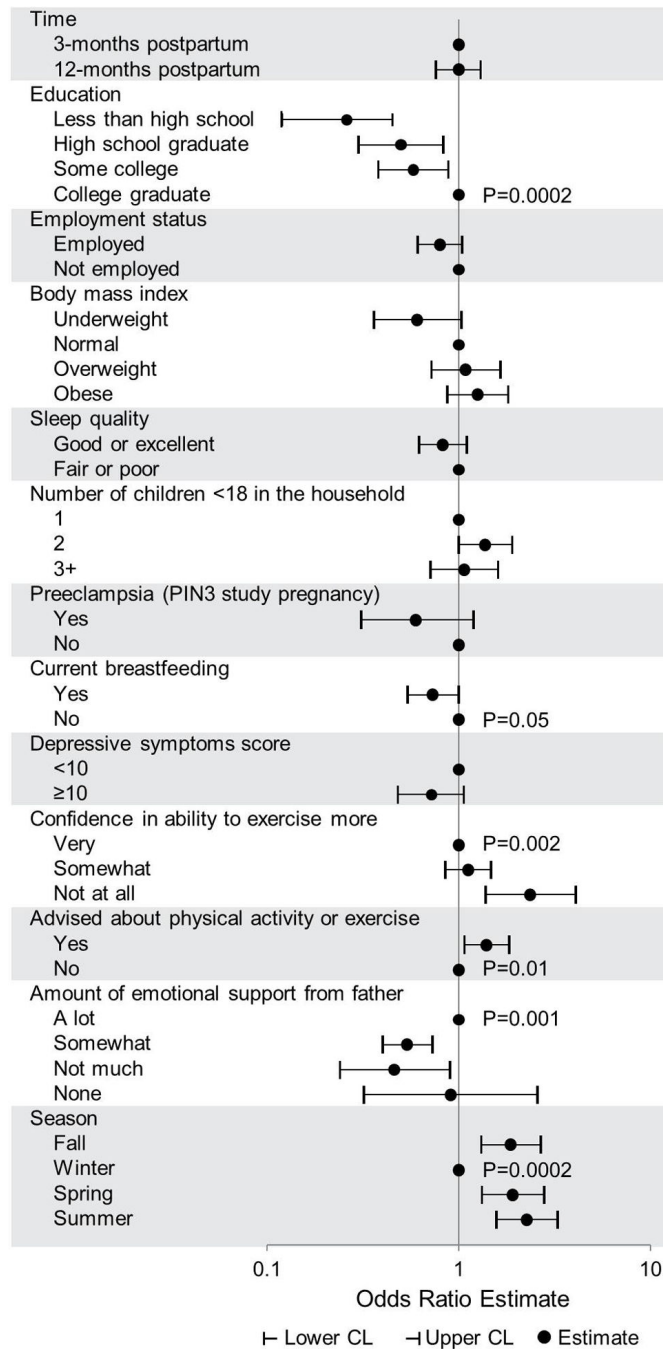
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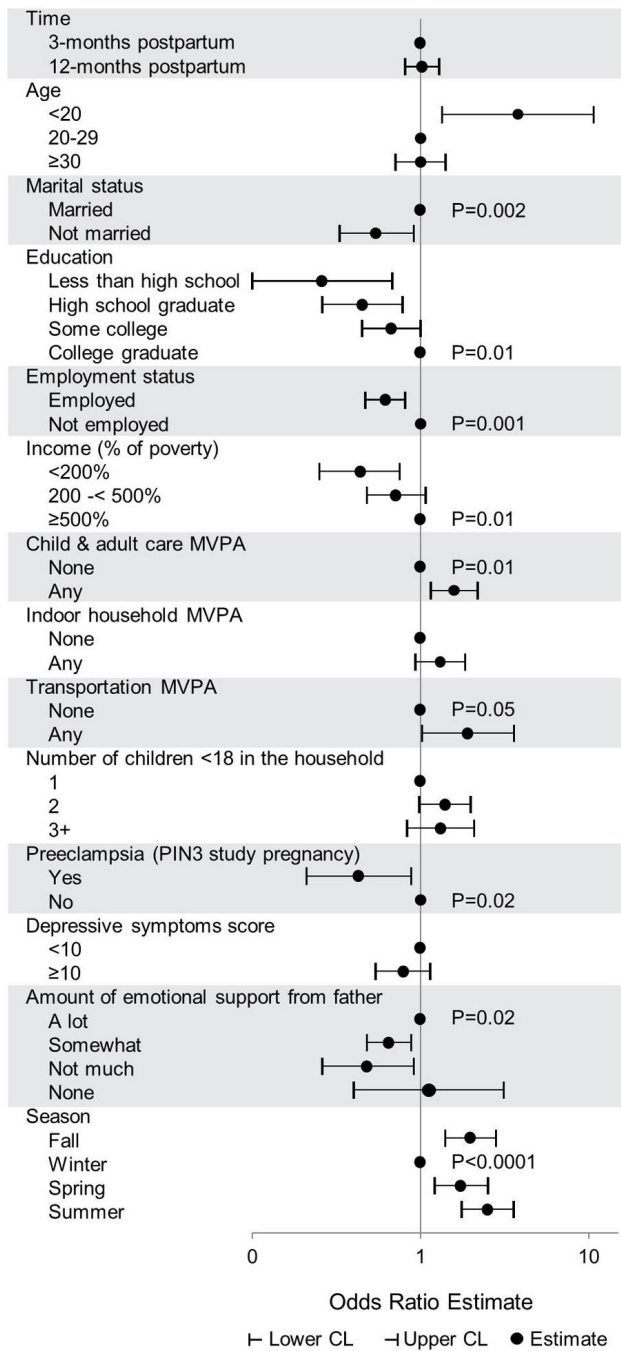
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**Figure 1.** Correlates of any MVPA among postpartum women in the Pregnancy, Infection, and Nutrition Postpartum Study. Correlates were identified from a multivariable analysis and variables were selected into the final model if p-values <0.2, while adjusting for all other variables. P-values were estimated from a group test of all coefficients simultaneously and are presented at the referent level for the variable. Only p-values  $\leq 0.05$  are shown. Abbreviations: MVPA, moderate to vigorous physical activity; PIN3, third phase of the Pregnancy, Infection and Nutrition Study.



**Figure 2.** Correlates of any recreational MVPA among postpartum women in the Pregnancy, Infection, and Nutrition Postpartum Study. Correlates were identified from a multivariable analysis and variables were selected into the final model if p-values <0.2, while adjusting for all other variables. P-values were estimated from a group test of all coefficients simultaneously and are presented at the referent level for the variable. Only p-values 0.05 are shown.

Abbreviations: MVPA, moderate to vigorous physical activity; PIN3, third phase of the Pregnancy, Infection and Nutrition Study.

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**Table 1**

Characteristics of postpartum women in the Pregnancy, Infection, and Nutrition Postpartum Study

	<u>3-Months Postpartum</u>		<u>12-Months Postpartum</u>	
	n	%	n	%
<b>Overall</b>	667		530	
<b>Socio-demographics</b>				
Age				
<20	18	2.7	6	1.1
20–29	243	36.4	162	30.6
30	406	60.9	362	68.3
Race & Hispanic ethnicity				
Non-Hispanic white	499	75.2	408	77.4
Non-Hispanic black	99	14.9	66	12.5
Non-Hispanic other	34	5.1	29	5.5
Hispanic	32	3.2	24	4.6
Missing	3		3	
Marital status				
Married	542	81.3	449	84.7
Not married	125	18.7	81	15.3
Education				
Less than high school	36	5.4	18	3.4
High school graduate	81	12.1	63	11.9
Some college	115	17.2	87	16.4
College graduate	435	65.2	362	68.3
Employment status				
Employed	353	52.9	334	63.0
Not employed	314	47.1	196	37.0
Income (% of poverty)				
<200%	196	29.7	119	22.7
200 –< 500%	344	52.0	294	56.0
500%	121	18.3	112	21.3
Missing	6		5	
<b>Behavioral characteristics</b>				
Body mass index				
Underweight	28	4.2	51	9.9
Normal	332	49.9	262	50.9
Overweight	106	15.9	75	14.6
Obese	200	30.0	127	24.7
Missing	1		15	
Smoking status				
Yes	69	10.3	49	9.2
No	598	89.7	481	90.8

	<u>3-Months Postpartum</u>		<u>12-Months Postpartum</u>	
	n	%	n	%
Sleep quality				
Good or excellent	387	58.0	329	62.1
Fair or poor	280	42.0	201	37.9
Sleep duration				
Short (<7 hours)	229	34.3	143	27.0
Normal (7–8 hours)	369	55.3	333	62.8
Long (>=9 hours)	69	10.3	54	10.2
Child & adult care MVPA				
None	502	75.3	391	73.8
Any	165	24.7	139	26.2
Indoor household MVPA				
None	539	80.8	443	83.6
Any	128	19.2	87	16.4
Outdoor household MVPA				
None	623	93.4	487	91.9
Any	44	6.6	43	8.1
Transportation MVPA				
None	634	95.0	507	95.7
Any	33	5.0	23	4.3
Work MVPA				
None	599	89.8	482	90.9
Any	68	10.2	48	9.1
<b>Reproductive history</b>				
Number of children aged <18 years in the household				
1	316	47.4	254	47.9
2	239	35.8	196	37.0
3+	112	16.8	80	15.1
Gestational diabetes (PIN3 study pregnancy)				
Yes	30	4.5	27	5.1
No	635	95.5	502	94.9
Missing	2		1	
Pregnancy-induced hypertension (PIN3 study pregnancy)				
Yes	167	25.1	139	26.3
No	498	74.9	390	73.7
Missing	2		1	
Preeclampsia (PIN3 study pregnancy)				
Yes	28	4.2	23	4.3
No	637	95.8	506	95.7
Missing	2		1	
Cesarean section (PIN3 study pregnancy)				

	<u>3-Months Postpartum</u>		<u>12-Months Postpartum</u>	
	n	%	n	%
Yes	206	31.0	165	31.2
No	459	69.0	364	68.8
Missing	2		1	
<b>Infant care</b>				
Current breastfeeding				
Yes	427	64.0	135	25.5
No	240	36.0	395	74.5
Co-sleeping with infant				
Yes	168	25.2	104	19.6
No	498	74.8	426	80.4
Missing	1		0	
<b>Psychosocial factors</b>				
Perceived stress score				
<11	226	33.9	181	34.2
11–16	250	37.5	193	36.4
17	191	28.6	156	29.4
State anxiety score				
<29	351	52.6	262	49.4
29–39	250	30.4	182	34.3
39	191	16.9	86	16.2
Depressive symptoms score				
<10	553	82.9	458	86.4
10	114	17.1	72	13.6
<b>Barriers/external influences</b>				
Confidence in ability to exercise more				
Very	369	55.4	273	51.7
Somewhat	251	37.7	204	38.6
Not at all	46	6.9	51	9.7
Missing	1		2	
Advised about physical activity or exercise				
Yes	242	36.3	137	25.9
No	425	63.7	393	74.1
Amount of emotional support from the child's father				
A lot	454	70.3	334	65.9
Somewhat	159	24.6	138	27.2
Not much	21	3.3	28	5.5
None	12	1.9	7	1.4
Missing	21		23	
Season				
Fall (September–November)	86	27.9	139	26.2



	<b><u>3-Months Postpartum</u></b>		<b><u>12-Months Postpartum</u></b>	
	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>
Winter (December-February)	145	21.7	118	22.3
Spring (March-May)	145	21.7	129	24.3
Summer (June-August)	191	28.6	144	27.2
<b>Physical activity outcomes</b>				
Total MVPA (all modes of activity)				
None	218	32.7	170	32.1
Any	449	67.3	360	67.9
Recreational MVPA				
None	353	52.9	282	53.2
Any	314	47.1	248	46.8

Abbreviations: MVPA, moderate to vigorous physical activity; PIN3, third phase of the Pregnancy, Infection and Nutrition Study