

Women's reported health behaviours before and during pregnancy: A retrospective study

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Ms Jenna Smedley (BSc(Health Promotion))
Western Australian Centre for Health Promotion Research
School of Public Health, Curtin University
GPO Box U1987
Perth, Western Australia 6845

Dr Jonine M Jancey PhD *
Western Australian Centre for Health Promotion Research
School of Public Health, Curtin University
GPO Box U1987,
Perth, Western Australia 6845
J.Jancey@curtin.edu.au

Dr Satvinder Dhaliwal
Epidemiology & Biostatistics
School of Public Health, Curtin University
GPO Box U1987
Perth, Western Australia 6845
S.Dhaliwal@curtin.edu.au

Dr Yun Zhao PhD
Epidemiology, Biostatistics and Public Health
School of Public Health, Curtin University
GPO Box U1987
Perth, Western Australia 6845
Y.Zhao@curtin.edu.au

Ms Ginny Monteiro (MHP, BSc(Nutrition))
Western Australian Centre for Health Promotion Research
School of Public Health, Curtin University
GPO Box U1987
Perth, Western Australia 6845
G.Monterio@curtin.edu.au

Professor Peter Howat PhD
Centre for Behavioural Research in Cancer Control
Curtin University
GPO Box U1987
Perth, Western Australia 6845
p.howat@curtin.edu.au

* Corresponding author

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Abstract

Objective: This study aimed to determine women's reported health behaviours (physical activity, diet, weight management) before and during the pregnancy; and to identify sources of health information.

Design: Retrospective study incorporating quantitative (a self-completed survey) and qualitative (one-on-one interviews) methods.

Methodology: Participants were women aged 18 or over; had no pre-existing medical condition that might be exacerbated during pregnancy (e.g. diabetes, heart condition); and had given birth in the last 12 months. Nineteen women agreed to one-on-one interviews and 100 women agreed to complete a mailed questionnaire. Qualitative data and quantitative data were analysed using a descriptive qualitative methodology and by using McNemar's test for correlated proportions, respectively.

Results: Participants reported a significant reduction in their level of physical activity during pregnancy; a significant increase in consumption of fruit, vegetables and fibre, and a decrease in fast food consumption (all $p < 0.05$). Medical practitioners are the preferred source of health information but seem to provide insufficient information about health behaviours during pregnancy, in relation to physical activity, diet and weight management.

Conclusion: Women reported eating a healthier diet and reducing their level of physical activity during the antenatal period, compared to pre-pregnancy. There is a need to improve the provision of health information on physical activity, diet and weight management in the antenatal period.

Key words: Physical activity, healthy eating, weight gain, antenatal, obesity

Introduction

Over the last two decades overweight and obesity rates have reached epidemic proportions worldwide, with no evidence that these levels are abating⁽¹⁻³⁾. Globally, obesity rates have almost doubled in adults^(2, 4, 5) and children are also 'getting fatter'^(6, 7).

In Australia, 54 per cent of the adult population are overweight⁽⁸⁾. More specifically, 35 per cent of Australian women of child-bearing age (ages 25-35) are overweight or obese⁽⁹⁾.

Similarly, in the United Kingdom (2004) 41 per cent of women are overweight (25%) or obese (16%)⁽¹⁰⁾ and in the United States in the 20-39 age group, 52 per cent are overweight and 29 per cent are obese⁽¹¹⁾. For women most weight gain occurs between the ages of 25–44, the period recognised as the child-bearing years⁽¹²⁾.

This has public health implications as obesity is associated with many medical conditions and is linked to an increase in mortality⁽¹³⁾. Associated medical conditions include; insulin resistance and type II diabetes, stroke, sleep apnoea, high blood pressure, dyslipidaemia, cardiovascular disease, gall bladder disease, hyperuricemia, osteoarthritis and some cancers⁽¹⁴⁾. Likewise, there is risk to the foetus, such as congenital abnormalities⁽¹⁵⁾ and susceptibility to overweight and obesity in childhood and into adulthood^(3, 16-22).

Obesity is linked to an imbalance between energy input and energy expenditure, which often results from a high calorie diets and increasing sedentary behaviours^(1, 2, 5, 22). Studies indicate that a significant proportion of the population do not achieve the recommended levels of fat, fibre, sugar, zinc, calcium and iron⁽²³⁾ and that pregnancy is a life event which promotes a sedentary lifestyle⁽²⁴⁾. Participation in physical activity is lower among pregnant women than non-pregnant women, with most women decreasing their level of physical activity within the first 20 weeks of pregnancy⁽²⁵⁾. This is despite the recommendations for

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pregnant women who have uncomplicated pregnancies to be physically active for 30 minutes or more on most, if not all days of the week ⁽²⁶⁾.

Despite the plethora of evidence regarding the benefits of a healthy lifestyle in disease prevention, women continue to conceive while having a BMI greater than 25 ⁽²⁷⁾, gain excessive gestational weight ^(28, 29), become increasingly less active ⁽²⁵⁾ and eat calorie dense nutrient poor foods ⁽³⁰⁾. Transition into motherhood should occur with well-established health behaviours, so as to optimise health outcomes of both mother and offspring.

This means that the short and long term health status of women and children are being significantly compromised by factors such as pre-pregnancy weight, excessive gestational weight gain ^(28 #24), poor diet and physical inactivity ⁽³¹⁾. This study aimed to determine women's reported health behaviours (physical activity, diet, weight management) before and during the pregnancy; and to identify sources of health information.

Methodology

This research incorporates both qualitative (one-on-one interviews n=19) and quantitative (self-completed survey n=100) methods. The survey questions assessed the participant's knowledge and behaviours around physical activity, healthy eating and weight gain prior to and during pregnancy, as well as sources of health information. This retrospective study assessed participant's behaviour at pre-pregnancy and during pregnancy. This approach provides an accurate description of human behaviour ⁽³²⁾ especially in health research ⁽³³⁾, with the qualitative data providing meaning and explanation of the quantitative data.

Participants

One-hundred participants completed the self-complete questionnaire and 19 completed the one-on-one interviews. For inclusion in the study participants were required to: be aged 18 or

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Procedure

Participants were recruited through promotion of the research at mothers groups, playgroups, immunisation clinics, child health clinics, libraries and community events. The project was conducted in two phases: a) one-on-one interviews; and b) a self-complete questionnaire. Human Research Ethics Approval was obtained (PH-63-2011).

Interviews

Participants (n=19) were contacted by telephone to arrange a convenient time and place to meet the researcher. Prior to commencement of the interviews, participants completed a consent form and agreed to the recording of the interview. The semi-structured interviews were up to 45 minutes in duration. Interviewees were provided with a movie voucher as an incentive.

Self-complete survey

The questionnaire was posted to 140 potential participants with a reply paid envelope after informed consent was obtained. This enabled the survey to be completed at a convenient time. Completion time was approximately 10 to 15 minutes. Participants who had not returned the questionnaire after two weeks were followed-up by email or telephone. Participants who completed and returned a questionnaire entered a draw to win one of five \$200 shopping vouchers.

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Instruments

Interview schedule

An interview schedule was developed for the interviews. The schedule contained questions on physical activity, healthy eating, gestational weight gain; and sources of health information. The questions were devised after a comprehensive review of the literature^(24, 35-39), reviewed by physical activity and nutrition experts and pilot tested. (See Appendix A for example questions).

Self-complete survey

The questionnaire collected data on physical activity, diet and weight management behaviours, as well as sources of health information. The questions were based on previously tested research instruments^(25, 40, 41). Responses to physical activity and dietary items were recorded using a five-point Likert-scale. During analysis, variables for physical activity and dietary behaviour (*did 30 minutes of moderate physical activity daily; or ate two serves of fruit and five serves of vegetables daily*) were re-coded into three categories to increase statistical power: 'never' (never + rarely): 'sometimes' (sometimes) and 'always' (often + everyday). Similarly, the weight-related attitude questions were re-coded into three categories 'agree' (strongly agree + agree), 'disagree' (strongly disagree + disagree) and 'not sure'.

Data Analysis

Interviews

Each interview was digitally recorded and fully transcribed verbatim, and descriptive qualitative analysis was conducted. The analysis involved breaking down the transcribed data

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Self-complete survey

Statistical analysis was conducted with SPSS 18.0 and p-values were assessed at the 5% level of significance. McNemar's test was used to assess the changes in the outcome variables between the two time periods under investigation, before pregnancy and during pregnancy. Net change is calculated as the difference between the percentage of participants who improved, by moving to a higher category, and the percentage of subjects who were classified in a lower category of the outcome variable. P-values were computed from McNemar's test for correlated proportions.

Results

This section focuses on the results of the quantitative data (n=100). Quotes from the interviews are included to complement the data and to provide meaning.

Demographics

Of the 140 participants who agreed to participate in the quantitative survey, 110 returned the questionnaires, of which 100 (71.4%) were used in the analysis. Participants were excluded if the survey was incomplete or was received after the deadline. All 19 participants consenting to the interviews participated in the study.

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The mean age of survey participants was 29.9 years (SD=4.605), the majority were Australian-born (70%), 29 per cent were overweight (18%) or obese (11%), most were married (97%), had one child (88%) and were university educated (58%). The characteristics of the survey and interview participants are presented in Table 1.

[Insert Table 1 about here]

Reported physical activity and dietary practices before and during pregnancy

The percentage of participants in each of the categories 'never', 'sometimes' and 'always' before and during pregnancy is presented in Table 2. Participants' intake of fruit, vegetable and fibre significantly increased during pregnancy (all $p < 0.003$). Significant reductions in physical activity ($p = 0.001$) and fast food intake ($p = 0.017$) were observed among participants during pregnancy.

[Insert Table 2 about here]

Net behavioural change in physical activity and diet before and during pregnancy

The significant physical activity and dietary behaviours reported by the participants during pregnancy are summarised in Figure 1. There was a significant net increase in consumption of fruit (16%), vegetables (21%) and fibre (26%), and there was a significant net decrease in physical activity (29%) and fast food consumption (17%).

[Insert Figure 1 about here]

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Weight Management

Fifty-three per cent of women reported that they 'agreed' that as long as they consumed a healthy diet during pregnancy, weight gain was not a concern; 34 per cent 'disagreed' and 11 per cent were 'unsure'. Similarly, 48 per cent of women 'agreed' that as long as they were physically active during pregnancy, weight gain was not a concern, while 38 per cent 'disagreed', and 14 per cent were 'unsure'.

Sixty-three per cent of those women in the healthy weight range (BMI=18.5–25) and 59 per cent of those women in the overweight (BMI=25.1–30) (n=18) and obese weight range (BMI >30) (n=9) reported gaining excessive weight during pregnancy, according to the Institute of medicine (IOM) guidelines ⁽⁴³⁾.

Sources of health information

Fifty per cent (n=50) of women reported receiving information on physical activity from doctors (GP's, obstetricians or gynaecologists). For example "*he just told me to continue what I'm doing, but I don't do anything, so I just didn't do any*". Fifty-four per cent (n=54) received information on healthy eating, "*they mainly talk about listeria*" and 39 per cent (n=39) received information regarding weight gain, "*well he weighed me and I said that I was weighing myself and he goes well I'm not worried about it and we didn't really discuss it further than that*" and "*I was weighed every time, but I had no idea what I should have weighed*", "*no one told me what I should or should not be gaining*", "*no one told me that, that would concern me, I would like to know what they call excessive weight*". Information sources other than doctors were "[radio] *the Christian channel*", "*Dr Google*" and "*books, but they all say something different*". Women indicated they preferred to receive information

Women's reported health behaviours before and during pregnancy: A retrospective study from their doctor because *"people tend to trust doctors"*, *"they know what they're talking about"*, *"it's not a load of hocus pocus"* and *"people see them as God's"*.

Discussion

Physical activity behaviour

Pregnancy is a life event that seems to support sedentary behaviours^(44, 45). Although physical activity can be a protective factor for many pregnancy related disorders, this research indicates that too few pregnant women are sufficiently active⁽³¹⁾. This is a public health concern as physical inactivity may increase a pregnant woman's risk of gaining excessive weight and developing illnesses such as preeclampsia and gestational diabetes^(46, 47).

This study found that women who report being physically active before pregnancy are more likely to remain physically active during pregnancy, compared to those who report being physically inactive before pregnancy. However, a large number (40%) of healthy, otherwise active women decreased their physical activity during pregnancy. Comments by the women gave some insight into why this was so. *"I've got an exercise bike at home but I haven't really been on that since I got pregnant cause I lost my energy"* and *"I was doing a lot of walking, Pilates and yoga. I didn't do any of that at all while I was pregnant, I completely stopped"*.

Remaining physically active during pregnancy is extremely important as it predicts a greater likelihood of post-partum physical activity⁽⁴⁸⁾. Rarely does physical activity return to the same levels after childbirth, with an increase in physical activity post pregnancy unlikely for most women^(49, 50). However, women indicated that the excess weight inhibited physical activity, with statements such as: *"I tried to keep walking but by the end it lessened because*

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after about 10 minutes I was sore, I could feel the pressure and I couldn't be bothered... it took a long time to get back into it afterwards". This supports the need for alternative forms of physical activity, such as water-based activities to be available and promoted by health practitioners to women in the early stages of pregnancy.

Dietary behaviour

To date there are few studies that have investigated the dietary behaviours of pregnant women⁽³⁰⁾. In this study, almost two-thirds of women reported they met the Australian recommendations for fruit and vegetable consumption⁽⁵¹⁾. This is in contrast to a studies conducted in New South Wales (NSW)⁽³⁰⁾ and Queensland (QLD)⁽²⁷⁾ Australia with pregnant women, whereby few women reported eating the recommended daily intake of fruit (9.2% (NSW); 13% (QLD)) and vegetables (2.7% (NSW); 7% (QLD)), and about one-third reporting that they consumed half the recommended serves of fruit and one-third of the recommended serves of vegetables. The lower reported levels of fruit and vegetable consumption in these two studies may reflect the lower education level of the participants. More than 60% of participants in this study were university educated, while more than 60% of participants in the QLD study and 77% in the NSW study did not finish high school. The reported level of income was also lower in these studies, highlighting the impact of socio-economic factors on health behaviours^(52, 53).

The women in this study did report making significant changes to their diets during pregnancy. The decreased consumption of fast food may be related to public education in Australian aimed at women in their first trimester that informs them of foods to avoid for Listeria⁽⁵⁴⁾. This demonstrates the capacity of public health education programs and the positive impact that health professionals can have on pregnant women's health behaviour. It

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Weight management

Maternal obesity during pregnancy is linked to a number of adverse outcomes for mother and child^(15, 55). However, as with previous research^(25, 56), more than half the participants in this study reported that they gained weight beyond those recommended for pregnancy⁽⁴³⁾.

Assessment of weight is a routine antenatal care procedure, yet the majority of women had little or no idea of the importance of gestational weight gain on health, with typical comments such as, "*I was weighed every time, but I had no idea what I should have weighed*".

The lack of concern for weight gain reported by the women in this study may reflect their lack of knowledge about the health implications of excessive weight gain. This indicates a need for weight management education during the antenatal period so that women understand the healthy weight gain parameters and the implications of excessive weight gain for themselves and their unborn child. Research indicates that education around weight management does affect pregnant women's weight gain⁽²⁷⁾. The optimal impact of weight management advice is achieved when medical professionals commence education at the time of pregnancy confirmation and this is continued throughout the pregnancy⁽⁵⁷⁾.

Sources of health information

Women identified doctors as a trusted and reliable source of information, as with other studies⁽⁵⁸⁾. Yet on average less than half the participants in this study were in receipt of information from doctors regarding physical activity, healthy dietary intake and gestational

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weight gain. Those who did receive information suggest that this sometimes occurred due to the presence of illness. They stated that they *"would not have got it (information) if I hadn't developed gestational diabetes"*. Research with pregnant women in Victoria, Australia found that women with a greater risk of birthing complications experienced more proactive antenatal care ⁽⁵⁹⁾. This suggests that maternal health care providers are investing time and prioritising women after they have been identified as 'at risk'. This highlights the need for the provision of care and delivery of education during early pregnancy with a focus on prevention. Many women in this study view doctors as *'God's'* and consequently believe what they say, and are therefore more likely to do what they recommend. *"If the doctor had said do 30 minutes of exercise a day I would have, but he didn't"*.

Limitations

This study relied on self-report data. However studies with pregnant women have found fewer discrepancies between self-report and objectively measured data ⁽⁶⁰⁾. The relatively small sample size and the relatively high education level of many of the participants may limit the generalisability of the results.

Conclusion

Maintaining levels of physical activity, eating a healthy diet and weight management are important health behaviours for pregnant women and their unborn child. This study indicates that pregnancy provides an opportunity for women to reassess their current health behaviours and an opportunity for health professionals to support positive behavior change. Structuring health systems so that they support women to adopt and maintain positive health behaviours

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should be a public health priority. Further research should be conducted with health professionals to gauge how they perceive their role in the care of pregnant women, along with the exploration of appropriate interventions during the antenatal period

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Conflict of interest

The Authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

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Appendix A

Summary of Interview schedule

General questions

Many health professionals talk about planning for pregnancy, what do you think planning for pregnancy means?

What things did you do to stay healthy during pregnancy or try to ensure you had a healthy baby?

Overall, what information were you given about having a healthy pregnancy?

Where did you get this information from?

Do you think that becoming pregnant means changing any of your behaviours?

Is pregnancy a good time to make lifestyle changes (explain lifestyle change)?

Physical activity

What does physically activity mean to you?

Do you currently engage in regular physical activity?

Do you think there is value in being physically active during pregnancy?

Can you tell me why you think you and other pregnant women may not participate in Physical activity?

Diet

What does healthy eating mean to you?

Do you think that diet has an effect on your health or the baby's health during pregnancy?

What would make healthy eating more appealing?

Can you tell me why you think you and other pregnant women should eat a healthy diet?

Weight during pregnancy

Some experts say that being overweight can affect the health of a pregnant woman and her baby. What do you think about that?

Do you know the weight gain recommendations for pregnancy?

Why do you think it's important to maintain a healthy weight?

TABLE 1 Demographics of survey group and interview group

	Survey Group N =100 (%)	Interview Group N =19 (%)
Age (yrs)		
18-24	11	5
≥25	89	95
BMI		
Healthy weight (18.6-25.0)	69	53
Overweight (25.1-30.0)	20	21
Obese (> 30.1)	11	26
Country of birth		
Australia	70	74
Other	30	26
Marital Status		
Married/De facto	97	95
Single	3	5
Education		
Completed up to high school	20	10
Completed technical college	22	42
Completed university	58	48
Employment Status		
Employed	91	68
Unemployed	9	32
Annual Income (\$)		
<80 999	33	37
>81 000	67	63
Smoking status		
Non-smoker	68	95
Ex-smoker	18	0
Smoker	4	5
Children		
One child only	88	37
More than one child	12	63

TABLE 2 Reported physical activity and dietary intake before and during pregnancy (N=100).

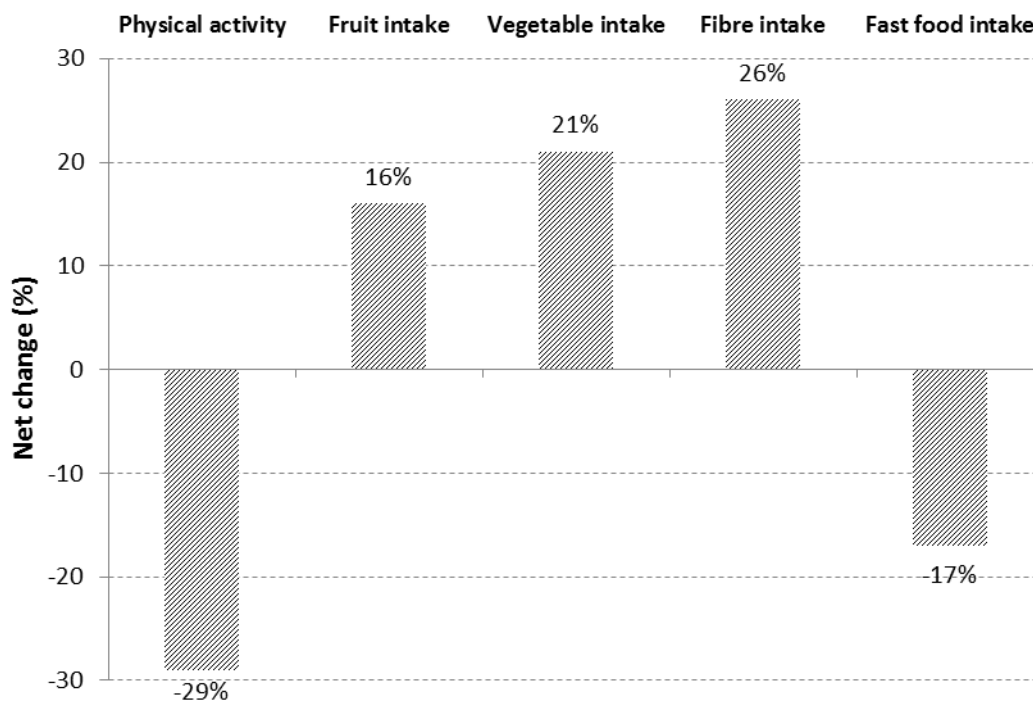
	Before pregnancy (%)	During pregnancy (%)	P value
Physical Activity			
Never	8	28	0.001
Sometimes	29	26	
Always	63	46	
Fruit intake			
Never	10	5	0.002
Sometimes	25	17	
Always	65	78	
Vegetable intake			
Never	10	5	0.001
Sometimes	29	18	
Always	61	77	
Fibre intake			
Never	22	8	0.001
Sometimes	23	16	
Always	55	76	
Fried food intake			
Never	42	51	ns
Sometimes	48	38	
Always	10	11	
Fast food intake			
Never	56	67	0.017
Sometimes	34	28	
Always	10	5	
Sweet bakery intake			
Never	38	40	ns
Sometimes	47	40	
Always	15	20	

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Sweet Dairy intake			
Never	25	27	
Sometimes	41	32	ns
Always	34	41	

Marginal percentages are presented and p-values computed from McNemar's test for correlated proportions. Note: ns denotes not statistically different ($p > 0.05$)

FIGURE 1 Net change in physical activity and dietary behaviour during pregnancy.



Variable	Comparison from pre-pregnancy to during pregnancy			P value
	% worse	% same	% improved	
Physical activity	40	49	11	0.001
Fruit intake	11	62	27	0.022
Vegetable intake	6	67	27	0.001
Fibre intake	3	68	29	0.001
Fast food intake	28	61	11	0.017

Net change is defined as the difference between the % improved and % worse. P-values computed from McNemar's test for correlated proportions.