

Effects and experiences of exercise during pregnancy

Akademisk avhandling

för avläggande av medicine doktorsexamen vid Sahlgrenska Akademin vid Göteborgs universitet.

Avhandlingen kommer att offentligens försvaras i Hörsal Arvid Carlsson, Academicum,

Medicinaregatan 3, Göteborg.

Fredagen den 23 oktober 2015 kl. 09.00

av

Karolina Petrov Fieril

Leg Sjukgymnast, MSc

Fakultetsopponent:

Professor Lena Nilsson-Wikmar

Institutionen för Neurobiologi, vårdvetenskap och samhälle, Karolinska Institutet, Huddinge

Avhandlingen baseras på följande delarbeten.

- I. Petrov Fieril Karolina, Larsson Maria EH, Glantz Anna, Fagevik Olsén Monika. *Experiences of exercise during pregnancy among women who perform regular resistance training: A qualitative study*. Phys Ther. 2014 Aug; 94(8):1135–43.
- II. Petrov Fieril Karolina, Glantz Anna, Fagevik Olsén Monika. *The efficacy of moderate-to-vigorous resistance exercise during pregnancy: a randomized controlled trial*. Acta Obstet Gynecol Scand. 2015 Jan; 94(1):35–42.
- III. Petrov Fieril Karolina, Glantz Anna, Fagevik Olsén Monika. *Exercise in pregnancy: Hemodynamic responses to single sessions of aerobic exercise and resistance exercise*. In manuscript.
- IV. Petrov Fieril Karolina, Fagevik Olsén Monika, Glantz Anna, Premberg Åsa. *Experiences of a lifestyle intervention in obese pregnant women – A qualitative study*. In manuscript.



UNIVERSITY OF GOTHENBURG

Effects and experiences of exercise during pregnancy

Karolina Petrov Fieril

Institute of Neuroscience and Physiology, Department of Health and Rehabilitation, Sahlgrenska Academy at University of Gothenburg, Gothenburg, Sweden 2015

ABSTRACT

Background: Recommendations regarding intensity, duration and type of exercise during pregnancy vary worldwide. Most research on exercise during pregnancy investigates the effects of aerobic exercise while only a few trials have studied the effects of resistance exercise. Obesity is a growing public health problem and little is known about obese pregnant women's experiences of participating in a lifestyle intervention focusing on diet and physical activity. This thesis aims to: 1) to describe experiences of exercise during pregnancy among women engaged in regular resistance training; 2) evaluate the health effects, in healthy pregnant women engaged in moderate to vigorous-intensity resistance exercise with free weights; 3) investigate and compare blood pressure (BP), heart rate (HR), body temperature and ratings of perceived exertion (RPE) during and after two single sessions of light to moderate continuous exercise, Nordic walking and resistance exercise, in healthy women in the second trimester of pregnancy; and 4) describe the experiences of women with obesity related to participating in a lifestyle intervention, and its experienced impact on health and lifestyle. **Methods:** A combination of quantitative and qualitative methods was used to elucidate different aspects of interest. Study I was assumed to complement studies II (a randomized controlled trial) and III (a cross over design) by adding a wider variety of viewpoints and experiences of resistance exercise as qualitative studies can. Study IV was considered to complement a range of quantitative studies evaluating the effects of lifestyles interventions in pregnancy.

Results: Exercise was perceived to have a positive impact on body and mind and was thus described as generating both immediate and short-term health benefits. The women experienced that exercise led to a sense of control in pregnancy; problems related to pregnancy such as weight gain, poor posture, nausea, fatigue, headache, insomnia and back pain were perceived to be resolved and/or addressed. Performing resistance exercises generated an experience that their body was capable of many types of exercises, and they also found it valuable for acquiring good posture. The women considered that resistance training was a suitable type of exercise during pregnancy (Study I). The women's functional status deteriorated during the intervention in both the intervention and control groups and pain increased. There were only significant differences between the groups for birthweight. Newborns delivered by women who underwent resistant exercise during pregnancy were significantly heavier than those born to control women; 3561 (\pm 452) g versus 3251 (\pm 437) g ($p=0.02$), a difference that disappeared when adjustment was made for gestational age ($p=0.059$). Both groups showed normal health related quality of life, blood pressure and perinatal data (Study II). During exercise, there was a significant increase in systolic BP and HR ($p<.001$). Diastolic BP increased, slightly more during aerobic exercise ($p=.01$) than resistance exercise ($p=.03$). Resistance exercise was perceived as more intense than aerobic exercise during 15 minutes ($p=.02$) and 30 minutes ($p=.001$) of exercise. After both types of exercise, BP quickly reverted to normal, although HR was still increased five minutes post-exercise ($p=.001$). There was a moderate but non-significant correlation between HR and RPE during 15 minutes of aerobic exercise, ($r_s=.43$; $p=.06$), but the other correlations were weak ($r_s<0.2$) and non-significant. Orally measured temperature decreased during aerobic exercise ($p=.008$) (Study III). The essence of the women's experiences of participating in a lifestyle intervention during pregnancy was their expressed need for support to implement new habits, provided by midwives, partners, relatives and friends – as well as by obese pregnant women in the same situation. The midwives' support was experienced as non-judgmental with a balanced outlook on weight. The essential structure of participation can be described with the following constituents: "pregnancy encourages change"; "non-judgmental support"; "from bad habits to conscious choices" and; "barriers to change" (Study IV). **Conclusion:** Among healthy women who exercise regularly, from walks to moderate-to-strenuous exercise, regular moderate intensity resistance exercise appears to be appropriate during the second trimester of pregnancy. Pregnant women who perform this type of exercise considered it as suitable. Aerobic and resistance exercise corresponding to 13–14 on the Borg RPE-scale seems to be safe with regard to blood pressure and heart rate responses in second trimester healthy pregnancies. In order to implement new habits, participants of a lifestyle intervention express a need for support, given with a non-judgmental attitude and a balanced outlook on weight. For controlling gestational weight gain, lifestyle interventions focusing on healthy eating patterns are probably of major importance.

Keywords: pregnancy, resistance exercise, aerobic exercise, physical activity, obesity, blood pressure, heart rate, qualitative content analysis, phenomenology, women's health

ISBN: 978-91-628- 9551-8 (hard copy)

978-91-628-9552-5 (e-publication)

<http://hdl.handle.net/2077/39527>