



# Informing maternity service development by surveying new mothers about preferences for nutrition education during their pregnancy in an area of social disadvantage



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## ABSTRACT

**Background:** A demonstrated link exists between maternal diet and maternal and infant health outcomes during and after pregnancy. A dietetic maternity service (0.6FTE for 3500 births) was introduced in 2012 at our hospital in a socially-disadvantaged area. We needed to develop evidence-based, patient-oriented improvements to nutrition services within resource limitations.

**Aim:** This cross-sectional study gathered knowledge, eating behaviours, and nutrition-related needs of our women ante- and postnatally to inform this process.

**Methods:** Women ( $\geq 18$  years) admitted to the postnatal ward completed our survey. Data including dietary quality, nutritional knowledge and interest in nutrition education were collected. Analysis included descriptive, chi-squared and *t*-tests.

**Findings:** Three hundred and nine eligible women responded ( $28 \pm 6$  years,  $27 \pm 7$  kg/m<sup>2</sup> pre-pregnancy body mass index, 12% gestational diabetes). Two-fifths (42%) self-reported gaining excess weight during pregnancy. One quarter reported knowing their gestational weight gain goals, yet only 1.6% was correct. Half reported interest in receiving nutrition education during pregnancy and post-delivery (45%,  $n = 134$ ; 43%,  $n = 123$ , respectively). Women had poor diet quality (daily serves – fruit:  $1.8 \pm 1.0$ ; vegetables:  $2.0 \pm 1.2$ ; dairy:  $1.9 \pm 1.2$ ), despite identifying healthy eating as a personal priority. Nutrition topics requested included healthy eating for development of baby pre- and post-delivery and maternal weight management.

**Conclusion:** Women attending our hospital have dietary issues and levels of interest in nutrition similar to women in tertiary maternity centres. Service changes planned will explore formats that meet higher and lower education levels; group workshops may be supplemented by formats such as internet and DVD-delivered education to overcome access and literacy issues, respectively.

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## 1. Introduction

A poor quality diet during pregnancy is associated with unhealthy gestational weight gain (GWG),<sup>1,2</sup> preeclampsia,<sup>3</sup> anaemia,<sup>4</sup> preterm birth or miscarriage.<sup>5</sup> It is also associated with poor infant outcomes, including inadequate development,<sup>6</sup> low birth

weight,<sup>7</sup> preterm birth,<sup>8</sup> macrosomia,<sup>9</sup> and an increased risk of chronic diseases later in life.<sup>10</sup> These outcomes have financial costs associated with hospital delivered care (e.g. assisted deliveries, longer hospital stays, neonatal intensive care admissions) and ongoing public health costs (e.g. management of overweight/obesity, Type 2 diabetes mellitus and other co-morbidities). Furthermore, maternal diet and lifestyle factors affect foetal programming and hence influence longer pregnancy outcomes, including the risk of infants developing (obesity-related) chronic diseases in adulthood.<sup>10</sup> A negative relationship between body mass index and education or occupation are also common in women.<sup>11</sup>

Few effective models of care for nutrition and maternal health services are known to exist.<sup>12</sup> Evidence-based care is recognised as

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a valuable construct in the delivery of high quality, cost effective health care. It is underpinned by clinician's knowledge and experience, plus the evidence available from good research and importantly the values and needs of the patient and the context in which the health care is being provided.<sup>13</sup> Thus, determining women's needs and preferences can help to ensure that services developed, adapted or adopted meet women's needs. This has already been demonstrated in maternity centres in higher socio-economic areas.<sup>14,15</sup> However the information and educational needs and preferences of women attending maternal services from lower socio-demographic populations have not previously been evaluated.

Less than 10% of women meet pregnancy fruit and vegetable guidelines and a large proportion gain more than their goal GWG range.<sup>14–19</sup> These GWG guidelines originated from the U.S. Institute of Medicine (IOM)<sup>20</sup> and have been adopted in the Australian Dietary Guidelines.<sup>21</sup> The IOM guidelines advise on GWG based on a woman's pre-pregnancy BMI and are underpinned by research and data modelling that ensures attainment of the guidelines gives the greatest chance for the best outcomes for both mother and baby. Despite their importance, these topics (GWG and adequate fruit and vegetables) remain low on women's pregnancy 'dietary agenda' who tend to focus on foods to avoid, particularly those they believe to contain *Listeria monocytogenes*.<sup>22</sup> Despite having the potential to result in serious consequences (e.g. miscarriage, stillbirth), these occurrences are very rare (37 seven cases of *L. monocytogenes* were reported in the last three years in Australia (~370,000 births; <1% of pregnancies/year)<sup>23,24</sup>). When this rate is compared with the outcomes of overweight, obesity and excessive GWG, including increased risk of gestational diabetes mellitus (GDM), macrosomia, increased caesarean sections, decreased breastfeeding rates, and postpartum weight retention,<sup>25,26</sup> which are potentially experienced by over 30–50% of Queensland women,<sup>27</sup> a misplaced focus is recognised.

In January 2012 a women's health dietetic service (0.6 full time equivalent dietitian) was introduced at a hospital with a 32-bed maternity ward with 3500 births per year, in a socially disadvantaged region of south-east Queensland. In order to assist in the process of implementing evidence-based, patient-oriented nutrition services at this Hospital, we aimed to gather knowledge, eating behaviours, and nutrition-related needs during pregnancy and postnatally of women admitted to the postnatal ward.

## 2. Subjects and methods

This cross-sectional study was approved by the Metro South Health Service District Human Research Ethics Committee (HREC/12/QPAH/155).

### 2.1. Eligible patients

We invited women aged at least 18 years who were admitted to the postnatal maternity ward at a hospital in a socially disadvantaged area ~28 km south of Brisbane (Queensland, Australia) to complete our survey. Informed consent was implied if a woman completed a survey. Women who had previously completed our survey, were away from their bed, asleep or undergoing medical care at the time of survey administration, or could not communicate in English were not invited to participate.

### 2.2. Data collection

The survey was distributed on weekdays, excluding public holidays, between 18th May 2012 and 8th October 2012 by two accredited practising dietitians and two dietetic students using a standard verbal script. Eligible patients were provided with a survey, pencil and self-addressed, stamped envelope. After

completion, eligible patients were encouraged to place the survey in the envelope and either give it to the administrative officer on the maternity ward. To increase response rates, dietitians routinely administered surveys on multiple occasions over the day and revisited the ward at the end of the day to collect surveys. Researchers monitored the number of surveys distributed and returned in order to determine response rate.

### 2.3. Survey design

The survey was based on one previously administered at the Mater Mother's Hospital.<sup>12</sup> The survey was piloted by six allied and nutrition assistants to confirm legibility, understanding and acceptable length of time to complete. The self-reported survey collected demographic and anthropometric data, including height, pre-pregnancy weight, GWG reported in kg over the entire pregnancy, Aboriginal and/or Torres Strait Islander (ATSI) status as conditions originating in the antenatal/perinatal period is the 10th leading cause of death in our indigenous population in Australia during 2006–2010,<sup>28</sup> education level, and dietary quality. Dietary quality was assessed with a valid tool that asked number of serves of fruit, vegetables and dairy products consumed per day (which has been shown to reflect 75% of the variance in a woman's diet).<sup>29</sup> Postnatal women were considered to have similar diets as they had in late pregnancy, and therefore when assessing diet quality the Australian Guide to Healthy Eating recommendations for pregnancy were used.<sup>30</sup>

Importance of healthy eating was rated on a Likert scale, with 1 being not important to 5 being very important. The survey inquiring about the level of importance respondents had placed on healthy eating and returning to pre-pregnancy weight during pregnancy, at time of survey completion, and in the future. The survey inquired about women's interest in nutrition education both antenatally and postnatally, topics of interest (open-ended), their preferred mode of education delivery (lecture, discussion group, workshop), location of education (hospital, community centre) and education length (30, 45, or 60 min). The survey also collected knowledge of *L. monocytogenes* and whether women had made dietary modifications based on preventing *Listeria* risk (yes/no), knowledge of recommended GWG goals (respondents could insert a weight gain range in kg), current breastfeeding behaviour, days since delivery and whether they had Type 1 or Type 2 diabetes mellitus, or GDM and their treatment method. Finally they were asked number of babies they had delivered and if they had received nutrition education during previous pregnancies and what was most helpful.

During pregnancy, data are routinely collected for all mothers birthing at the hospital as part of Queensland Health's Perinatal Data Collection. This includes: self-reported height and pre-pregnancy weight, age, frequency of multiple pregnancies, intention to breastfeed, ATSI status and diagnosis of GDM.

### 2.4. Data analysis

Quantitative data were entered and analysed in SPSS version 20 (SPSS, Chicago, IL, USA). Descriptive statistics were undertaken for all variables. Chi-squared and independent samples *t*-tests were used to compare demographics of survey respondents with all mothers who delivered at the hospital during May to October 2012, and to compare outcomes against pre-pregnancy BMI. GWG was assessed against pre-conception BMI. GWG was then categorised as either: excessive, insufficient or within recommended range according to IOM GWG guidelines.<sup>20</sup> Extra coding categories of 'rounded up' (GWG goal rounded up to the nearest whole number) and 'rounded down' (GWG goal rounded down to the nearest whole number) were created when assessing GWG knowledge.

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