

Exercise and Pregnancy

by Valerie Lee

Introduction

More and more women now make regular, vigorous exercise a part of their daily lives and wish to continue to do so during pregnancy and while breastfeeding. Many questions have been raised about the effects of maternal exercise on the health of the mother and the developing fetus.

In the last few years there has been a growing interest in researching the topic of exercise and pregnancy. When Melpomene first compiled a bibliography on this topic in 1983, 40 items were listed. In 1985 a second bibliography included more than 50 new citations. Melpomene's latest bibliography, completed in September 1988, has more than 100 new books and articles. (A selected list of citations accompanies this report. Copies of all three bibliographies on exercise and pregnancy are available in Melpomene's Exercise and Pregnancy information packet.)

However, if we ask what we know about exercise and pregnancy, we must answer: quite a lot, but not enough. We still do not have a good answer for the woman who asks, "Will I hurt myself or my baby if I exercise while I'm pregnant?"

Exercise and pregnancy was one of the first topics Melpomene chose to research. Our first study was done in 1981. It was largely a retrospective study and consisted of a lengthy survey completed by 195 women who ran during their pregnancies.

The sample involved was national. The average age of the participants was 29. Their average running mileage was 25 miles per week in the three months prior to conception. Overall, we found things to be normal; i.e., normal pregnancies, normal labors and deliveries and normal, healthy babies. This first study served as a pilot for our second, prospective study on exercise and pregnancy which we began in the fall of 1983.

It is important to remember that women all over the world have always engaged in strenuous physical activity during pregnancy and in the immediate post-partum period. However, it is a relatively new phenomenon to talk about voluntary, recreational exercise during pregnancy, exercise that is undertaken in the name of health. Indeed, the widespread participation of women in sports is new.

While there has been a history of research on pregnancy and work, until recently there had been less research on women and 'play.' Because of this, health care providers often have been unable to advise pregnant women on exercise.

In a 1983 study we asked women whom they were seeing for obstetrical care and whether that person was supportive of exercise during pregnancy. We also wanted to know if these health care providers were knowledgeable about exercise and pregnancy.

More than 70% of the women in the study were seeing an obstetrician/gynecologist. Ten percent were seeing another type of physician, and 15% were in the care of a nurse midwife. Of these providers, 80% were judged supportive but only 60% were described as knowledgeable. While it is good to be supportive, there is also a need for information. Our research on exercise and pregnancy was designed to provide some of this needed information.

Method

Procedure

In 1983 we began a nationwide recruitment of women early in their pregnancies. We were looking specifically for women who regularly ran or swam, and who intended to continue their activity during pregnancy. As they were enrolled in the study, each of these physically active women was asked to identify a pregnant woman who was not physically active to serve as a comparison. We also sought sedentary women through local physicians and other personal contacts.

Each woman completed a series of questionnaires. The first asked about their exercise and medical histories. Each trimester, participants supplied information on the progress of their pregnancies and exercise experiences. They also completed a form following labor and delivery. At two and six months, post-partum data was collected on each woman's health and exercise patterns, as well as on her child's health and development.

Subjects

Data analysis was completed from a total of 151 women. There were 97 runners, 27 swimmers and 27 sedentary women. Data from three women (two runners and one sedentary) who had twins were not included in this analysis. After eliminating subjects with negative outcomes, the final sample consisted of 124 women: 77 runners, 26 swimmers and 21 sedentary women.

Results and Discussion

Negative outcomes were reported in an earlier *Melpomene Report* (Fall 1986).

History: Information on parity, age, height, weight and education of subjects was presented in the Winter 1988 *Melpomene Journal*.

Exercise patterns. The average number of years running prior to pregnancy was seven. The average number of years swimming was nine. In the three months prior to conception runners averaged 27.9 miles per week. Swimmers averaged two miles per week. The average number of days running was five per week, and the average number of days swimming was three per week. These figures indicate that the women in the study were regular in commitment, and that the sample is representative of the average rather than the elite athlete.

Labor/Delivery. Please see the Winter 1988 *Melpomene Journal* for information about labor and delivery, including type of delivery and length of labors.

Exercise, Pregnancy and Pregnancy Outcome. Infant birth weight has been the focus of much recent research on exercise and pregnancy. It can be used as an indicator of the effect of exercise on pregnancy outcome.

The question has been asked, Is maternal exercise associated with lowered infant birth weight? In our previous exercise and pregnancy research the only correlate of infant birth weight was maternal weight gain. However, other researchers have found a relationship between

aerobic exercise in the third trimester, maternal weight gain, gestational length and birthweight. Continued aerobic exercise in the third trimester has been linked with shorter gestational length, lower maternal weight gain and decreased birth weight, but neither maternal nor infant health were negatively effected.

Overall, in our study we found:

1. There were significant differences between groups for maternal weight gain. This difference was accounted for by differences in weight gains between runners and sedentary women. No significant differences were found for gestational lengths. See Figure 1.

<u>Groups</u>	<u>Weight Gain</u>	<u>Birth Wt.</u>	<u>Gest. Length</u>
Runners	25# 13 oz.	7# 9 oz.	39.97 weeks
Swimmers	27# 15 oz.	7# 2 oz.	39.92 weeks
Sedentary	31# 8 oz.	7# 14 oz.	40.14 weeks

Figure 1

2. There were significant differences between groups for infant birth weight. This difference was accounted for by the lower birth weight of babies of swimmers in comparison to either runners or sedentary women. Although babies of swimmers were lighter, all the infants were within the normal range for birth weight. There also was no increase in complications for babies born of swimmers.

3. All but two swimmers continued to exercise throughout their pregnancies. If the lower birth weights of their infants were due to this continued exercise, differences in birth weights for babies of runners might be found if exercise levels were considered. Forty-one of the 77 runners continued to run during the third trimester. The average per week mileage for each month was 16.3 miles in the seventh and eighth months, and 11.2 miles in the ninth month.

No significant differences were found between infant birth weights of women who stopped running before the third trimester, women who continued running and sedentary women, even though women who continued to run gained significantly less weight than either of the other two groups. See Figure 2.

	Run >28 wks (n=41)	Run <28 wks (n=36)	Sedentary (n=21)
Weight gain:	23# 14 oz.	28# 12 oz.	31# 8 oz.
Birth weight:	7# 10 oz.	7# 11 oz.	7# 14 oz.
Gest. (weeks)	39.68	40.4	41.14

Figure 2

4. To further explore the effect of exercise level on pregnancy outcome, the 41 runners who ran in the third trimester were categorized as either high or low mileage runners based on average weekly miles summed over the trimester. On this basis 25 runners were classified as low, and 16 runners were classified

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as high mileage.

Figure 3 shows the weight gains, birth weights and gestational lengths of high mileage runners, low mileage runners and sedentary women. Only weight gains are significantly different. Sedentary women gained more than either groups of runners.

	High Miles (n=16)	Low Miles (n=25)	Sedentary (n=21)
Weight gain:	21# 6 oz.	25# 6 oz.	31# 8 oz.
Birthweight:	7# 13 oz.	7# 11 oz.	7# 14 oz.
Gest. (weeks):	39.75	39.9	41.4

Figure 3

Conclusion

Although some women who exercise may have smaller infants, in general no physically harmful effects of exercise during pregnancy have been identified. On the other hand, no physical benefits have been found consistently either.

Psychological benefits often are cited by women who choose to exercise while pregnant. At a time of physical and psychological stress, psychological benefits are not to be discounted. Many aspects of exercise and childbearing remain to be explored and should be the focus of new research. These areas of research include:

1. Large-scale epidemiological studies are in order given the ethical limitations to the kinds of experimental research that can be done with human subjects.
2. Longitudinal research of both mothers and infants would help identify long-term effects of exercise.
3. Nutrition for the exercising pregnant woman has received little attention. Melpomene's research found the pregnant and breastfeeding runners had low caloric consumption and insufficient iron and calcium intake.
4. The post-partum period has been ignored by researchers. What is the role of exercise in physical and psychological recovery?
5. More needs to be known about the relationship, if any, between fertility and exercise.
6. Orthopedic and physical therapy questions need answers. What are the implications of connective tissue and postural changes for exercising during and after pregnancy?
7. What are the effects of exercise on special populations of pregnant women, such as teenagers, diabetics and the differently abled?

Although we do not know all we would like to know about exercise and pregnancy, at this time it does not appear the the pregnancies, or pregnancy outcomes, of exercising women differ significantly from those of nonexercising women. Our hope is that pregnant women will be able to obtain the information and support they need to make healthy choices about their lifestyles. ○

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