

## *Physical Activity and Postpartum Well-Being*

Carolyn M. Sampsel, RNC, PhD, FAAN, Julia Seng, CNM, MS,  
SeonAe Yeo, RN, PhD, Cheryl Killion, RN, PhD, Deborah Oakley, PhD

**Objective:** To describe reported patterns of postpartum physical activity and to identify benefits or risks associated with postpartum physical activity at 6 weeks postpartum.

**Design:** Secondary analysis of longitudinal data collected prenatally and postpartum in a study of obstetric outcomes at a midwestern tertiary-care center and its ambulatory satellite and hospital clinics.

**Participants:** One thousand three women completed a questionnaire at the 6-week postpartum clinic visit. Mean age was 29.7 years, and mean education level was 15.3 years.

**Variables of Interest:** Participation in vigorous exercise, change in postpartum activity level, postpartum weight retention, infant feeding method, maternal postpartum adaptation, and participation in activities for fun.

**Results:** Nearly 35% reported doing vigorous exercise with a modal frequency of three times per week. More active women had retained significantly less weight (8.6 lb [3.9 kg]) than their less active counterparts (11.3 lb [5.1 kg]). Vigorous exercisers demonstrated a consistent pattern of better scores on measures of postpartum adaptation and were more likely than nonexercisers to participate in fun activities, such as socializing, hobbies, and entertainment. Breastfeeding was not adversely affected by vigorous exercise.

**Conclusions:** These exploratory results indicate that physical and psychologic benefits may accrue to postpartum women who are able to exercise vigorously and avoid decreasing their usual level of activity. A prospective randomized test of this relationship is warranted. Although positive outcomes of physical activity have been dem-

onstrated in the population at large, exercise has rarely been an element in postpartum care plans. Nurses who care for women after childbirth should assess women's exercise goals and support them in their desired activities. *JOGNN*, 28, 41-49; 1999.

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Regular physical activity is a recognized factor in the promotion of lifelong health. Women are less likely than men to engage in vigorous, regular exercise, and their exercise programs may be further compromised by childbearing. Specifically, health care providers rarely incorporate women's exercise goals into the postpartum care plan and little information is available to guide postpartum fitness activities.

It is likely that exercise plays as crucial a role for women in the postpartum year as at any other time across the lifespan. Given the contribution of physical activity in overall well-being, it is equally likely that less active postpartum women will experience lower levels of well-being than those who are more active, but this has not been previously examined. Knowledge about the effect of childbearing on levels of physical activity and about potential physical and psychosocial benefits of exercise to the postpartum woman is sparse. More information is needed if effective evidence-based care plans are to be developed. The purposes of this exploratory investigation were to describe reported patterns of postpartum physical activity and to identify associated benefits or risks.

## Related Literature

The National Institutes of Health (1995) consensus statement on physical activity and cardiovascular health and the report of the U.S. surgeon general on physical activity and health (U.S. Department of Health and Human Services [USDHHS], 1996) make a persuasive evidence-based case for the contribution of physical activity to overall health and well-being. Higher levels of physical activity are associated with decreased prevalence of cardiovascular disease, colon cancer, noninsulin dependent diabetes, and overweight. Epidemiologic evidence demonstrates lower mortality rates from all causes at all age levels for more active persons (Kaplan, Seeman, Cohen, Knudsen, & Guralzik, 1987; Lindsted, Tonstad, & Kuzma, 1991; Paffenbarger, Lee, & Leung, 1994). Physical activity levels also are linked to improved psychosocial well-being. Not only have programs of exercise proven to be effective therapy for diagnosed clinical depression (North, McCullagh, & Tran, 1990), but regular physical activity also has been positively associated with increased general psychosocial well-being in nonclinical populations (Cramer, Nieman, & Lee, 1991; King, Taylor, & Haskell, 1993). A prospective study found that participation in little or no recreational physical activity predicted the development of depression in those with relatively good physical and mental health at 8-year follow-up (Farmer et al., 1988). The effects of physical activity on decreased symptoms of anxiety and depression and on increased positive mood and general well-being are stronger among women than men (Stephens, 1988; Willis & Campbell, 1992). Despite the recognized risk of dysphoric mood in postpartum women (Beck, 1993; Campbell & Cohen, 1991), no literature was found that examined the effect of fitness activity on postpartum psychosocial well-being. Although no literature was found about postpartum exercise and psychosocial well-being after childbirth, such positive effects of exercise have been reported in pregnancy and among women in general (Artal Mittlemark, Wiswell, & Drinkwater, 1991; North et al., 1990; Stephens, 1988).

At all ages, women are less likely than men to participate in vigorous physical or regular leisure time exercise (USDHHS, 1996). Social factors provide some explanation for this gender difference. Historically, participation in vigorous exercise was viewed as unfeminine; women were trained to depend on assistance from men rather than to develop their own physical prowess (Tavris, 1992). The devaluation of physical activity for women may have contributed to decreased self-efficacy, a particular concern in postpartum women. MacKinnon (1987) has suggested that discouragement of vigorous activity for women is disempowering. Thus, physical activity is particularly important to women not only for

the positive effects on physical and emotional health but for the development of an empowered sense of self.

**P**hysical activity is particularly important to women because it promotes physical health, psychosocial well-being, and an empowered sense of self; however, knowledge about the effects of postpartum exercise is sparse.

Once a woman becomes pregnant, the issue of exercise is further complicated by concerns for fetal health. Childbearing is a time of great social pressure to put the needs of the fetus or newborn above the personal needs of the mother. This is demonstrated in the literature about exercise during pregnancy. In that literature the primary focus of research has been on the impact of maternal physical exertion on the developing fetus, with little study of exercise benefits for women. Society in general tends to see the pregnant woman primarily as a carrier whose duty is to provide a safe haven for her growing fetus. Few useful guidelines are available for the pregnant woman who wishes to maintain a program of vigorous exercise (Yeo, 1994).

Similarly, little is known about maternal exercise during the postpartum, a time when the continuation of a personal fitness program may be jeopardized by the demands of physiologic changes, maternal adaptation, and child care. In its technical bulletin *Exercise During Pregnancy and the Postpartum Period*, the American College of Obstetricians and Gynecologists (ACOG) (1994) focuses almost entirely on exercise during pregnancy and advises that neither adverse maternal and perinatal outcomes nor positive health benefits have been confirmed as a result of exercise. The only recommendation in the technical bulletin specific to postpartum physical activity is that prepregnancy exercise routines be resumed gradually based on a woman's physical capability. Contemporary obstetric nursing textbooks also put little emphasis on fitness activities in the recommendations for care. For example, one text lists restoration of physical condition as an aim of the 4th trimester, but the single recommendation for exercise is for abdominal toning activities (Olds, London, & Ladewig, 1996). Discussion of postpartum exercise in most texts is limited to activity restrictions, such as avoiding excessive stair-climbing in the 1st week postpartum; the texts give no attention to the resumption of aerobic activities (Pillitteri, 1995; Reeder, Martin, & Koniak-Griffin, 1997). A

notable exception is Varney (1997), who suggests that women who were physically fit during pregnancy and experienced no birthing complications can walk a mile or two by the end of the 2nd postpartum week and commonly return to regular exercise by 3–6 weeks postpartum. However, Varney appears to be making a clinical observation and cites no supporting research.

The mechanisms by which exercise exerts health promotional effects on women, particularly during and immediately after pregnancy, are by no means sufficiently understood. The findings are inconsistent with respect to relationships between maternal exercise and body composition (Carpenter et al., 1990; Evain-Brion, 1994) and effects of exercise on lactation (Dewey, Lovelady, Nommsen-Rivers, McCrory, & Lonnerdal, 1994; Karasawa, Suwa, & Kimura, 1981; Lovelady, Lonnerdal, & Dewey, 1990; Treadway & Lederman, 1986). In a computer search of the literature published since 1964, none was found on the effects of physical activity on postpartum psychosocial well-being.

The relationship of exercise to postpartum weight retention has been studied more thoroughly than other aspects of postpartum well-being. Parker (1994) reviewed the literature on predictors of weight change and in three of five studies found body mass index, a factor closely affected by physical activity level, to be a significant factor in postpartum weight retention. Greater postpartum weight retention in black women than in white women has been attributed, in part, to intake of more total calories, higher proportion of calories from fat, and less physical activity prenatally and postpartum (Boardley, Sargent, Coker, Hussey, & Sharpe, 1995). According to Ohlin and Rossner (1994), women who retained 5 kg or more at 1 year postpartum seldom were physically active in their leisure time when compared with women who retained less weight; a significant negative correlation was demonstrated, so that the more exercise women reported doing, the less weight they retained. It was further concluded that postpartum weight retention was affected more by a change in lifestyle during but primarily after pregnancy than by factors before pregnancy.

A relevant concern clinicians may have is whether vigorous exercise might inhibit lactation. Studies on maternal exercise and lactation have mainly examined the relationship between daily milk production and exercise, but results have been inconclusive. Most studies indicate no difference in the volume of milk (Dewey et al., 1994; Karasawa et al., 1981; Treadway & Lederman, 1986), except for one study (Lovelady et al., 1990) which showed that exercising women tended to have higher milk volume compared to their sedentary counterparts. Dewey et al. (1994) conducted a randomized clinical trial which demonstrated that aerobic exercise performed four or five times per week, beginning 6–8 weeks postpartum, had no adverse effect on volume or compo-

sition of breast milk, maternal body weight or fat loss, infant weight gain, or maternal prolactin levels. In addition, significant improvements in maternal cardiovascular fitness were noted. Because the observation period did not begin until 6–8 weeks postpartum, these findings cannot be applied to women who may wish to resume fitness activities earlier.

The literature cited above suggests that regular postpartum physical activity could have a positive effect on maternal physical and psychosocial health, but insufficient research has been conducted in this area. A consequence of the paucity of definitive research is that there are no clear guidelines about maternal exercise and, as a result, exercise has not been well-integrated into evidence-based nursing interventions for women during the perinatal period. This has led to confusion and discouragement for childbearing women who desire to continue or begin an exercise program. A feminist critique of the literature identified a disproportionate emphasis on the impact of exercise on fetal, as opposed to maternal, well-being. The dearth of literature about the impact of exercise on the physical and psychosocial health of postpartum women may reflect society's heavy emphasis on parenting and lesser concern for women's personal needs. Nurses who work with postpartum women need research results on which to base guidelines for care. Important unexplored questions remain about the changes in exercise patterns that may occur after childbirth and about the impact of exercise on the well-being of postpartum women.

The current study tested the following hypotheses to examine the potential contribution that exercise might make to the well-being of women in the early postpartum:

1. Lower levels of exercise postpartum will be associated with greater weight retention.
2. The practice of vigorous exercise will be associated with greater psychosocial well-being.
3. Participation in vigorous exercise will not affect lactation success.

## Methods

A secondary analysis was conducted of longitudinal data collected prenatally and postpartum in a study of obstetric outcomes at a midwestern tertiary-care center and its ambulatory satellite and hospital clinics (Oakley et al., 1996). The goal of the parent study was to enroll women at low to moderate risk. Registered nurses assessed the risk status of every pregnant woman with a private first prenatal visit to the participating providers between May 1988 and April 1992. Women were excluded from the parent study if they had any of the following conditions: hypertension requiring medication

during pregnancy, serious cardiac disease, chronic renal or lung disease, drug addiction, current alcoholism, seizure disorder requiring medication, psychiatric illness requiring medication, known multiple gestation, or planned cesarean delivery. Participants completed four questionnaires—at the first antenatal visit, at approximately 32 weeks gestation, immediately postpartum (before leaving the hospital), and at 6 weeks postpartum.

### *Participants*

The sample for the secondary analysis reported here was comprised of 1,003 women who completed a questionnaire at the 6-week postpartum clinic visit. They were a subset of 1,381 women who were initially enrolled in the study. Approximately 59.5% were under the care of an obstetrician; the remaining 40.5% were cared for by nurse midwives. Their mean age was 29.7 years, and their mean education level was 15.3 years. They were predominantly white (90.1%), plus Asian (6.9%), and black (3.0%). Primiparae constituted 52.2% of the sample.

Selection bias is an important concern in a longitudinal study. That is, were those who dropped out of the study any different than those who continued and completed the 6-week postpartum questionnaire? To address the selection bias concern we examined the two groups for differences in age, race, marital status, parity, provider, occupation, education, and income. We found that those who completed the 6-week postpartum questionnaire were significantly more likely to be older, white, married, in managerial/professional occupations, and to have more years of education and higher annual incomes. These are typical characteristics of those who tend to be retained in longitudinal studies. No significant differences in parity, provider, or prepregnancy weight were observed.

### *Variables of Interest*

The variables of interest were participation in vigorous exercise, change in postpartum activity level, postpartum weight retention, method of infant feeding, maternal adaptation postpartum, and participation in leisure activities identified as “fun.” With the exception of postpartum weight, variables were measured by the women’s self-report. At 6 weeks postpartum women were asked whether or not they were participating in vigorous exercise, and if so, how frequently. They completed an item that asked whether their current activity was more than usual, less than usual, or the same. Postpartum weight retention was computed as the difference between reported prepregnant weight and weight measured at the time of the 6-week postpartum survey. Infant feeding method as reported by the women was categorized as totally breast, combination breast and bottle, or totally bottle. The Lederman Postpartum Self-Evalu-

ation Questionnaire: Measures of Maternal Adaptation (Lederman, Weingarten, & Lederman, 1981), an instrument with demonstrated reliability and validity, was administered as an assessment of psychosocial well-being specific to the challenges of the puerperium. The questionnaire consists of seven subscales, each containing 10 to 13 items with response options of very much so, moderately so, somewhat so, and not at all, scored from 1 to 4, respectively. Lower scores indicate greater adaptation and, as we assume, greater well-being. The specific subscales, with their respective Cronbach’s alpha, included quality of partner relationship (.92), perception of partner’s participation in child care (.91), gratification from labor and delivery experience (.88), satisfaction with life circumstances (.81), confidence in ability to cope with tasks of motherhood (.85), satisfaction with motherhood and infant care (.82), and support for maternal role from family and friends (.85), all of which reflect an acceptable level of internal consistency (Nunnally, 1978). Women were also asked to indicate activities they did to have fun. The responses to this open-ended question were coded into seven categories: stretching, sleeping, hobbies, sports, socializing, entertainment, and work. The categories were then summed to arrive at the number of activities in which each woman participated.

### *Analysis*

The standard Statistical Package for the Social Sciences (SPSS, 1993) was used to analyze the data. Bivariate analyses used chi-square and two-tailed Student *t* tests and analysis of variance to examine unadjusted differences. Multiple regression techniques were used to account for any effects of demographics or birth circumstances before exploring the relationships of postpartum activity and well-being.

## **Results**

### *Patterns of Postpartum Activity*

Self-reported exercise levels and participation in activities for fun are presented in Table 1. Those who reported doing vigorous exercise indicated a modal frequency of three times per week.

### *Postpartum Activity and Maternal Weight Retention*

Because of the contribution of excess weight to poor physical health, we examined postpartum weight retention. To test hypothesis 1, that less postpartum activity is associated with weight retention, we compared mean weight retained in the groups who reported lower, the same, and higher activity levels at 6 weeks postpartum. The mean weight retained for the total sample at 6

**TABLE 1**  
**Exercise and Activity Levels in Women at 6 Weeks Postpartum**

Category	Response	Percentage
Vigorous exercise	Yes ( <i>n</i> = 349)	34.8
	No ( <i>n</i> = 654)	65.2
	Total = 1,003 <sup>a</sup>	100.0
Level of activity as compared to usual	Less ( <i>n</i> = 544)	54.8
	Same ( <i>n</i> = 290)	29.2
	More ( <i>n</i> = 159)	16.0
	Total = 993 <sup>a</sup>	100.0
Leisure activities listed as fun <sup>b</sup>	Stretching ( <i>n</i> = 715)	71.4
	Hobbies ( <i>n</i> = 428)	47.5
	Socializing ( <i>n</i> = 429)	47.4
	Sports ( <i>n</i> = 429)	47.0
	Entertainment ( <i>n</i> = 347)	38.5
	Work ( <i>n</i> = 53)	5.9
	Sleep ( <i>n</i> = 50)	5.5

<sup>a</sup> Total *n* varies due to missing data on questionnaire.  
<sup>b</sup> Sum of number and percentage is more than 100 since respondents could specify more than one activity.

weeks postpartum was 10.49 lb (4.8 kg). Overall, women with higher levels of activity retained less weight (8.6 lb or 3.9 kg) than their less active counterparts (11.3 lb or 5.1 kg) ( $F = 8.63$ ,  $df = 2$ ,  $p = .001$ ).

### Postpartum Activity and Psychosocial Well-Being

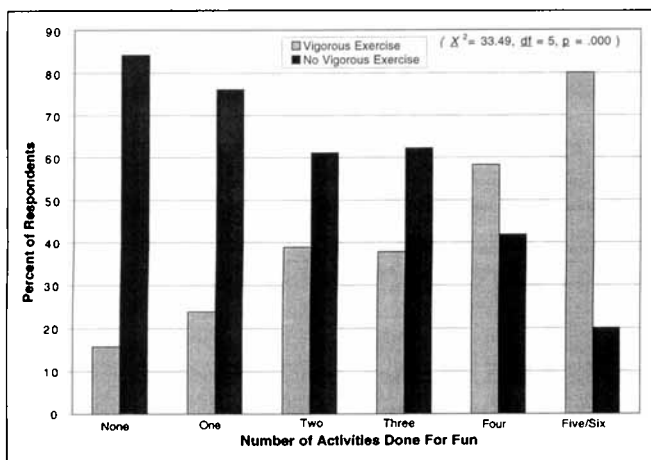
Given the positive effects that physical activity has shown on psychosocial health in the general population, it would be expected that women doing vigorous activity at 6 weeks postpartum would have a higher degree of psychosocial well-being. A synergistic effect of exercise on other aspects of life was predicted for the new mother. Lederman's (1981) postpartum maternal adaptation questionnaire, with its seven subscales, provided a set of opportunities to evaluate psychosocial well-being. We used scores on these subscales to test hypothesis 2, that vigorous exercise will be associated with greater psychosocial well-being. As Table 2 shows, vigorous exercisers demonstrated a consistent pattern of better scores (the lower the score the better the adaptation) across all subscales. The relationship of vigorous exercise and better maternal adaptation was statistically significant for five of the seven subscales. A sixth subscale demonstrated a significant difference when participants were further stratified by both the practice of vigorous exercise and level of postpartum activity in comparison to usual level. This permitted comparison of subscale scores between the most active women, that is, those who were doing vigorous exercise and were more active than usual, and the least active, those not exercising and less active than usual. As is shown in Table 2, an additional significant difference (denoted by \*) emerged for gratification with labor and delivery. Thus, all of the subscales were in the predicted direction, with six of the seven demonstrating statistical significance.

As a further test of hypothesis 2 we used the number of activities women reported that they were doing "for fun" as a proxy for psychosocial well-being. Our reasoning was that women who indicated they were doing more activities for fun would be those with higher

**TABLE 2**  
**Vigorous Exercise and Postpartum Adaptation Scores at 6 Weeks Postpartum (*N* = 1,003)**

	Satisfaction With Partner Participation in Infant Care	Confidence in Tasks of Mothering	Gratification From Labor & Delivery	Quality of Relationship With Partner	Satisfaction With Life Circumstances	Satisfaction With Motherhood	Support From Friend/Family
Vigorous exercise ( <i>n</i> = 349)	14.27	20.58	15.31	16.16	17.55	17.72	18.54
No vigorous exercise ( <i>n</i> = 654)	15.24	21.43	16.33	17.11	18.26	18.34	18.91
<i>t</i> test results	$p = .003$	$p = .018$	$p = .001^*$	$p = .012$	$p = .048$	$p = .028$	<i>ns</i>

Note. The lower the score, the greater the level of satisfaction. \*Significantly different when stratified by vigorous exercise and postpartum activity compared to usual activity.



**FIGURE 1**  
Vigorous exercise and number of fun leisure activities of postpartum women reported at 6 weeks postpartum (N=1,003).

levels of psychologic well-being and energy than those who were having fewer experiences that they characterized as fun. We examined the relationship between participation in vigorous exercise and the number of leisure activities done for fun, excluding participation in sports. We intentionally omitted sports because the correlation between doing vigorous exercise and engaging in sports would be high, biasing the strength of the bivariate relationship. Thus, participation in six leisure activity categories (socializing, entertainment, hobbies, sleeping, working, and stretching) was summed. Table 1 describes the percentages of women participating in each leisure activity. Figure 1 shows the bivariate association of participation in vigorous exercise and the number of leisure activities in which women participated for fun. Vigorous exercisers were significantly more likely to participate in four or more leisure activities that they characterized as fun, for example, socializing, hobbies, and entertainment ( $X^2 = 33.49$ ,  $df = 5$ ,  $p = .001$ ). They were much less likely than were their nonexercising counterparts to indicate participation in no or only a single activity for fun and much more likely to report participation in four or more fun activities.

These results supported hypothesis 2. Participation in vigorous exercise at 6 weeks postpartum was significantly associated with psychosocial well-being, as measured by most of the indices of postpartum adaptation represented on the Lederman subscales and participation in greater numbers of leisure activities for fun.

### **Vigorous Exercise Postpartum and Lactation**

To test Hypothesis 3, the effect of vigorous exercise on breastfeeding, we compared the exercise patterns reported in each feeding group. We posited that if vigorous exercise compromised lactation, then fewer vigorous ex-

ercisers would be found among women who were breastfeeding only. In fact, we found that the distribution of exercisers and nonexercisers was virtually the same whether women were breastfeeding only (approximately 46.5% of both exercisers and nonexercisers), using a combination of breast and bottle feeding (approximately 26.5% in each group), or bottle feeding only (approximately 27%). The statistical test confirmed a nonsignificant relationship, ( $X^2 = 0.6$ ,  $df = 2$ ,  $p = ns$ ). Thus, we concluded that the practice of vigorous exercise was not related to feeding method and had no effect on lactation success at 6 weeks postpartum.

## **Discussion**

The differences between those who completed the study and those who did not worked to increase the homogeneity of the final sample and to make our results less likely. That is, the final sample would be expected to have greater psychologic hardiness and to be less sensitive to an effect of exercise on well-being because of its greater access to resources. Thus, the significant associations that we report are particularly noteworthy. A greater effect size would be anticipated in a more heterogeneous sample.

To assess confounding variables that also might explain our results we examined age, race, income, occupation, prepregnancy weight, provider, readmission of the infant, maternal readmission, and infant feeding method for differences between the exercise and nonexercise groups. No significant differences were found. We did not have variables that specifically asked about number of children at home and extent of help available at home; we used parity and marital status as proxies for these variables and again found no significant differences.

As a secondary analysis, the current study was limited by the variables as defined in the parent study. No specific definition of vigorous exercise was provided, nor was level of activity specified any further than more, less, or the same as usual. Physiologic measures and greater specificity of exercise items on the questionnaire would have provided a stronger level of measurement and should be incorporated in future investigations. On the other hand, the bulk of evidence about the health and well-being benefits of physical activity in the epidemiologic literature is based upon self-reported data. We sug-

**P**ractice of vigorous exercise did not affect lactation success at 6 weeks postpartum.

gest that our results have a similar value. More precise definitions of physical activity will be possible in subsequent prospective studies, but the results presented here raise pressing questions about a role for planned physical activity in postpartum care. This important area affecting women's health needs to be studied more widely; this secondary analysis is an appropriate beginning.

The findings of this study cannot address causality because the study participants were not randomly assigned to exercise groups. While it seems plausible to conclude that higher levels of exercise result in more postpartum weight loss and better psychosocial health, it is also possible that women who weigh less and have better psychosocial well-being are more inclined to exercise. A randomized controlled trial is the only research design that will address these questions of causality.

Having said that, it is noted that the relationships between exercise and psychosocial health reported here are remarkably robust across such indices as participation in fun activities and postpartum adaptation. It is well known that exercise has a beneficial effect upon depressive symptoms of women in general (North et al., 1990). It is further recognized that the postpartum period is a time when women are at increased risk of depression (Beck, 1993; Campbell & Cohen, 1991). This study is the first to posit benefits from physical activity for the psychosocial well-being of postpartum women.

**I**n this analysis, the association between exercise and indicators of well-being is consistent with research conducted with nonchildbearing women and merits further investigation with postpartum women.

Because the larger perinatal study focused on women who were in good health with no complications of pregnancy, there were no items on the postpartum survey that directly assessed postpartum mood disorders. However, the Lederman measures of postpartum adaptation represent important components of psychosocial well-being such as satisfaction with life circumstances, satisfaction with motherhood, confidence in tasks of motherhood, and satisfaction with partner relationship. The consistent postpartum adaptation advantage demonstrated by the women who exercised and were more active suggests an important association between exercise and postpartum psychosocial well-being.

Further support was provided by the greater num-

bers of fun leisure activities listed by vigorous exercisers. Because this was a relatively healthy and affluent sample, the differences were less likely to be great. Thus, it is noteworthy that statistically significant differences were found in six of the seven postpartum adaptation subscales and in the number of fun leisure activities. A population with greater numbers of women with poor general health, absent partners, and low socio-economic status might be expected to demonstrate even more pronounced differences with greater marginal benefit of exercise. Future research could add to the understanding of the effects of postpartum exercise by assessing longitudinally for depression, anxiety, and other mental health disorders and examining the effects of participation in vigorous physical activity, using a broader range of indices of well-being.

The relationship of gratification with labor and delivery to vigorous exercise was particularly intriguing. Because the labor and delivery experience preceded the time of the postpartum measures, it was tempting to posit that greater gratification fueled increased postpartum activity. But an alternative hypothesis must also be acknowledged: It may be that the personality characteristics of women that foster physical activity also affect their ability to have a positive birth experience. Importantly, gratification from the birth experience was the only additional subscale of the Lederman measures that emerged as significant when the sample was stratified into the most active and least active groups. If the explanation were simply personality characteristics, it is likely that the subscale support from friend/family would also be related. This was not the case. We speculate that women's self-esteem and self-efficacy were enhanced by a positive birth experience and thus energized them postpartum, but our data did not include the prepregnancy measures necessary for us to test for this type of interaction. Future studies should investigate an independent effect of gratification with birth experience by controlling for general levels of self-esteem or self-efficacy with pre- and postpartum measures.

The relationship between greater activity level at 6 weeks postpartum and weight retention was less surprising. Our results of less retained weight in more active women are convergent with the findings of others as reviewed by Parker (1994) and with the findings of Ohlin and Rossner (1994). The consistency of our findings with those of others (Dewey et al., 1994) with regard to no deleterious effect of exercise on lactation provides further encouragement for women who are breastfeeding and who wish to maintain or begin a personal fitness program.

Although a randomized controlled trial is needed to provide definitive knowledge about causal effects, the results reported here provide the basis for nurses to work with women to assess their previous activity levels and to

help them plan for ways to maintain or begin personal fitness programs. Postpartum women should be informed about the more than half of women whose level of activity declines postpartum and about the potential benefits of vigorous exercise. The general guide provided by ACOG's technical bulletin (1994) is that exercise can be gradually resumed according to women's physical capabilities.

Lest the clinician think that this is just one more item to load into an already packed postpartum discharge plan, an example from this study may provide encouragement. From Table 1 it can be noted that an unusually high proportion of women (71.4%) reported doing stretching activities. One of the providers in the health care system where this research was conducted had a special interest in the value of stretching exercises. During the time of data collection all women received a booklet in their discharge teaching materials about stretching exercises for postpartum recovery. This specific suggestion seemed to be well-used, because the impact on women's self-care practice is seen in the more than two thirds who followed the recommendations. The extent to which this one suggestion was incorporated may reflect women's desire for specific information about physical activity after childbirth. We argue that ensuring that women have sufficient information about the role of vigorous exercise would similarly affect their incorporating exercise into their self-care and, ultimately, improve their postpartum well-being.

As when conducting other interventions, the nurse needs to assess individual goals and cultural beliefs. In this sample the few women in the Asian (6%) and black (3%) groups did not differ statistically in their patterns of activity from white women. However, a more heterogeneous sample or one from a different region might have shown ethnic differences in postpartum activity. In Bild et al.'s epidemiologic study (1993) black women had lower physical activity scores than did white women at all ages. Of note was the finding that the least differences between blacks and whites were among the most accessible activities. Thus, the lack of access to fitness facilities, equipment, and organized groups may be a barrier to physical activity in black women. Also, some cultural groups or individuals may value rest over fitness as the means to postpartum recovery or they may consider exercise to be a physical stressor (Airhihenbuwa, Kumanyika, Agurs, & Lowe, 1995). An emphasis on rest may be especially true among women who observe traditions where childbirth "confinement" extends through several weeks postpartum. Further research about ethnic differences is needed to address these issues.

In conclusion, these exploratory results indicate that physical and psychologic benefits may accrue to those postpartum women who are able to exercise vigorously and avoid decreasing their usual level of activity.

A prospective randomized test of this relationship is warranted. While positive outcomes of physical activity have been demonstrated in the population at large, exercise has rarely been an element in postpartum care plans. Nurses who care for women after childbirth should assess women's exercise goals and support them in their desired activities.

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*Carolyn M. Sampselle is a professor of nursing, with joint appointments in medicine and women's studies, at the University of Michigan, Ann Arbor.*

*Julia Seng is a doctoral candidate at the University of Michigan School of Nursing, Ann Arbor.*

*SeonAe Yeo is an associate professor of nursing at the University of Michigan School of Nursing, Ann Arbor.*

*Cheryl Killion is an assistant professor of nursing at the University of Michigan School of Nursing, Ann Arbor.*

*Deborah Oakley is a professor at the University of Michigan School of Nursing, Ann Arbor.*

*Address for correspondence: Carolyn M. Sampselle, RNC, PhD, University of Michigan School of Nursing, 400 North Ingalls, Ann Arbor, MI 48109-0482.*