



Effectiveness of a theory-based breastfeeding promotion intervention on exclusive breastfeeding in China: A randomised controlled trial

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ABSTRACT

Objective: To investigate the effectiveness of a designed intervention programme on the promotion of exclusive breast feeding during 6 months post partum among Chinese primiparous women, based on the theory of planned behaviour.

Design: Randomised controlled trial.

Setting: A tertiary hospital in Shanghai, China.

Participants: Chinese primiparous women who were able to breastfed their babies and accompanied by either husband or mothers.

Intervention: Participants were randomly divided into the intervention and control group. On the basis of the theory of planned behaviour, mothers in the intervention group received the TPB-based intervention programme, including individual instruction, group education and telephone counselling, whereas both the intervention and control group continued to receive routine nursing care.

Measurements and Findings: Data were collected between October 2013 and June 2014. Initially, 352 participants were included. However, 67 of them dropped out or were lost to follow-up. Finally, 285 participants were included into the analysis, including 157 participants in the intervention group and 128 participants in the control group. Though some bias might exist, rates of exclusive breast feeding were consistently and significantly higher in the intervention group than the control group at 3 days (40.1% versus 10.9%, $P < 0.001$), 6 weeks (57.3% versus 29.7%, $P < 0.001$), 4 months (56.7% versus 15.6%, $P < 0.001$) and 6 months post partum (42.0% versus 10.2%, $P < 0.001$).

Conclusion and implications: The TPB-based breast-feeding promotion intervention is effective in improving exclusive breast-feeding rates in primiparous women. Although the current intervention that provides continued support during the hospitalisation and follow-up at home, problems remains in the workplaces.

Introduction

The benefits of breastfeeding, particularly exclusive breastfeeding (EBF) have been well recognised (Victora et al. 2016). It can reduce the risk of hospitalisation and mortality related to diarrhoea, otitis media, and respiratory infection (WHO 2013a; Victora et al. 2016). Breastfeeding may also decrease the risk of obesity for infants who have been breastfed for more than 6 months in their later life (Scott et al. 2012; Victora et al. 2016). Besides, breastfeeding improves cognition, and children who have been breastfed show higher score in intelligence quotient test and improved performance in school

performance (Horta et al. 2015; WHO 2013b). In addition, long period of breastfeeding is associated with a reduced incidence of breast cancer and ovarian cancer for mothers (Cancer 2002; Chowdhury et al. 2015;).

The World Health Organization (WHO) and United Nations Children's Fund have put forth an objective to increase breastfeeding rates to 75% in the early periods of infants' life, to 50% at 6 months and to 25% at 1 year of age (WHO 2002). However, only a limited number of mothers have complied with such recommendations (Mcisaac et al., 2014). In the study by Guo, 28.7% of infants under 6 months have been exclusive breastfed in central and western China (Guo et al., 2013). Another survey conducted in three cities in China reveals that the EBF

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rate at 6 months is 25.2% (Zhu et al., 2014). The findings of these studies have suggested that few cities and provinces in China have met the international target rates for EBF. In this situation, intervention studies are required.

Breastfeeding practices are determined by a wide range of socio-economic, cultural, and individual factors (Rollins et al., 2016). Research has indicated that improved breastfeeding knowledge and attitude toward breastfeeding are related to positive breastfeeding outcome (Zhang et al., 2009; Jessri et al., 2013). The support or obligation of partner can also affect breastfeeding, and successful breastfeeding practices tend to occur among mothers whose family members support breastfeeding (Gibson-Davis and Brooks-Gunn, 2007; Sherriff et al., 2014). Besides, maternal confidence in their ability to breastfeed is a key factor for sustained breastfeeding and efforts that enhance mothers self-efficacy or behaviour control are effective in prolong breastfeeding duration (Meedya et al., 2014; Chan et al., 2016). In addition, employment is reported to be negatively associated with EBF outcome, and employed mothers have a higher rate of early weaning (Yimyan, 2011). Given the aforementioned factors are malleable and may be changed through interventions, it is plausible that efforts target the enhancement of breastfeeding knowledge, attitude toward breastfeeding, family support, maternal confidence in breastfeeding and preparation for work situation should increase exclusive breastfeeding rate.

The theory of planned behaviour (TPB) is a theory that focuses on health-related behaviour (Ajzen, 1991), and has been used in predicting breastfeeding behaviour (Guo et al., 2016; Bai et al., 2010). The TPB assumes that breastfeeding intention is the most important determinant of breastfeeding, which is influenced by a person's attitude toward breastfeeding, subjective norms, and perceived behavioural control (Ajzen, 1991). Attitude is determined by a mothers' beliefs or expectations about the outcome of breastfeeding, which is related to the knowledge on the benefit and importance of breastfeeding. Subjective norm is determined by mothers' subjective belief about the approval or disapproval of breastfeeding from people important to them (e.g., Husbands, grandmothers). Perceived breastfeeding control is mothers' belief in her own ability to practice breastfeeding.

We intended to integrate the TPB into breastfeeding intervention programme by focusing on above factors simultaneously: (1) educating mothers with the benefit and importance of breastfeeding (knowledge and attitude); (2) educating and inviting their significant others to involve in the breastfeeding programme, creating a supportive environment (subjective norm); (3) giving breastfeeding individual instruction on correct breastfeeding skill, fostering mothers' breastfeeding skills (perceived breastfeeding control); and (4) giving advice on breastfeeding-related problems solving through telephone counselling, especially advice that prepare employed mothers for work, providing continued support during postpartum period (perceived breastfeeding control).

Therefore, this study aimed to examine the effectiveness of the TPB-based intervention programme that targeted on improving breastfeeding knowledge and positive attitude, enhancing family support (subjective norm), strengthening breastfeeding control, and preparing for working situation in increasing EBF rate during 6 months post partum among Chinese primiparous women.

Methods

Research design and participants

This is a prospective randomised controlled trial conducted in a tertiary hospital, which is a teaching hospital accredited as an 'AAA' tertiary care specialty hospital with an average of 15,000–17,000 new births per annum. The majority mothers served in this hospital were local resident, only a small amount of mothers come from other cities. We assumed the current rate of exclusive breastfeeding was almost

30% at 6 months (Guo et al., 2013), and wanted to increase it to 50%, as recommended by the WHO. To calculate the sample size, an accuracy of 10% and a significance level of 5% were used. It was estimated that a sample size of at least 245 participants would be required, allowing for attrition rate of 20%.

Participants who were admitted to this hospital during October 2013 and January 2014 were recruited consecutively. Chinese primiparous women who met the following criteria were included: (1) physically and mentally capable of communicating, reading and writing in Mandarin; (2) not having illnesses or problems that prohibit breast feeding for both mother and infant; (3) having attended at least one antenatal education class; and (4) accompanied with either a husband or a grandmother who met the following criteria as a significant other: (1) able to communicate and read in Mandarin; (2) having regular contact with the participant; and (3) willing and able to attend the intervention activities.

A permuted block random sampling method was used to assign the participants into the intervention or control group. Given a block size of 4, there were 6 different possible arrangements in a block to assign participants equally to two groups. A random number sequence was generated by computer and was used to choose a particular block, which set the allocation order for the first four participants. The process was then repeated. The participants were, thereby, divided into the intervention and control groups randomly. The random allocation was performed by a researcher who was not involve in intervention and data collection. The participant was also unaware of their group allocation during the study period. As each participant was admitted into a private room, there was little contamination between groups.

Intervention

The intervention group was offered the TPB-based intervention programme by three nurses, in addition to the routine nursing care. In order to ensure the quality and consistency of intervention, they were trained before the study. The TPB-based intervention programme comprised one individual instruction and two group educations at hospital and continued telephone counselling at home during postpartum period. The intervention protocol is summarised in Table 1. Whereas, the control group received only routine support from nurses in ward. The routine care included one antenatal breastfeeding education class, rooming-in, breastfeeding initiation within half an hour after childbirth, lactation consulting support by primary nurses, pamphlets on breastfeeding presented in the ward during their hospitalisation, and regular check-up and education on breastfeeding at 6 weeks post partum, without telephone counselling during follow-up.

Data collection

Ethical approval was granted by the Research Ethics Review Committee of Shanghai First Maternity and Infant Hospital, Shanghai, China. Fig. 1 shows the process of data collection. The eligible participants were approached on the first day after childbirth and informed about the purpose of the study, procedures, confidentiality and anonymity preserved, and potential risks and benefits. Then, written informed consents were obtained. Meanwhile, demographic information was collected, which included mother's age, marital status, education level, family yearly income, mother's working status and residence.

The normal length of stay is 3 days in this hospital, and mothers will come back for a regular check-up at 6 weeks. Data pertaining to breastfeeding practice were collected at 3 days, 6 weeks, 4 months and 6 months post partum. The data were collected either through face-to-face or telephone interview by the researchers, who were unaware of the group allocation. Exclusive breastfeeding is to feed infants with

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