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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 randomized 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.

Results: Of 303 women randomized 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.

Key words: Adherence, exercise, feasibility, pregnancy, RCT

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 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 (ACOG, 2015, Artal, 2015; Haakstad et al., 2016; Kasawara et al., 2012; Melzer et al., 2010; Muktabhant et al., 2015).

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 utilized 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 randomized 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 delivery, 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 delivery.

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, Sagedal et al., 2016). The principal analysis of the present study was based on participants randomized to the intervention group who, after the intervention period, completed the standardized study questionnaire that assessed their experience with group training (187 out of 274) (Figure 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 delivery. 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 delivery 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 completed using the short version of the International Physical Activity Questionnaire (IPAQ-SF) (Craig et al., 2003) at gestational week 16 and 36.

Assessment of the participants' experience with the exercise intervention was conducted after completion of the trial, and included 25 questions specifically designed to address factors associated with adherence and drop-out, as well as to identify motives and barriers for participating or non-participating in the exercise intervention. We tried to avoid leading questions, limit open-ended questions, and use simple rating scales and a fixed list of answer options (Choi and Pak, 2005). A structured questionnaire may be easier to code and analyze, as well as easier for the respondents to complete. However, questionnaires does not give room for any answers outside the alternatives given. Hence, the collected data are limited to the choices you provide. Therefore, emphasis was placed on including a relevant list of choices with respect to the response options. A pilot testing of the questionnaire was completed among six research group members. This allowed us to identify and correct potential problems with the format or wording. In addition, we removed inaccuracies or vagueness, and edited the questions and the response options. Below is a list of the 13 questions and corresponding response options used in the present study.

1. *Were you satisfied with the training program?*

   The participants rated their satisfaction on a scale from 1-10, where 1 represented "very dissatisfied" and 10 represented "very satisfied"

2. *What do you think is the optimal size of participants in a training group?*

   Response options: "1-10", "11-20", "21-30", or "more than 30"

3. *How did you experience exercising in a group setting compared to exercising individually?*

   a. *More motivating in a supervised group setting*

      Response options: "Yes", "no", or "the same"

   b. *Training in a group involves more commitment and I attend more often*

      Response options: "Yes", "no", or "the same"

4. *How often did you participate in the group training sessions?*

   Response options: "all (100%)", "75-99%", "51-74%", "50%", "25-49%", "1-24%" or "none"

5. *If you did not attend the training sessions regularly, could something been done differently so that you would have participated more often?*

   Response options: "SMS reminder", "other instructor", "classes scheduled at alternative times", "a new training group", "alternative mode of training (please specify)", "other reasons (please specify)" and "no". Selection of maximum two responses was allowed.

6. *Did you experience any adverse effects due to the group training sessions?*

   Response options: "contractions of the uterus", "vaginal bleeding", "muscle soreness", "pelvic girdle pain", "rupture of membranes", "urinary incontinence", "premature birth" or "other injuries or complaints (please specify)". Selection of more than one response was allowed.

7. *Did you experience that the training groups had a positive effect on your physical fitness?*

   The participants rated their experiences on a scale from 1-10, where 1 represented "no positive effect" and 10 represented "very positive effect"

8. *Did you change your physical activity level over the course of your pregnancy?*

   Response options: "yes (more active)", "no (less active)" or "remained fairly unchanged"

9. *Did you experience any health benefits over the course of the exercise intervention?*

   Response options: "increased energy for daily life", "socializing with other group members", "improved self-confidence", "enhanced mood", "exercise enjoyment", "reduction in pregnancy complaints", "stress reduction", "less anxiety and depression", "weight gain control", "increased motivation to continue training", "improved sleep quality" and "none"

10. *Were you satisfied with the exercise instructor?*

    The participants rated their satisfaction on a scale from 1-10, where 1 represented "very dissatisfied" and 10 represented "very satisfied"

11. *Did participation in the intervention group motivate you to continue exercising after birth?*

    Response options: "very much", "to some extent", "not so much" or "not at all"

12. *Would you recommend this type of exercise classes for pregnant friends?*

    Response options: "yes", "no", or "I don't know"

13. *Would you attend a similar type of exercise classes in case of a new pregnancy?*

    Response options: "yes", "no", or "I don't know"

The present study also explored how the participants perceived the exercise intensity, for both resistance and endurance training. Higher scores represented greater average intensity of the exercise, with low levels ranging from 1 - 3.5 (no sweating and normal breathing), moderate levels from 3.6 - 6.5 (modest sweating and light breathing), and high levels from 6.6 - 10 (sweating and breathing heavily).

Participants answered the questionnaire electronically, with access from the Fit for Delivery web site, but a written version was also available in both Norwegian and English upon request. Not all participants answered every question and some had incomplete answers, resulting in varying response rates for some of the questions.

Statistical analyses

All statistical analyses were conducted with SPSS Software V. 21 for Windows. Background variables are presented as frequencies, percentages or means with standard deviations (SD). To address factors associated with adherence and drop-out, as well as to identify motives and barriers for participating or non-participating in the exercise portion of the intervention, we divided the women into two adherence groups: high (≥75% exercise program, n= 134) and low (< 75% exercise program, n=53) (Martin, 2001). Satisfaction with the exercise sessions was defined as score ≥ 7 on a 10-point scale. The relationship between high and low exercise adherence and selected variables, including health factors, were assessed by independent sample t-tests or Chi-square as appropriate. Significance was set to a p-value < 0.05.

Findings

Study population and characteristics

At trial inclusion, mean gestation week was 15.4 ±2.6, mean age was 27.9 ±4.2 years and mean pre-pregnancy BMI was 23.8 ±4.1 kg/m^2. Using pre-pregnancy BMI as criteria, 21.2% and 7.4% were categorized as overweight (BMI 25-29.9 kg/m^2) or obese (BMI ≥30kg/m^2) respectively, compared to 30% and 11% in the general population of Norwegian women (aged 20–85 years) (Hansen et al. 2013). The majority of participants were white and of Norwegian descent, reported cohabitation with a partner (96.6%), had middle to high household income (61.8%) and high educational status (67.5%), defined as university or college education. Eight women (2.7%) were daily smokers. There were no statistically significant differences in background or health variables, including self-reported physical activity level prior to the intervention, between the exercise and control group.

Among the intervention participants (n=303), 274 (92.6%) attended at least one exercise session at their local fitness center. Of these, 86 women declined to partake in the evaluation study, had incomplete questionnaires or did not return the questionnaire, giving a response rate of 68.2% (n=187) (Figure 1).

Self-reported adherence to the exercise classes was in mean 27.0 ±8.7 with a range from 1-38 sessions. Thirteen women (7.0%) reported that they attended all exercise classes, whereas 121 (64.7%), 34 (13.4%) and 19 (10.1%) attended 75-99%, 50-74% or < 50% of the sessions, respectively. Hence, for 71.7%, exercise dosage was ≥75% of the exercise program. When dividing the participants based on this level and comparing participants with high (≥75%) and low (<75%) exercise adherence, no statistical significant difference between the two groups were found on demographic or health factors such as age,

gestational week, smoking habits, BMI, physical activity level, weight gain, and education (Table 1).

Participant's experiences with attending the exercise program

A total of 75.4% reported to be satisfied with the exercise sessions, with a mean of 7.6 ±2.2 on a scale from 1-10, where 1 represented "very dissatisfied" and 10 represented "very satisfied". Women with high exercise adherence were significantly more satisfied (score of 8.2 ±1.8) than women exercising less frequently (6.3 ±2.5) ($p<0.001$). Mean satisfaction scores with the group-training instructors were 7.8±2.0 and 6.4±2.5 ($p<0.001$) in the high and low exercise adherence group, respectively.

Analyses of the participants' perceived exercise intensity, using a visual 10-point scale, showed a mean value of 5.0±1.8 for the aerobic exercise and 4.9±1.3 for the strength training exercise, representing moderate levels in accordance with the previous and current guidelines (ACOG, 2002; 2015). Women in the low adherence group reported the strength training exercises as more intense than women in the high adherence group (5.3±1.2 vs. 4.8±1.3, $p=0.034$). Irrespective of exercise adherence, 40% of the women found the sessions to be more demanding over the course of pregnancy.

The impact of group size in the exercise setting showed that sizes varying from 1-10 and 11-20 individuals per group were perceived as most optimal. Compared to exercising individually, 171 women (91.0%) reported exercising in a group setting to be more motivating. A total of 86.9% answered that they would attend a similar type of exercise class in case of a new pregnancy, and 95.1% would recommend this type of exercise for pregnant friends.

For 35.5% of the participants, there was a reported increase in total physical activity level over the course of pregnancy, beyond the group training sessions. Fifteen percent reported decreased physical activity level and for 50.0 % it remained unchanged.

Motivational factors, health benefits and exercise barriers

Table 2 shows the most common motivational factors and health benefits over the course of the exercise intervention. Exercise enjoyment was the most frequently cited response. Four out of 10 reported that participating in the intervention increased their energy level. Exercise as a factor to control gestational weight gain was reported by 24.9%.

With respect to better aerobic capacity/fitness, most participants answered that participating in training groups had a very positive effect, with a mean of 7.4 ±2.2 on a 10-point scale. Women with high exercise adherence had significantly higher fitness score compared to participants with lower exercise adherence (8.1 ±1.8 vs. 5.8 ±2.3, respectively, $p<0.001$).

A total of 59.3% answered that nothing could have been done to increase their participation in the group training sessions. The distribution of relevant factors that could have increased exercise is shown in Table 3.

In total, 16.4% and 14.4% reported muscle soreness and contractions of the uterus, whereas pelvic girdle pain were perceived by 9.7% and 20.8% in the high and low exercise adherence group ($p= 0.042$), respectively. One out of 187 respondents reported rupture of membranes, but did not give birth premature (Table 4).

Discussion

There is a need for studies that can increase our understanding of factors contributing to or limiting the effectiveness of exercise interventions. To our knowledge, no large-scale study has explored individual experiences with participating in an exercise intervention during pregnancy. The main findings in this descriptive, explorative study were that seven out of 10 responders reported an exercise dosage ≥75% of the program. Mean satisfaction score and exercise enjoyment were high, including rating of class group dynamics and choreography, as well as leadership performed by the group-training instructors. It is also notable that more than 85% of the participants increased or maintained total physical activity level throughout pregnancy, a period usually associated with a decrease in level of physical activity (Haakstad et al., 2007; Juhl etal., 2012). No harmful effects were seen, and the twice weekly exercise program was well tolerated, which may encourage transferring a structured exercise setting, such as the Norwegian Fit for Delivery study, into a routine health care setting.

Bias in questionnaires is an important issue in public health research as poorly designed questions can lead to deviation of results (Choi and Pak, 2005). Additionally, because of social desirability, over-reporting of "good behavior" or under-reporting of "bad" or undesirable behavior may occur (Adams et al., 2005). Bias may also arise from the way individual questions and responses were outlined and phrased, as well as how the survey was managed and conducted (Choi and Pak, 2005). The pregnant women targeted in this study may have had difficulty recalling experiences, since the study was conducted more than one year after completion of the trial. In addition, participants may differ in their understanding of exercise intensity and aerobic fitness, as well as their definition of

physical activity and different pregnancy complaints such as urinary incontinence and pelvic girdle pain (Choi and Pak, 2005).

There are physiological and anatomical adjustments during pregnancy, and exercise behaviour may be affected by common pregnancy complaints. Hence, it would have been advantageous if we had included more questions about specific complaints in the survey. Our results showed that more women in the low adherent group reported pelvic girdle pain. Otherwise, we found no differences between women with high and low exercise attendance and self-reported adverse effects due to the group training sessions (such as urinary incontinence, muscle soreness, vaginal bleeding, rupture of membranes, premature birth or other injuries).

According to the current exercise guidelines, pregnant woman are encouraged to exercise moderately 3-5 times a week (ACOG, 2015). Although practical and economic considerations limited classes to two per week, all participants were instructed to include at least 30 minutes of moderate physical activity, e.g. brisk walking, on 2-3 additional days of the week. This individual exercise was not recorded. However, at 36 weeks of gestation, there was a statistically significant difference between the intervention and control group in mean reported weekly energy expenditure (1560 vs. 1254 METs, p=0.009), compared to results at baseline (1515 vs. 1485 METs, p=0.828) (Sagedal et al., 2016). Hence, our data suggest that the exercise intervention created behaviour change, as the control group reported decreased physical activity level in late pregnancy. This corresponds with findings showing that the majority of women decrease or stop exercising by the third trimester (Haakstad et al., 2007; Juhl et al., 2012). From a public health perspective, improving the

new mother's lifestyle habits may also positively influence the lifestyle of the new family (Hesketh et al., 2014).

The Norwegian Fit for Delivery study was designed to be feasible in a clinical setting for a general population and to be easily reproducible. Implementation of the exercise intervention requires a health evaluation by qualified health personnel prior to participation in a prenatal fitness class, possibly assisted by an instrument for health screening (e.g. PARmed-X for PREGNANCY) (Davies etal., 2003), a gymnasium, as well as highly qualified exercise instructors following the current exercise guidelines (ACOG, 2015; Muth et al., 2015). The instructor's interest, enthusiasm and knowledge, as well as ability to give practical advice, were all factors emphasized in the design and development of the exercise protocol. According to Muth et al.(2015), a passionate and supportive instructor may influence the participant's perception of their relationship, which in turn can affect their exercise motivation. In the present study, the participants reported a mean satisfaction score of 8 on a 10-point scale, including both the class group dynamics and choreography, as well as leadership performed by the group-training instructors.

The results of this study also suggest that collaboration with a community antenatal program provides an infrastructure that facilitates recruitment and encourages the involvement of pregnant women in an exercise intervention. This is in accordance with a systematic review of 13 RCTs to increase adult physical activity through primary care and community collaborations, showing that the majority of interventions were cost-effective, especially those that included exercise groups or walking (Garrett et al., 2011).

Exercise enjoyment was the most frequently cited response when the participants rated different benefits over the course of the exercise intervention. Other reported health benefits were better aerobic capacity, improved energy in daily life, and enhanced mood and self-confidence. According to other studies, exercise enjoyment/pleasure may facilitate behavioural maintenance and adherence, further predicting future exercise intentions (Duncan et al., 2010; Schneider and Kwan, 2013).

Many pregnant women, especially first-time mothers, may be insecure; conflicting advice, myths and outdated exercise recommendations are a challenge (Clarke, 2004). Hence, safety issues are especially important when implementing interventions among pregnant women. It can be questioned whether the Norwegian Fit for Delivery study had the strength to detect adverse maternal or fetal exercise-related events. Still, an important finding of this trial was that no statistically significant differences were observed in selected adverse events or fetal outcomes between the exercise and the control groups (Sagedal et al., 2016a, 2016b). Further, no harmful effects were found when comparing women in the intervention group with high and low exercise attendance, including the babies' birth weight, gestational age or prematurity.

Strengths and limitations

A strength of the study is the pragmatic approach, particularly in including women attending antenatal health care clinics rather than examining a highly selected sample recruited through advertisement. Implementation of an exercise program following ACOG recommendations, conducted by certified personnel in a supervised setting, as well as a RCT design and a sample size among the largest published in a pregnant population, may also be considered major strengths.

Compared to mean response rate among mail surveys published in medical journals, which is approximately 53-60%, a participation rate of nearly 70% may be considered high (Asch et al., 1997). Unfortunately, we have no data with respect to the reasons for non-participating. However, exercise interventions are time-consuming and involve considerable cooperation from the participants. Hence, it is not unlikely that the women who responded to this particular questionnaire had more interest in and felt a stronger commitment to the exercise intervention than non-responders.

The questionnaire used for the present follow-up study covered a broad range of factors that could possibly explain adherence and drop-out, as well as motives and barriers for participating or non-participating in the exercise intervention. Another strength is that we also asked questions about exercise intensity, for both resistance and endurance training, since an exercise program that leads to an eventual goal of moderate-intensity exercise is recommended (ACOG, 2015).

Limitations are retrospective self-reporting and that the investigation was carried out in Norwegian and English only, and accordingly excluded women from other ethnic groups. Our participants were predominantly white, European, and highly educated, with relatively few being overweight or obese, and therefore not representative for all eligible women. On the other hand, this provided an opportunity to assess satisfaction and adherence, as well as factors optimizing motivation for attending a community based exercise intervention in a well-educated, middle class sample of white women.

Conclusion

We consider implementation of the Norwegian Fit for Delivery exercise program successful and that most women found participation in the intervention acceptable with a high satisfaction score. No harmful effects were reported and the exercise program was well tolerated. Hence, from a public health perspective, a structured exercise setting may be advantageous in reaching a high number of pregnant women.

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Figure 1 Consort diagram showing the flow of participants throughout the study

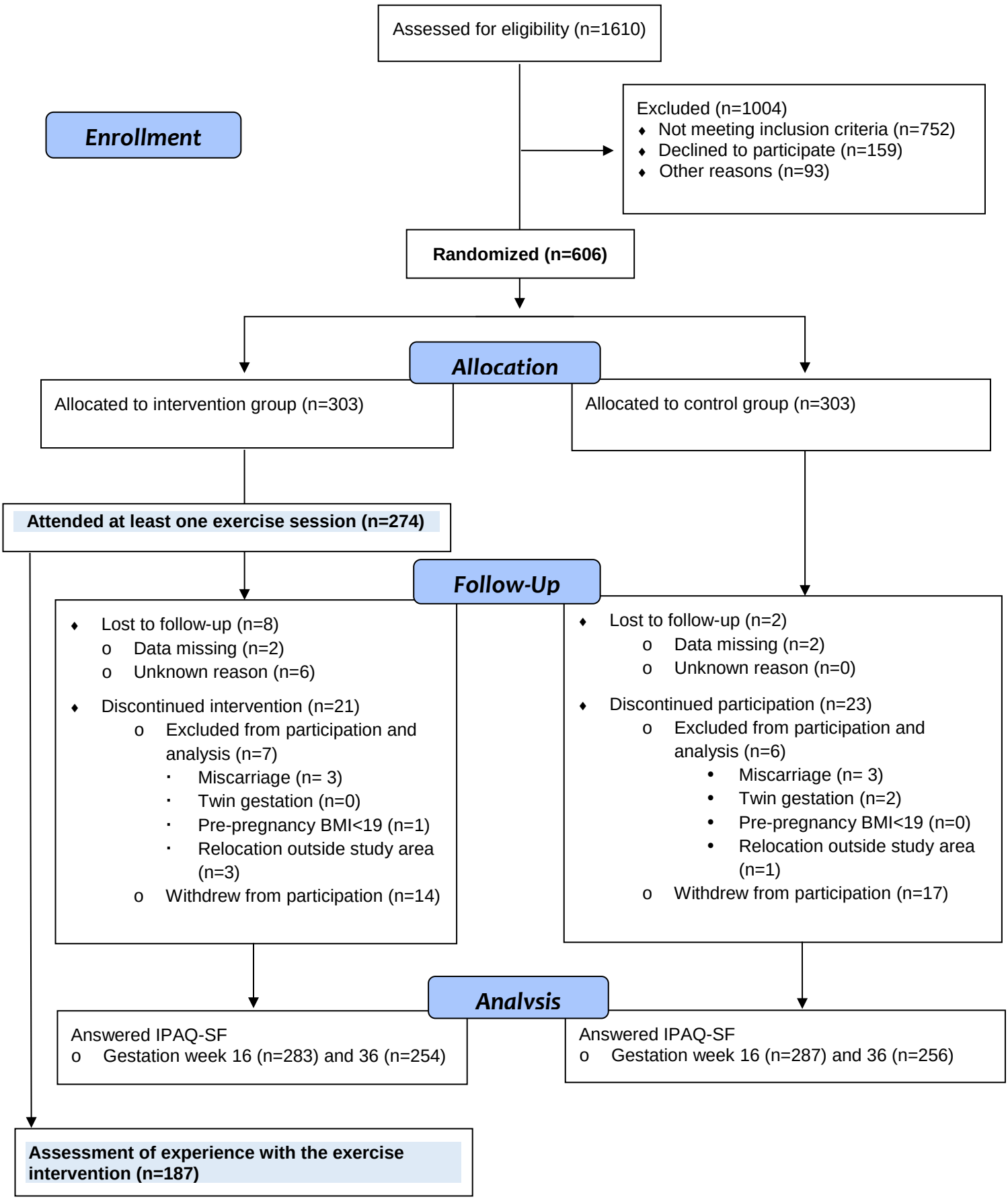

Table 1
Comparison of demographic and health factors between participants with high (≥75 of the program) and low (<75 of the program) exercise adherence. Data are presented as mean (SD) for continuous variables and n (%) for categorical variables.

	High adherence n=134 (71.7%)	Low adherence n=53 (28.3%)	Missing (n)	p-value
Age (years)	28.1 (3.7)	27.9 (4.5)	0	0.82
Pre-pregnancy BMI (kg/m^2)	23.3 (3.9)	23.8 (3.3)	3	0.42
Pre-pregnancy physical activity (min/weekly at moderate intensity)*	122 (151)	122 (169)	2	0.98
Gestational weight gain (kg)	14.1 (6.1)	15.6 (7.2)	23	0.20
Gestational age at delivery (week)	39.5 (2.1)	39.6 (1.7)	14	0.86
Babies birth weight (gram)	3397 (633)	3466 (503)	4	0.47
Daily smoker	2 (1.5)	1 (1.9)	1	
<4 years of higher education	80 (60.2)	36 (67.9)	1	0.32
Household income ≤400 000 (NKR /year)	44 (33.1)	19 (55.9)	2	0.72

**Self-reported using the short version of the International Physical Activity Questionnaire (IPAQ-SF)*

Table 2
Perceived motivational factors and health benefits over the course of the exercise intervention period (n=187). Data are presented in number (n) and percentage (%).

Factors	**n**	**%**
Exercise enjoyment	115	60.8
Increased energy for daily life	75	39.6
Increased motivation to continue training	67	35.4
Improved self-confidence	56	29.6
Enhanced mood	52	27.5
Socializing with other group members	48	25.4
Weight gain control	47	24.9
Reduction in pregnancy complaints	29	15.3
Stress reduction	11	5.8
Improved sleep quality	10	5.3
Less anxiety and depression	7	3.7
None of benefits	20	10.6

Note: The women were asked to respond the two most important categories

Table 3
The participants' (n=187) responses to the question: "*Could something been done differently so that you had participated more often?*" presented in number (n) and percentage (%).

Response options	**n**	**%**
No	112	59.6
Alternative training time	38	20.1
Another instructor	21	11.1
Different mode of training *(not further specified)*	20	10.6
SMS reminder	12	6.3
Other gym/exercise facilities	7	3.7

Note: The women were allowed to respond to maximum two categories

Table 4
Self-reported adverse effects with respect to the group training sessions (n=187). Data are presented in number (n) and percentage (%).

Response options	**n**	**%**
Muscle soreness	31	16.4
Contractions of the uterus	27	14.3
Pelvic girdle pain	24	12.7
Urinary incontinence	2	1.1
Rupture of membranes	1	0.5
Vaginal bleeding	0	0
Premature birth	0	0
Other injuries or complaints *(not further specified)*	3	1.6

Note: The women were allowed to respond to more than one category