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Development and measurement properties of the Chinese breastfeeding self-regulation questionnaire

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ABSTRACT

Background: although new mothers are aware of the benefits of breastfeeding, many of them stop breastfeeding early in the postpartum period. Maternal psychosocial factors have been shown to contribute to early breastfeeding cessation. According to Self-Determination Theory (SDT) maternal self-determination is an indispensable factor in studying motivation to breastfeed. There are no validated instruments to assess maternal breastfeeding motivation and self-determination.
Objective: our aim was to develop and assess the psychometric properties of the Breastfeeding Self -Regulation Questionnaire (BSRQ) for Chinese pregnant women in Hong Kong.
Method: we reviewed the literature and devised items for a preliminary version of the questionnaire. Thirty-five context-specific items in English were generated. We translated the items into Chinese and then back translated them into English following established translation procedures. We employed exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to assess the structure of the questionnaire. Predictive validity was measured by assessing the relationship between the BRSQ score and actual duration of breastfeeding.
Findings: we recruited 591 participants from three publicly funded antenatal clinics. Of the 35 items in the preliminary BSRQ, 22 were retained by EFA. CFA revealed that there were 5 factors including intrinsic, identified, integrated, introjected and external regulation. The goodness of fit of the CFA model was adequate. The Cronbach's alpha of the BSRQ was 0.86. For every one point increase in the BSRQ score, participants had 15% higher odds of any breastfeeding (OR=1.15, 95%CI 1.07–1.23) and 9% higher odds of exclusive breastfeeding (OR=1.09, 95%CI 1.02–1.17) at 6 weeks postpartum.
Conclusion: the Chinese version of the BSRQ was a valid and reliable tool to measure maternal self-determination towards breastfeeding.

Introduction

Breastmilk is nutritious and beneficial for a infant (World Health Organization, 2003; American Academy of Pediatrics, 2012). The World Health Organization (2003) recommends babies should be exclusively breastfed for at least six months, and should continue breastfeeding up to two years of age and beyond. Many new mothers intend to breastfeed and actually initiate breastfeeding but few do so exclusively for 6 months, and fewer continue breastfeeding up to the recommended age of 24 months (Semenic et al., 2008; Scott et al., 2006; Clifford et al., 2006; Henderson et al., 2003; Tarrant et al., 2010). Therefore, intention seems to predict initiation of breastfeeding rather than duration. Similarly, over the past two decades in Hong Kong, breastfeeding initiation rates have steadily increased from around 30% to above 88% (UNICEF Baby Friendly Hospital Initiative Hong Kong Association, 2016). However, overall breast-feeding dura-

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tion remains short and rates of exclusive breast-feeding are low (Department of Health, 2015). A recent study of breastfeeding practices showed that breastfeeding rates decline substantially after hospital discharge, with less than one-half of all breastfeeding mothers continuing to breastfeed for at least 3 months (Tarrant et al., 2015). In-hospital artificial milk supplementation rates of healthy, breastfeeding babies are above 50% (Tarrant et al., 2015) and adequate community support for breastfeeding mothers is lacking (Tarrant et al., 2014).

A number of factors have been shown to affect breastfeeding continuation in new mothers, both in Hong Kong and in other developed countries. Sociodemographic characteristics such as higher maternal education and occupational status are associated with higher rates of breastfeeding initiation and a longer breastfeeding duration (Kelly and Watt, 2005; de Jager et al., 2013). Baby-friendly hospital practices, such as early initiation of breastfeeding, avoiding non-medically indicated artificial milk supplementation, rooming in and breastfeeding on demand have been shown to be consistently associated with a longer breastfeeding duration (Tarrant et al., 2016; Tarrant et al., 2011; DiGirolamo et al., 2008; Brodribb et al., 2013). Early return to postpartum employment and shorter maternity leave negatively affects both breastfeeding initiation and duration (Bai et al., 2015; Chuang et al., 2010; Cooklin et al., 2008). Moreover, the provision of breast milk expression breaks and breastfeeding friendly facilities in the workplace enhance mothers' ability to continue breastfeeding when they return to work (Clifford et al., 2006; Chen et al., 2006). Breastfeeding education and support are also important factors affecting breastfeeding continuation. Women who are knowledgeable about infant feeding cues or feeding on demand are less likely to supplement with artificial milk (Tarrant et al., 2014). Support from family members and significant others, especially the spouse, provide both emotional and instrumental support that allows new mothers to continue breastfeeding (Bai et al., 2016; Clifford and McIntyre, 2008; Sherriff et al., 2014). Practical advice on breastfeeding management from a mother's significant others is associated with continued breastfeeding and ability to overcome breastfeeding problems (Hauck et al., 2002; Dykes and Williams, 1999; Tarrant et al., 2004). The sociocultural environment can also affect breastfeeding. Breastfeeding and baby-friendly communities that provide breastfeeding and child-care facilities and support a mother's right to breastfeed anywhere enhance womens' ability to continue breastfeeding (Tarrant et al., 2016; Tarrant et al., 2011; Brodribb et al., 2013; Gregg et al., 2015; Lilleston et al., 2015; Fox et al., 2015).

Studies from health psychology that examine the psychosocial determinants of health behaviors can be of use to help investigate the influence of these underlying factors on breastfeeding. Among new mothers who intend to breastfeed, women who are more confident towards breastfeeding tend to have a longer duration of breastfeeding (Ku and Chow, 2010; Avery et al., 2009; Scott et al., 2003). Antenatal breastfeeding education could facilitate maternal competence and confidence in making achievable breastfeeding goals (Artieta-Pinedo et al., 2013; Neifert and Bunik, 2013). In contrast, mothers who are poorly informed about breastfeeding problems during the antenatal periods are more likely to supplement with infant artificial milk in the early postpartum because they perceive that they are not competent in breastfeeding (Tarrant et al., 2014). Antenatal mothers in a peer counseling program indicated that observing breastfeeding mother-infant dyads boosted their confidence in breastfeeding their own children (Meier et al., 2007). Mothers who overcome breastfeeding problems in the early postpartum, including poor latch, perception of insufficient milk, mastitis or sore nipples are more confident in their ability to breastfeed are able to avoid supplementing with infant artificial milk (Tarrant et al., 2010; Blyth et al., 2002; Colin and Scott, 2002; Amir and Cwikel, 2005). Why some new mothers are able to overcome initial difficulties to continue breastfeeding, while others give up early in the postpartum period despite of seeking breastfeeding support, is unclear. Therefore, a deeper understanding of the role played by these psychosocial factors can be used to subsequently increase the duration of breastfeeding.

Motivational analysis of behavior (Deci and Ryan, 1985) states that an individual has a psychological need for autonomy, which is expressed as an individual's need to act or behave with choice and freedom and the need to assimilate such behavior as an innate component of self in respect to the individual (Angyal et al., 1965; Ryan and Connell, 1989; Deci, 1980). A person is said to be self-determined when their need for autonomy is satisfied (Ryan and Deci, 2000). Autonomy is the core of self-determination theory (SDT) (Deci and Ryan, 1985). In the context of SDT, based on the degree of satisfaction in the need for autonomy, self-determination is described as a continuum of self-regulation. The continuum of self-regulation includes intrinsic regulation, identified regulation, integrated regulation, introjected regulation, external regulation and amotivated regulation (Ryan and Deci, 2000). Intrinsic regulation states that it is inherently enjoyable to take part in a particular behavior. Identified regulation states that a behavioral regulation, although it may lack enjoyment, is personally important to an individual (Ryan and Deci, 2000). Integrated regulation states that an individual completely assimilates the identified regulation into his/her authentic core belief (Ryan and Connell, 1989). Individuals with introjected regulation would feel shame or guilt if they did not engage in a behavior (Ryan and Deci, 2000). External regulation states that a person engages in behavioral regulation to get rewards or avoid punishment (Ryan and Connell, 1989). In amotivated regulation individuals ignore their need for autonomy. Amotivated individuals have no intention to engage in a behavior or they feel incompetent in engaging in a behavior (Deci and Ryan, 1985). Intrinsic regulation, integrated regulation and identified regulation are related to autonomous motivation. Introjected regulation and external regulations belong to controlled motivation. Compared to autonomously motivated people, those with controlled motivation are low in satisfaction associated with autonomy (Deci and Ryan, 1985; Ryan and Deci, 2000). SDT states that people can internalise behavior that is under controlled motivation into a more autonomously motivated behavior when their needs for autonomy can be satisfied (Ryan and Deci, 2000).

The continuum of self-regulation is operationalised by the Self-Regulation Questionnaire (SRQ) (Ryan and Connell, 1989). In a study of internalization of religious beliefs, Ryan and co-authors (Ryan et al., 1993) found that followers' autonomous motivation is related to better psychological health and well-being. The roles played by self-determination and internalization have been confirmed in studies of sports injury prevention and occupational injury prevention (Chan and Hagger, 2012a,b). All these studies show that SRQ is a reliable and valid tool in reflecting the continuum of self-regulations.

Under the assumption of SDT, pregnant women who are self-endorsed in their beliefs about breastfeeding and volitional in choosing breastfeeding may accommodate breastfeeding more flexibly and continue despite discouragement, stress or difficulties. SDT posits that autonomy support from significant others plays a vital role in satisfying an individual's need for autonomy (Deci et al., 1996). When applied to breastfeeding, non-persuasive verbal support from significant others may promote autonomy in a new mother who wants to breastfeed for a longer duration. An emphasis on the need for autonomy is postulated in SDT because when the need for autonomy is thwarted, people feel anxious and incompetent in handling a task continually and will lose interest in doing the task if there are barriers (Deci and Ryan, 1985). This is in line with the observation that in spite of difficulties, maternal commitment to breastfeed is facilitated by supportive partners and significant others (Tarrant et al., 2004).

Maternal self-determination towards breastfeeding is modifiable because it could be enhanced by a breastfeeding supportive climate, such as encouragement and positive feedbacks by mothers' significant others. When mothers' breastfeeding behavior becomes autonomously self-regulated, the duration of breastfeeding can be extended. Up to

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