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Original research

An investigation into the exercise behaviours of regionally based Australian pregnant women

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ABSTRACT

Objectives: Regular exercise during pregnancy is a recommended prenatal care strategy with short and long-term health benefits to mother and child. Unfortunately, most pregnant women are insufficiently active to obtain health benefits and there is evidence that activity levels decrease overall during pregnancy. Physical activity among regionally based women is lower than that of urban-based women within Australia. However, little is currently known about exercise behaviours of regionally based Australian pregnant women. To successfully promote exercise among regionally based pregnant women, a greater understanding of exercise behaviours must first be explored. This study investigated exercise behaviours in a sample of regionally based Australian pregnant women.
Design: Regionally based Australian pregnant women ($n = 142$) completed a modified version of the Godin Leisure-Time Exercise Questionnaire examining exercise behaviours before and during pregnancy.
Methods: Women self-reported their exercise behaviours, including exercise frequency, intensity, time and type, before and during pregnancy.
Results: Chi-square analysis revealed significantly less ($\chi^2 = 31.66$, $p < 0.05$) women participated in exercise during pregnancy (61%) compared to before pregnancy (87%). During pregnancy, respondents exercised at a significantly lower frequency ($\chi^2 = 111.63$, $p < 0.05$), intensity ($\chi^2 = 67.41$, $p < 0.05$), shorter time/duration ($\chi^2 = 114.33$, $p < 0.05$), and significantly less ($\chi^2 = 8.55$, $p < 0.05$) women (8%) are meeting 'exercise during pregnancy' guidelines compared to women before pregnancy (49%) meeting physical activity guidelines.
Conclusions: Exercise during pregnancy decreases to levels significantly lower than what is currently recommended. Public health initiatives that promote exercise among Australian pregnant women should aim to increase frequency, intensity, time and type of exercise to be undertaken during pregnancy.

1. Introduction

Historically, pregnancy was believed to be a time for rest. However, an increasing body of epidemiological and experimental evidence has recently challenged this view.[1–3] It is now widely acknowledged that appropriate exercise undertaken during pregnancy promotes many benefits for both the mother and her unborn child.[2–4] Current evidence suggests that these benefits begin to occur with an accumulation of at least 150 min of aerobic exercise per week at a moderate intensity.[5,6] For the pregnant mother these benefits include a lower risk for gestational diabetes and other pregnancy-related complications such as caesarean section and preeclampsia, improved cardiovascular function, enhanced muscular strength and lean muscle mass, a greater sense of well-being, and improved sleep.[2–4] Benefits to the unborn child include decreased resting foetal heart rate, improvement in the viability of the placenta, increased amniotic fluid levels, healthier birth weights, and increased gestational ages.[2,4] Despite this evidence and the subsequent release of 'exercise during pregnancy' guidelines by governing health bodies across the western world,[7] international and national data suggests that the majority of pregnant women (60–70%) are insufficiently active to obtain health benefits.[8,9]

To date, little is known about the specific exercise behaviours (exercise frequency, intensity time and type [FITT]) of Australian pregnant women. Previous research has separately examined these exercise behaviours and observed that Australian women are less active during pregnancy than before pregnancy,[10–12] and that exercise intensity and exercise duration also decrease over the course of the pregnancy.[11] However, no research to date has

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concurrently examined all four of the FITT exercise behaviours during pregnancy in the same cohort of Australian women. Furthermore, research focusing on healthy women residing outside of urban areas is currently lacking. Health status and geographical location are important factors as they are known to influence physical activity behaviour, both directly and indirectly by influencing other determinants (including beliefs, attitudes and knowledge).[14]

Research examining exercise behaviours in relation to each of the FITT principles and improving our understanding of why changes in exercise behaviours occur throughout pregnancy is needed to develop targeted interventions which are known to be more effective than generic "one-size-fits-all" interventions in pregnant women.[15] The purpose of the current study was to examine the frequency, intensity, time and type of exercise behaviours undertaken by regionally based pregnant women before and during pregnancy.

2. Methods

A convenience sample of pregnant women currently accessing prenatal care were invited to participate in the study via recruitment materials (posters and flyers) displayed in 11 geographically dispersed medical practices within the Rockhampton region of Central Queensland, Australia. An information sheet outlining the purpose of the study was attached to each of the surveys for potential participants to read. No incentive for completion was offered. Participants were not identifiable and informed consent was assumed on the completion and return of the hardcopy survey to the reception desk at the medical practice. Data was collected between March–September, 2014. The Central Queensland University Human Research Ethics Committee gave approval to conduct the study (H14/02-031).

The 53-item survey instrument was developed after an extensive review of the both previous research literature and previously developed questionnaires examining pregnant women's physical activity patterns, perceptions and beliefs about exercise during pregnancy.[16,17] The survey was then pilot tested ($n = 12$) among medical practitioners, academic researchers and postgraduate students who provided feedback that contributed to the final version of the instrument. As part of a larger study, the survey consisted of three sections that in turn examined participants' demographic characteristics, beliefs regarding exercise during pregnancy, and exercise behaviours both before and during pregnancy. However, only participants' demographic characteristics and exercise behaviours have been reported in the current paper.

Demographic characteristics assessed included age, combined household income, marital status, level of education, employment status, whether or not participants had other children, gestational age of the baby, and whether or not respondents were accessing private or public health care for their prenatal care. The Godin Leisure-Time Exercise Questionnaire (GLTEQ),[18] for which content validity and test-retest reliability have been previously established, was then used to examine participants self-report of exercise frequency, intensity and time before and during pregnancy. The GLTEQ tool was adapted for the purpose of this study to also examine the types (aerobic exercise, flexibility training, strength training or other) of exercise respondents participated in. Time to complete the survey was approximately 10 min.

Descriptive statistics were calculated for all demographic and exercise behaviour data. Chi-square analysis examined differences in the proportion of responses in each of the FITT categories. Statistical significance was accepted at an alpha level of $P < 0.05$. Data analysis was performed using Statistical Package for the Social Sciences Version 20 (IBM Corp, NY).

Table 1
Demographic characteristics of 142 pregnant women respondents.

Variable	*N* (%)
Australian citizen	134 (95)
English as primary language	139 (97.9)
Age (years)	
18–24	23 (16.2)
25–34	98 (69)
35+	21 (14.8)
Annual combined household income	
Less than $50,000 per year	9 (6.3)
$50,001–$100,000 per year	49 (34.5)
$100,001–$150,000 per year	41 (28.9)
More than $150,000 per year	34 (23.9)
Unsure/Would rather not say	9 (6.3)
Highest level of education	
Secondary/high school	35 (24.6)
Technical or further educational institution (inc TAFE)	35 (24.6)
University or other higher education institution	71 (50)
No Schooling	1 (0.7)
Current employment status	
Full-time	70 (49.3)
Part-time/casual	36 (25.4)
Unemployed	1 (0.7)
Student	4 (2.8)
Home duties	26 (18.3)
Self-employed	5 (3.5)
Marital status	
Married/de facto/in a relationship	139 (97.9)
Single/divorced/separated/widowed	3 (2.1)
How many children do you currently have	
None	57 (40)
1 child	53 (37.3)
2 children	21 (14.8)
3 or more children	11 (7.7)
First pregnancy	
Yes	55 (38.7)
No	87 (61.3)
Gestation	
First trimester	34 (23.9)
Second trimester	39 (27.4)
Third trimester	69 (48.7)
Pre-natal care system	
Private care system	35 (24.6)
Public care system	107 (75.4)

3. Results

The demographic characteristics of the 142 respondents are shown in Table 1. Participants were primarily Australian citizens (95%), spoke English as their first language (98%), aged 25–35 years (69%), married (93%) and in some form of employment (74%). Just under half of the respondents were in their third trimester of pregnancy (49%) and with their first child (40%). Over two-thirds of the participants (75%) were accessing public prenatal health care at the time of this study.

Table 2 shows a significant reduction in exercise participation during pregnancy compared to before pregnancy ($\chi^2 = 31.66$, $p < 0.05$). Of those that continued to exercise, there was a significant reduction in the number of pregnant women meeting exercise guidelines ($\chi^2 = 8.55$, $p < 0.05$). Exercise frequency ($\chi^2 = 111.63$, $p < 0.05$), intensity ($\chi^2 = 67.41$, $p < 0.05$), and time/duration ($\chi^2 = 114.33$, $p < 0.05$) also significantly decreased from before pregnancy to during pregnancy. Just under a third (27%) of respondents ceased exercise all together once becoming pregnant. Moreover, 64% of respondents reported participating in exercise at least 3–4 times per week before pregnancy. However, exercise frequency decreased significantly among those women who continued to exercise during pregnancy, with 58% of participants reporting exercising only 1–2 times per week.

Eighty-seven active women (70%) in the study participated in exercise at either a 'moderate', 'hard' or 'very hard' intensity before