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Evaluation of implementing a community-based exercise intervention during pregnancy

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ABSTRACT

Objective: to evaluate the implementation of a community-based exercise intervention (the Norwegian Fit for Delivery study) during pregnancy.
Design: descriptive, explorative.
Setting: healthcare clinics in southern Norway, including urban and rural settings.
Participants: healthy, nulliparous women with singleton pregnancy of ≤20 gestational weeks, age ≥18 years and body mass index ≥19 kg/m^2.
Methods: women were randomised to either twice-weekly supervised exercise sessions combined with nutritional counselling (n=303) or standard prenatal care (n=303). The exercise program was based on ACOG guidelines, with the same low-impact workout for all participants, including 60 minutes of moderate-intensity cardiovascular and strength training, performed in a group of maximum 25 women. The aim of the present secondary analysis was to report on the intervention group's experience with participating in an exercise program in the 2nd and 3rd trimester, including satisfaction, adherence, adverse effects, as well as motives and barriers for attending the classes.
Findings: of 303 women randomised to exercise, 274 (92.6%) attended at least one class and 187 (68.2%) completed a questionnaire after completion of the trial assessing their experience with the group sessions. For 71.7%, self-reported exercise dosage was ≥75% of the twice-weekly exercise program and more than seven out of 10 reported to be satisfied or very satisfied with the exercise sessions. A total of 95.1% answered that they would recommend this type of exercise for pregnant friends. Reported motives and health benefits included better aerobic capacity, increased energy levels and exercise enjoyment. No harmful effects of the exercise intervention were noted in the mother or the fetus.
Key conclusions and implications for practice: results demonstrated that regular group exercise was feasible, safe, and well tolerated in pregnancy, which may encourage incorporating this program into a routine health care setting.

Introduction

For healthy women with normal pregnancies, the American College of Obstetricians and Gynaecologists (ACOG 2015) guidelines promote continuation of pre-pregnancy exercise activities, and recommend that sedentary women start exercising during pregnancy. Hence, in the absence of medical or obstetrical contraindications, all pregnant women are encouraged to be physically active for at least 20–30 minutes per day, equivalent to a minimum of 150 minutes per week of moderate-intensity aerobic activity (ACOG 2015).

Regular physical activity has favourable physiological and psychological health benefits for both the mother and the fetus. Benefits

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include gestational weight gain control, enhanced cardiorespiratory fitness, attenuation of complaints including low back pain, pelvic girdle pain and urinary incontinence, prevention of gestational diabetes, hypertension and preeclampsia, improved feeling of wellbeing, self-image and mood stability, as well as shorter labor in women who start labor spontaneously and decreased incidence of operative delivery (Melzer et al., 2010; Kasawara et al., 2012; ACOG, 2015, Artal, 2015; Muktabhant et al., 2015; Haakstad et al., 2016).

On the other hand, studies have generally shown that few women meet recommended levels of physical activity, and that there is a decline in exercise frequency from pre-pregnancy levels and throughout the course of pregnancy (Evenson et al., 2004; Haakstad et al., 2007; Owe et at., 2009; Nascimento et al., 2015). Therefore, more research and interventions aimed at maintaining or increasing pregnant women's physical activity level are warranted, including studies on adherence strategies. To date, very little documentation exists in this field and only a small number of feasibility studies have been carried out in a non-English-speaking population (Hemminki and Blondel, 2001; Kinnunen et al., 2008).

Pregnancy is considered an ideal time for behavior modification (ACOG, 2015). Nearly 100% of women in western countries receive prenatal care 5–8 times throughout pregnancy (Villar et al., 2001), and studies have shown that pregnant women may be more receptive to health messages (Lumley et al., 2009; Wilkinson and McIntyre, 2012). Hence, general practitioners and midwives in the healthcare system may be in a unique position to encourage pregnant women to enroll in a structured exercise program, which may also help to promote long-term physical activity habits. In Norway, routine antenatal health care is free of charge and utilised by nearly all pregnant women (Sagedal et al., 2013). Therefore, initiating a more systematic approach to enhance motivation for regular exercise participation during the antenatal period, for example through regular supervised group exercise sessions, may be advantageous. The aim of the present study was to report on women's perspectives on such an intervention (the Norwegian Fit for Delivery study), and examine the intervention group's experience with participating in a twice-weekly exercise program, including satisfaction, adherence, adverse effects, as well as motives and barriers for attending the classes.

Methods

Design and setting

This study was part of the Norwegian Fit for Delivery randomised controlled trial. Pregnant women given access to supervised exercise sessions and nutritional counselling (intervention group) were compared with those receiving standard prenatal care (control group), analyzing several endpoints, including newborn birth weight, gestational weight gain, maternal glucose levels, and postpartum weight retention (Sagedal et al., 2013). The trial was conducted in the prenatal health care system of southern Norway, comprising both urban and rural settings. The present paper reports on the intervention group's experience with participating in twice-weekly supervised exercise sessions throughout pregnancy.

The Regional Committee for Medical Research Ethics, South-East C, Norway (reference number 2009/429) approved the study, and written informed consents were obtained by all participants. The study was conducted in agreement with the CONSORT statement (Altman et al., 2001) and prospectively registered in the ClinicalTrials.gov (ID NCT01001689).

Participants and randomization

The Norwegian Fit for Delivery is among the largest published trials of a prenatal lifestyle intervention to limit gestational weight gain. The size of the trial was primarily based on power calculations for the assessment of prevalence of newborns with a birthweight.

> 4000 g, hypothesizing a reduction from 20% to 10%. Sample size calculations showed that we needed at least 198 women in each intervention arm. Due to risk for participant dropout and preterm childbirth, a total of 606 healthy nulliparous pregnant women were enrolled by midwives at eight health care clinics between September 2009 and February 2013. Inclusion criteria were ability to read, understand and speak Norwegian or English, singleton pregnancy within the first 20 weeks of gestation, age ≥18 years and a pre-pregnancy body mass index ≥19 kg/m^2. Exclusion criteria were pre-existing diabetes, physical disabilities that would preclude participation in the exercise program, ongoing substance abuse, as well as planned relocation outside the study area before childbirth.

A research nurse, not involved in recruiting participants or carrying out the intervention, assigned participants consecutively to lifestyle intervention (n=303) or control group (n=303) using a computer-generated list with 1:1 allocation ratio in blocks of 20. The protocol and a complete flow chart of the participants throughout the main study have already been published (Sagedal et al., 2013, 2016a, 2016b). The principal analysis of the present study was based on participants randomised to the intervention group who, after the intervention period, completed the standardised study questionnaire that assessed their experience with group training (187 out of 274) (Fig. 1).

There was no financial compensation to the participants, but all examinations and exercise sessions were free of charge. In addition, two extra prenatal care visits, including ultrasound measurements, were provided in the third trimester.

Exercise intervention

The exercise program was designed to follow national and international guidelines at that time (ACOG, 2002), and consisted of supervised group sessions. Each session lasted 60 minutes, was performed twice weekly and was accessible from time of randomization (gestation week 17.7 ± 2.6) until childbirth. The Fitness instructors were qualified to deliver antenatal sessions (either physiotherapists or graduate students in sports science) and registered attendance. The groups met at one of five different fitness centers, and all participants were offered the same exercise program, including 10 minutes of warm-up, 40 minutes of strength training and cardiovascular exercise (moderate intensity, ratings of 12–14 on the 6–20 Borg's rating scale (Borg, 1970), and 10 minutes of stretching. Each session included exercises for the pelvic muscle floor muscles.

Although practical and economic considerations limited classes to two per week, all women in the intervention group were encouraged to be physically active at moderate intensity on three additional days per week, lasting at least 30 minutes. This was in accordance with recommendations for physical activity during pregnancy (ACOG, 2002). Information about maternal exercise and physical activity was provided on a Fit for Delivery web site and in the Fit for Delivery brochure.

Participants in the control group received routine prenatal care in accordance with Norwegian standards and were neither encouraged nor discouraged from exercising.

Outcome measure

All participants in the study were examined at the time of inclusion (baseline), at 30 and 36 weeks of gestation, at the time of childbirth and at 6 and 12 months postpartum. For the purpose of the present study we used some information covered in the baseline questionnaire (demographic information such as age, pregnancy week, smoking habits, education, and occupation). Pre- pregnancy status including participant's weight, smoking habits, physical activity level and key nutritional behaviours was reported retrospectively at inclusion. Assessments of physical activity level and sedentary behaviour were