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Original Research - Qualitative

Impact of intervention on breastfeeding outcomes and determinants based on theory of planned behavior

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ARTICLE INFO

Article history:

Received 11 May 2016

Received in revised form 22 August 2016

Accepted 29 September 2016

Keywords:

Exclusive breastfeeding

Knowledge

Attitude

Subjective norm

Behavior control

ABSTRACT

Background: Breastfeeding knowledge, attitude, subjective norm, and perceived control are significant determinants of breastfeeding, according to the theory of planned behavior (TPB). However, evidence concerning the effectiveness of the TPB-based intervention in breastfeeding promotion is sparse. Meanwhile, the changes of these determinants with time have not been examined in previous studies. **Aim:** To investigate the effectiveness of the TPB-based intervention program in improving exclusive breastfeeding, and the interaction of time and intervention on these determinants of breastfeeding.

Methods: 285 primiparous mothers were included, with 157 mothers in the experimental group and 128 mothers in the control group. The experimental group received the TPB-based intervention program delivered during 6 weeks postpartum, while both the experimental and control groups received the standard obstetric care.

Findings: Scores of breastfeeding knowledge, attitude and breastfeeding control increased with time from baseline to 6 weeks postpartum, while breastfeeding subjective norm decreased at 6 weeks both in the experimental and the control groups. Besides, scores of the four determinants were significantly higher in the experimental group than these in the control group at 3 days and 6 weeks, except for breastfeeding control at 6 weeks, which resulted in the higher exclusive breastfeeding rates at 3 days and 6 weeks in the experimental group than the control group.

Discussion and conclusions: The TPB-based intervention was effective in promoting exclusive breastfeeding during 6 weeks postpartum. Future interventions are recommended to adjust intervention strategies with time, and give more focus on providing continued breastfeeding support after discharge.

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Statement of significance

Problem

Exclusive breastfeeding rates are low in many countries, and interventions are needed to promote exclusive breastfeeding.

What is already known

The theory of planned behavior (TPB) has been used to predict breastfeeding behavior. According to TPB,

breastfeeding attitude, subjective norm, breastfeeding control are significant determinants of breastfeeding behavior.

What this paper adds

This paper provides the evidence of the feasibility and effectiveness of the TPB-based intervention during the first 6 weeks postpartum, and the changes of breastfeeding knowledge, attitude, subjective norm, and behavior control with time.

1. Introduction

Breastfeeding is a normal way of providing infants with the nutrients they need for healthy growth and development.¹ It serves as the cornerstone of infants' early and long-term health.²

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Suboptimal breastfeeding is responsible for 3.1 million child deaths in the first 2 years of children's life annually.³ Breastfeeding also protects children from diseases in their later life, such as obesity and diabetes.^{4,5} Besides, it promotes the cognitive and behavioral development, and higher educational achievements are observed among children who have ever been breastfed.⁶

Despite the established benefits, few countries have adhered to the recommendation of breastfeeding exclusively for the infants' first six months.^{1,7} The initial rate of breastfeeding within one hour is 44%, and 38% of infants under 6 months of age are continued to be exclusively breastfed in the world.² The prevalence of exclusive breastfeeding is also upsetting in China. A community-based, cross-sectional survey of 2354 children in central and western China reports that only 28.7% infant under 6 months have ever been exclusively breastfed.⁸ A recent local study shows that rate of exclusive breastfeeding is only 6.8% at 6 months,⁹ which is far short of the goal of increasing the rate of exclusive breastfeeding in the first 6 months up to at least 50% by 2025.^{10,11}

In response to the low breastfeeding prevalence, the determinants of breastfeeding must be identified. Previous studies have categorized the factors related to breastfeeding into sociodemographic (i.e., age, marital status, social support), biomedical (i.e., nipple pain, insufficient milk), and psychosocial factors (i.e., breastfeeding attitude, self-efficacy).^{12,13} However, some determinants are likely to be modifiable, while others are not. Studies suggest that breastfeeding knowledge and education, attitude toward breastfeeding,¹³ breastfeeding control (self-efficacy), and social support are positively related to breastfeeding practice,^{14,15} and can be changed and improved through intervention.

Based on the evidence of previous studies, breastfeeding promotion intervention come to focus on these modifiable factors of breastfeeding. The theory of planned behavior (TPB) is a model that focuses on the cognitive factors related to behavior,¹⁶ and has also been used to predict breastfeeding outcomes.^{17,18} According to the TPB, attitude, subjective norm, and perceived control are key determinants of behavior. Breastfeeding attitude is related to the knowledge of the importance and benefit of exclusive breastfeeding. The better awareness of the importance of breastfeeding, the more positive attitude toward breastfeeding. Subjective norm is an abstract concept that refers to the subjective perception on the recognition and support of breastfeeding from significant others. In Chinese culture, mother's decision on breastfeeding is often pressured by significant others, such as husband, grandmother. Their support or opposition makes a difference on mother's breastfeeding outcome. Thus, subjective norm is also a key component for a successful breastfeeding. Breastfeeding control refers to mother's confidence and ability to practice breastfeeding. Women with higher self-efficacy or breastfeeding control are more likely to practice breastfeeding. The TPB assumes that breastfeeding attitude, subjective norm, breastfeeding control are significant predictors of breastfeeding intention, as well as breastfeeding practice.¹⁹

As the TPB can be used to predict breastfeeding outcomes, studies indicate that TPB may also be an useful theoretical framework to guide intervention program.^{18,20} Therefore, intervention that focuses on increasing breastfeeding knowledge and attitude, subjective norm, and breastfeeding control may be effective in promoting breastfeeding.²¹ However, the evidence concerning the effectiveness of the TPB-based intervention program in promoting breastfeeding is sparse. Meanwhile, how these determinants change with time has not been examined in previous study, the knowledge of which will help us tailor our intervention in future clinical practice.

Therefore, the current study aims to examine the effectiveness of the TPB-based intervention strategies in the promotion of exclusive breastfeeding, as well as the interaction of intervention

and time on breastfeeding knowledge, attitude, subjective norm, and perceived control of breastfeeding behavior during the first 6 weeks postpartum.

2. Participants, ethics and methods

2.1. Setting and participants

The study was conducted in the obstetric unit of Shanghai First Maternity and Infant Hospital, Tongji University from October 2013 to June 2014, which is a teaching hospital accredited as an "AAA" tertiary care specialty hospital. This hospital has a high birth rate, with an average of 15–18 thousand new births annually. More than 85% of the pregnant women who give birth in the hospital are local residences, and the other 10–15% come from other cities. Postnatal obstetric units are staffed primarily with obstetric nurses. Mothers and their infants are admitted to postnatal obstetric unit within two hours after delivery, if there are not any serious complications for them. The average length of hospital stay is 3 days, regardless of vaginal delivery or caesarean. After discharge, mothers and their babies will return to hospital for a routine check-up at 6 weeks postpartum.

When participants were admitted to obstetric unit after delivery, mothers were screened for eligibility by an independent researcher. Eligible participants were primiparous mothers who were willing to participate the research, accompanied with significant others (i.e., husband or grandmother), able to read, write, and communicate in Chinese, without any serious obstetric complications or other medical illnesses that permanently or temporarily inhibit breastfeeding, such as postpartum hemorrhage, acute phase hepatitis, HIV-positive, or psychiatric illness. In addition, the criteria for their infants included: gestational age ≥ 37 weeks, birth weight ≥ 2500 g, 5-min Apgar score ≥ 8 , and without any conditions that prohibit breastfeeding (i.e., cleft palate) or illnesses that need to be transferred to neonatal intensive care unit. A permuted block random sampling method was employed to randomly allocate participants into the experimental and control groups.

2.2. Ethical consideration

This research was approved by the Research Ethics Review Committee of Shanghai First Maternity and Infant Hospital, Shanghai, China. Participants were informed about the purpose and content of intervention, and the risk and benefit of participation. Meanwhile, they were assured of the confidentiality and anonymity of their clinical data. Written informed consents were assigned by all participants.

2.3. Intervention

Participants in the intervention group were provided standard obstetric care and the TPB-based intervention program, while participants in the control group only received standard obstetric care. Standard obstetric care were provided by ordinary obstetric nurses, which included once prenatal breastfeeding class, rooming-in, breastfeeding initiation within half an hour after delivery, lactation consultant support by primary nurse, and the pamphlets on breastfeeding presented in the ward during their stay.

The objective of the TPB-based intervention program was to increase exclusive breastfeeding rate by increasing mothers' knowledge and attitude on breastfeeding, subjective norm and breastfeeding control, based on the TPB. Thus, combined strategies were implemented in this program, including individual instruction, group activity and telephone counseling. The content of intervention, such as breastfeeding benefits, breastfeeding

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