



Original article

Effect of diet and exercise intervention in Chinese pregnant women on gestational weight gain and perinatal outcomes: A quasi-experimental study

Yan Qun Liu^a, Yun Liu^a, Yun Hua^b, Xiao Li Chen^{a,*}^a Wuhan University School of Health Sciences, Wuhan University HOPE School of Nursing, 115 Donghu Road, Wuchang, Wuhan, Hubei Province, China^b Wuhan Women and Children Medical Care Center, 100 Xianggang Road, Hankou, Wuhan, Hubei Province, China

ARTICLE INFO

Article history:

Received 20 November 2016

Revised 21 March 2017

Accepted 20 May 2017

Keywords:

Lifestyle intervention

Obesity

Pregnant women

Physical activity

ABSTRACT

Aim

To determine the effect of a diet and exercise intervention in pregnant women on total gestational weight gain, weekly weight gain, 42-days postpartum weight retention, mode of delivery, and infant birth weight.

Methods: One hundred and one eligible Chinese pregnant women whose pre-pregnancy body mass index ranged from 18.5 to 24.9 were recruited between June 2013 and June 2014 from a tertiary hospital. Ninety participants, 45 in each group, completed the study. Intervention women received three face-to-face interventions and three follow-up phone calls which were developed based on the Transtheoretical Model. Gestational weight was measured at each prenatal check. Mode of delivery and infant birth weight were collected from the medical record. The 42-days postpartum weight was measured during the postpartum visits.

Results: (1) The total gestational weight gain and mean weight gain per week in the intervention group were significantly less than the control group ($P = 0.045$ and $P = 0.008$ respectively). (2) Infant birth weight was significantly lower in the intervention group ($P = 0.012$). (3) Postpartum weight retention was significantly less in the intervention group ($P = 0.001$). (4) There were not significant differences in mode of delivery. (5) Infant birth weight was significantly less than the control group ($P = 0.012$).

Conclusions: The lifestyle intervention significantly reduced gestational weight gain, optimized infant weight and lowered postpartum weight retention. Promotion of gestational weight management is needed and cultural health beliefs about pregnancy and postpartum practices should be considered when developing the intervention plan.

© 2017 Elsevier Inc. All rights reserved.

Introduction

Globally, the prevalence of women with a body mass index (BMI) of 25 or greater increased from 29.8% in 1980 to 38.0% in 2013 (Ng et al., 2014). In China, 27.4% of women over 20 years of age were overweight in 2013 (Ng et al., 2014). Maternal overweight or obesity is highly prevalent (Heslehurst et al., 2010; Poston et al., 2015). Excessive gestational weight gain (GWG) is related to maternal obesity (Alberico et al., 2014). Excessive GWG is defined as women's weight gained during pregnancy greater than recommended by the US institute of Medicine (IOM) guidelines based on pre-pregnancy BMI (Institute of Medicine, 2009; Rasmussen & Yaktine, 2013). The American Pregnancy Nutrition

Surveillance System showed that the proportion of excessive gestational weight gain (GWG) was 48% (Dalenius et al., 2012).

Excessive GWG during pregnancy has a significant impact on maternal metabolism and offspring development (Nelson et al., 2010). Excessive GWG increases the risk of hypertension, gestational diabetes, preeclampsia, cesarean delivery, postpartum weight retention and long term obesity for women (Hedderon et al., 2010; Hill et al., 2013; Mamun et al., 2010; Pantasri & Norman, 2014; Van der Pligt et al., 2013). For the infant, excessive GWG can lead to macrosomia and future obesity (Schack-Nielsen et al., 2010) and is associated with fetal distress, neonatal asphyxia and stillbirth (Heslehurst et al., 2008; Fraser et al., 2010; Tsoi et al., 2010).

In 2009, the IOM revised its' recommendations for gestational weight gain based on pre-pregnancy BMI (Institute of Medicine, 2009). For singleton pregnancy, the IOM recommends a gestational weight gain of 11.5–16 kg for women of normal pre-pregnancy BMI (BMI = 18.5–24.9 kg/m²), and 7–11 kg for high pre-pregnancy BMI

* Corresponding author.

E-mail addresses: liuyanqun1984@163.com (Y.Q. Liu), 554852408@qq.com (Y. Liu), 1505964684@qq.com (Y. Hua), chenxl201313@163.com (X.L. Chen).

(BMI = 25.0–29.9). Many hospitals in China utilize IOM guidelines in managing GWG.

Predisposing factors for excessive weight gain during pregnancy include lifestyle, understanding of weight management, psychological factors (stress, anxiety, and depression) during pregnancy, family support and social support (Herring et al., 2008; Hill et al., 2016; Mehta et al., 2011; Fraga & Theme Filha, 2014; Sangi-Haghpeykar et al., 2014). Pregnant woman's education level and family income were also related to GWG (Huynh et al., 2014). Inadequate physical activity, high calories diet and high fat intake were major risk factors for maternal overweight or obesity (Stuebe et al., 2009).

Studies have explored the effect of lifestyle interventions on GWG, but the results are not consistent (Bogaerts et al., 2013; Hill et al., 2016; Jing et al., 2015; Oteng-Ntim et al., 2015; Phelan et al., 2011; Poston et al., 2015). In a Cochrane review, Bain et al. (2015) found a combined diet and exercise intervention tended to reduce weight gain during pregnancy, but there was no clear difference in postpartum weight retention. Of concern, most studies about lifestyle interventions involved obese pregnant women, but only a few studies have been done on pregnant women with a normal pre-pregnancy BMI (Asbee et al., 2009; Phelan et al. 2011; Polley et al., 2002). Due to rapid changes in Chinese society and the economy, as well as the lifestyle of pregnant Chinese women, maternal obesity is currently seen as a major problem for Chinese women (Jing et al., 2015). Perhaps this is because in Chinese culture, people believe that pregnant women should eat more because the fetus needs additional nutrients for growth.

Excessive GWG is a high-risk factor for maternal and infant health. Finding an intervention which will help women achieve the delicate balance between obtaining sufficient gestational weight to nourish the fetus and prevent preterm birth while preventing both excessive maternal weight retention and infant macrosomia is important. Therefore the aim of this study was to determine the effects of a diet and exercise intervention based on the transtheoretical model (TTM) (Prochaska et al., 2002), on total GWG, weekly pregnancy weight gain, 42 day postpartum weight retention, mode of delivery, and infant birth weight among Chinese pregnant women.

Methods

Study design and Setting.

This study was conducted in a maternity outpatient clinic of a large tertiary hospital which has 6000 annual deliveries in Wuhan, China between July 2013 and June 2014. A quasi-experimental study design was used.

Sample.

All women received routine prenatal care in the hospital clinic including measurement of weight, blood pressure, and abdominal circumference. Inclusion criteria were primipars at least 20 years of age, having a single pregnancy confirmed by ultrasound, over 20 weeks of gestation, willing to have a vaginal birth, a pre-pregnancy BMI of 18.5 to 24.9 and understanding of the written Chinese language.

Pregnant women were excluded from the study if they were 1) over 35 years of age; 2) had pregnancy complications such as cardiovascular, digestive, endocrine and reproductive system diseases; 3) had a multiple gestation; and 4) could not have a vaginal birth because of predisposing factors such as an abnormal pelvis, malposition, or uterine fibroids.

Using a power analysis with a significance level of 0.05, a power of 0.80, an estimated effect size of 0.55, and a 30% attrition rate, the sample size was calculated to be 101 by GPower3.1.7. Participants were randomly assigned into the intervention group (50) and control group (51) according to the sequence of enrollment and randomized numbers produced by SPSS 19.0 software.

Ethical Considerations.

Ethical approval for the study was obtained from the participating university and hospital. Written informed consent was obtained from participants who were assured that their involvement was voluntary and that

they could withdraw from the study at any time without prejudice. Participants' ID numbers were used and the list of numbers was kept in a locked file so no person outside of the study could access these names. The participants' right of confidentiality was assured.

Instruments.

Demographic Questionnaire.

A self-designed demographic questionnaire based on a literature review was used to collect data on participants' age, education level, family income level, occupation, weeks of gestation, weight, and pre-pregnancy BMI.

Intervention.

Control group.

At the first prenatal check, the investigator provided routine health education about the effects of excessive gestational weight on pregnancy outcomes and explained the pattern of ideal weekly gain and overall maternal weight gain based on participants' calculated BMI. The maternal health handbook was distributed as a medical record at the first prenatal check which recorded the weight of each prenatal visit, which was a routine prenatal care. Participants were weighed at the postpartum visit which occurred 42 days after delivery.

Intervention group.

The intervention was developed based on the Transtheoretical model (TTM) (Prochaska et al., 2002). TTM is an integrative and biopsychosocial model to conceptualize an intentional behavior change's process that unfolds overtime through a series of stages. It consists of 5 stages in successful behavior change: pre-contemplation, contemplation, preparation, action, and maintenance (see Fig. 1). The stages of change can occur in a linear or nonlinear progression, which depend on the principles of decisional balance, self-efficacy, and processes of change. The pros and the cons are two core components in decisional balance which work together to influence the stage of change. Self-efficacy reflects individuals' degree of confidence in maintaining the behavior change. In addition, cognitive and affective experiential processes and behavioral processes are included in processes of change which help to explain how changes occur.

The education intervention based on the TTM theory was provided after the basic education given to all women. Participants in the intervention group were assessed to determine their readiness for change to control their gestational weight gain during each prenatal visit between 20 and 30 weeks by asking questions congruent with each stage (Prochaska et al., 2002). The intervention appropriate for each stage of change was provided. Of note, at the first contact, at twenty weeks gestation, 25% of the intervention group women were in the precontemplation stage, 62% were in the contemplation stage, and the remaining women were in the preparation or action stage, perhaps suggesting that women were highly motivated to do whatever is best for their fetus/infant. When some women moved back and forth between stages, the appropriate intervention for their current stage of change was again provided. After 30 weeks, four phone calls were made at 32, 34, 36, and 38–41 weeks of gestation to promote and reinforce the intervention. Women were weighed at the postpartum visit at 42 days postpartum (see Fig. 1).

Health management booklet.

The intervention Booklet of Health Management (BHM) during pregnancy was developed by the investigator prior to the study and distributed to the intervention group at the second-time intervention. The intervention booklet (BHM) was based on educational information found in current literature (Asbee et al., 2009; Bogaerts et al., 2013), dietary guidelines for Chinese pregnant women from the Chinese nutrition society (Chinese Nutrition Society, 2010) and suggestions by nutrition experts, health care professionals, and obstetric care experts from two tertiary hospitals in Wuhan. Maternal women' suggestions were also gathered and taken into account prior to the present study. The handbook's content validity was established and tested during a pilot study. The BHM described the benefits and necessary of weight management, the dietary management (controlling food intake, meeting the

Download English Version:

<https://daneshyari.com/en/article/5567404>

Download Persian Version:

<https://daneshyari.com/article/5567404>

[Daneshyari.com](https://daneshyari.com)