A Causal Model of Breastfeeding Duration among Working Muslim Mothers in Central Java Province, Indonesia

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ABSTRACT

This descriptive cross-sectional study aimed to develop and test a causal model of breastfeeding duration among working Muslim mothers in Central Java Province, Indonesia. Eight independent variables were tested including breastfeeding knowledge, family support, workplace support, attitude toward breastfeeding, breastfeeding problems, sufficient milk supply, breastfeeding initiation, intention to exclusive breastfeeding, and whether they had an effect on the dependent variables and breastfeeding duration. Two hundred and forty working Muslim mothers were purposively sampling from 16 districts in Semarang City, Central Java Province, Indonesia. Data were collected using a set of questionnaires.

The instruments were content validated by a panel of five experts in Indonesia and Thailand and yielded the Content Validity Index ranged between .85 and 1.00. They were back translated from English into the Indonesian language. The reliability of the research instruments were evaluated and yielded an acceptable level of reliability coefficients (greater than .85). Data were analyzed using path analysis. The results revealed that:

1) Some of the goodness of fit measures of the hypothesized model were not met.

2) The goodness of fit measures of the modified model were met.

3) The modified model revealed that the all eight independent variables significantly accounted for 75% of the variance in breastfeeding duration (R^2 = .75). Breastfeeding knowledge, family support, workplace support, attitude toward breastfeeding, sufficient milk supply, and intention to exclusive breastfeeding affected directly and positively on breastfeeding duration (β = .26, p < .001; β = .13, p < .001;

β = .07, p < .05; β = .49, p < .001; β = .11, p < .01; β = .23, p < .001, respectively). In contrast, breastfeeding problems affected breastfeeding duration directly and negatively (β = -.11, p < .01) and breastfeeding initiation did not have a direct and significant affect on breastfeeding duration (β = -.06, p > .05, respectively). Breastfeeding knowledge and intention to exclusive breastfeeding had a direct and negative effect on breastfeeding initiation directly (β = -.17, p < .05; β = -.22, p < .01). Family support did not have significantly affect on breastfeeding initiation directly (β = -.06, p > .05, respectively). Breastfeeding knowledge and attitude toward breastfeeding affected intention to exclusive breastfeeding directly and positively (β = .42; β = .22, all p < .001, respectively). Breastfeeding knowledge, family support, and intention to exclusive breastfeeding did not significantly have an indirect effect on breastfeeding duration through breastfeeding initiation (β = -.01, p > .05; β = .00, p > .05; β = .01, p > .05, respectively). Breastfeeding knowledge and attitude toward breastfeeding affected breastfeeding initiation indirectly and negatively through intention to exclusive breastfeeding (β = -.01, p < .01; β = -.01, p < .01). Breastfeeding knowledge and attitude toward breastfeeding affected breastfeeding duration indirectly and positively through intention to exclusive breastfeeding (β = .10, p < .001; β = .05, p < .01).

Nurses can use these study findings to develop a program to enhance breastfeeding duration by integrate all of the significant variables and focus on intention to exclusive breastfeeding, breastfeeding knowledge, and attitude toward breastfeeding. An integrated nursing program involve midwives, community leader, and religious leader is proposed to increase intention to exclusive breastfeeding and extend breastfeeding duration. The program will be near perfection when it uses a longitudinal study.

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CHAPTER 1

INTRODUCTION

This chapter describes background and significance of the problem, objectives of research, research questions, conceptual framework, hypotheses, definition of terms, the scope of the study, and the significance of the study.

Background and Significance of the Problem

The number of females employed increases every year. The female employ ment rate in Indonesia was 32.7 percent, 38.8 percent, 40 percent, and 52 percent in the years 1980, 1990, 1997, and 2012, respectively). Becoming a working mother causes several effects both to the mother and the infant. Among them, child nutrition status was the most affected because the mother was the primary caregiver for her child, particularly in developing countries (Roshita, Schubert, & Whittaker, 2011).

Evidence showed that maternal employment was the major barrier to exclusive breastfeeding (EBF) (Agunbiade & Ogunleye, 2012; Al-Sahab, Lanes, Feldman, & Tamim, 2010; Berlian, 2010; Dennis, 2006; Ladomenou, Kafatos, & Galanakis, 2007; L. Li, Zhang, Scott, & Binns, 2004). Lactating working mothers experienced multirole conflicts, had special needs related to breast milk pumping during work, balanced job duties and breastfeeding process, suffered from psychological distress, overcame breastfeeding problems, and needed support from family and workplace (Reifsnider, Gill, Villarreal, & Tinkle, 2003; Rojjanasrirat, 2004; Stewart-Knox, Gardiner, & Wright, 2003). Working outside the home increases the possibility of short duration of EBF as found in China (Xu et al., 2007), Singapore (Ong, Yap, Li, & Choo, 2005),

Vietnam (Dearden et al., 2002), and Kenya (Lakati, Binns, & Stevenson, 2002). Managing the influencing factors may increase EBF duration among working mothers.

In the past, most of Indonesian children below two years old were breastfed (95 percent) and the mean of breastfeeding duration was relatively long (22.3 months) (Statistics Indonesia, 2007). However, EBF is uncommon in Indonesia nowdays. The EBF rates were 47 percent, 23.9 percent, 13.9 percent, 17 percent, and 27.1 percent in 1994, 1997, 2002 - 2003, 2007, and 2012, respectively (Statistics Indonesia, 1994, 1997, 2002 - 2003, 2007, 2012a). This circumstance was far from the target of Indonesia Healthy People, 2010, in which 80 percent of Indonesian mothers should perform EBF for up to six months. Previous studies (Rahmah, 2011; Riyadi, 2010), have highlighted the main barriers to EBF among Indonesian working mothers; lack of breastfeeding management knowledge, lack of employer support, and psychological factors. These two studies provide an empirical foundation regarding factors influencing short EBF duration among Indonesian working mothers.

Previous studies in breastfeeding focused on the breastfeeding duration, but there was as lack of EBF duration studies, especially among working mothers in developing countries. Due to the magnitude of the effect of breastfeeding on maternal and child health, understanding factors influencing breastfeeding are needed to help working mothers maintain breastfeeding up to six months as recommended by World Health Organization [WHO] (2012). In this study, eight modifiable influencing factors on the breastfeeding duration were selected because all of these factors could be corrected, improved, or changed by working mothers with support from nurses. Lactating working mothers had specific needs which were different from general lactating mothers. To find the influencing factors of exclusive breastfeeding among Indonesian working Muslim mothers up to six months, this study selected eight

variables which empirically correlated or predicted breastfeeding duration in Indonesia (Afiyanti & Juliastuti, 2012; Rejeki, 2008; Sumini, 2011; Wicitra, 2009) or other Muslim populations (R. M. Amin, Said, Sutan, Shah, Darus, & Shamsuddin, 2011; Homer, Sheehan, & Cooke, 2002; S. Khatun, 2010). The study variables included breastfeeding knowledge (Wicitra, 2009), family support (Biswas, 2010), workplace support (R. M. Amin, et al., 2011), attitude toward breastfeeding (S. Khatun, 2010), breastfeeding problems (Rejeki, 2008), sufficient milk supply (Afiyanti & Juliastuti, 2012), breastfeeding initiation (Sumini, 2011), and intention to exclusive breastfeeding (Homer, et al., 2002).

There is no doubt, breastfeeding knowledge influences breastfeeding initiation, intention to exclusive breastfeeding, and breastfeeding duration among working mothers. A study among Indonesian mothers revealed that mothers who had high levels of breastfeeding knowledge were more likely to initiate breastfeeding within the first hour after delivery (Hidayat & Dewantiningrum, 2012) and breastfeed exclusively (Wicitra, 2009). Greater breastfeeding knowledge influenced stronger intention to breastfeeding among Mississippi mothers (Mitra, Khoury, Hinton, & Carothers, 2004) and longer breastfeeding duration among American mothers (Chezem, Friesen, & Boettcher, 2006).

Similar to other breastfeeding mothers, lactating working mothers need family support to continue breastfeeding their infants exclusively after returning to work (Wicitra, 2009). A study in Bangladesh found that there was a significant correlation between family support and exclusive breastfeeding duration (Biswas, 2010). Indonesian working mothers who received breastfeeding support from their husband breastfed exclusively longer than mothers who did not receive the fathers' support (Wicitra, 2009). Support from family members also correlated with intention to

breastfeeding among Syrian and Lebanese mothers (Al-Akour, Khassawneh, Khader, Ababneh, & Haddad, 2010) and American mothers (Humphreys, Thompson, & Miner, 2002) and breastfeeding initiation among Australian mothers (L. Li et al., 2004).

Breastfeeding support from coworkers (Johnston & Esposito, 2007) and employers (Brown, Poag, & Kasprzycki, 2001; Clifford & McIntyre, 2008; Johnston & Esposito, 2007; Kosmala-Anderson & Wallace, 2006) also significantly influenced breastfeeding duration for lactating working mothers. Workplace breastfeeding support was a significant predictor of breastfeeding duration among working mothers in Malaysia (R. M. Amin, et al., 2011). Evidence showed that the availability of breast milk pumping facilities in the office, lower workload, use of breast pumping breaks, and support from colleagues and employers correlated with breastfeeding duration among working mothers in Taiwan (Tsai, 2013).

Evidence shows that attitude toward breastfeeding was a predictor of intention to breastfeeding (Dodgson, Henly, Duckett, & Tarrant, 2003; Duckett et al., 1998; Trzcinski & Holst, 2007). The most significant factor influencing intention to exclusive breastfeeding among Bangladeshi mothers was attitude toward EBF (S. Khatun, 2010). Another Indonesian study reported that attitude toward EBF significantly predicted the EBF duration (Nasution, 2013). Breastfeeding has been influenced by religious beliefs and philosophy (Foo, Quek, Ng, Lim, & Deurenberg-Yap, 2005; Greta, Sevenhuysen, Gross, & Sastroamidjojo, 2002; Susilawaty, Sitompul, Dalimunthe, & Roslina, 2007; Tan, 2009). The literature review showed that mothers' religiosity influenced breastfeeding duration (Foo et al., 2005). A study by Azaiza and Palti (1997) revealed that mothers' religiosity was a significant predictor of breastfeeding duration among Muslim mothers in Israel.

Breastfeeding problems at a postpartum period influenced mother's intention to give supplementary food before the infant's age was six months (Lee, 2003). Pain and discomfort during breastfeeding were significantly influenced EBF duration (Lee, 2003; Wojcicki, et al., 2010). Similarly, Indonesian working mothers who experienced breastfeeding problems had shorter breastfeeding duration (Rejeki, 2008). Breastfeeding problems among Indonesian working mothers were sore nipples, embarrassment of breastfeeding in public area, engorgement, mastitis, and breast milk seeping into mothers' clothes (Rejeki, 2008).

Perceived sufficient milk supply was an important factor of long breastfeeding duration. Hill and Hummenick (1996) found that higher sufficient milk supply perception was associated with the longer breastfeeding duration. In contrast, insufficient milk supply is well known as a predictor of short breastfeeding duration (Chatman et al., 2004; DiFrisco et al., 2011; Gatti, 2008; Gill, 2009; Lewallen et al., 2006) and the major cause of giving supplementary food for infants below six months among Jordanian mothers (Khassawneh, Khader, Amarin, & Alkafajei, 2006) and Indonesian mothers (Afiyanti & Juliastuti, 2012).

Evidence shows that intention to exclusive breastfeeding significantly influenced EBF duration among American mothers (Bai, et al., 2011) and Turkish mothers (Camurdan et al., 2008) and also breastfeeding duration among working mothers in the United States (Dodgson et al., 1998) and Hong Kong (Ducket et al., 2003). Intention to exclusive breastfeeding showed how strong a mother was motivated to provide breast milk only for her infant from delivery up to six months of age (Bai, et al., 2011). Breastfeeding initiation was also a mediating factor of EBF duration of mothers in China (Qiu, Zhao, Binns, Lee, & Xie, 2009). Mothers who

initiated breastfeeding the first day after delivery were more likely to breastfeed exclusively in China (Qiu et al., 2009) and in Indonesia (Sumini, 2011) and also have longer breastfeeding duration among working mothers in the United States (Sattari, Levine, Bertram, & Serwint, 2010).

Studies about breastfeeding have been extensively published in literature. Understanding the influencing factors of breastfeeding practice among Muslim mothers would help nurses to provide appropriate nursing care to enhance breastfeeding initiation, intention to exclusive breastfeeding, and breastfeeding duration among Muslim mothers. There were several studies that examined the influencing factors of breastfeeding duration among Muslim mothers. However, these previous studies were fragmented, a correlation or prediction study, not comprehensive, with non-modifiable variables. Besides, there were three previous studies that tested the causal model of breastfeeding duration among mothers in the United States (Ducket et al., 1998; Wambach, 1998) and Hong Kong (Dodgson et al., 2003).

The first study, Ducket et al. (1998) examined a causal model of breastfeeding duration among Minneapolis mothers. This study evaluated the causal model among three first time mother groups: homemaker mothers (n = 180), work less time mothers (n = 110), and work more time mothers (n = 312). This study used TpB, empirical evidence, preliminary data set analysis, and practical consideration to guide the researchers depicted study models. The predictive variables in this study were intention to breastfeeding, attitude toward breastfeeding, attitude toward bottle-feeding, beliefs about outcomes of breastfeeding, beliefs about outcomes of bottle-feeding, subjective norm, referent beliefs, control beliefs, perceived control, perceived insufficient milk supply, level of education, and breastfeeding knowledge. The

dependent variable was breastfeeding duration. The results showed that all of the parameter estimates were significants except for two (e.g. the path from subjective norm to attitude toward breastfeeding in the employed less group, and the path from breastfeeding knowledge to attitude toward bottle-feeding in the homemaker group).

The second study, Dodgson et al. (2003) replicated this study among Hong Kong first time mothers (n = 239). This study examined the strict Theory of Planned Behavior model, the Modified Minnesota Theory of Planned Behavior for women employed more than 20 hours per week model, and the Theory of Planned Behavior perceived control mediated model. The predictive e variables in this study were beliefs about outcomes of formula, beliefs about outcomes of breastfeeding, referent beliefs, control beliefs, attitude toward formula feeding, attitude toward breastfeeding, subjective norm, perceived control, intention to breastfeeding, antecedent index (e.g. attendance at childbirth class(es), attendance at breastfeeding class(es), maternal education, NSVD, rooming-in, plan to exclusively breastfeed), breastfeeding difficulty index, and proximity index (e.g. sore nipples, breast infection, baby's illness, fatigue). The dependent variable was breastfeeding duration. This study revealed that the Modified Minnesota Theory of Planned Behavior for women employed more than 20 hours per week model, and the Theory of Planned Behavior perceived mediated model had an adequate fit. All predictive variables in the TpB perceived control mediated model predicted breastfeeding duration, whereas most of predictive variables in the TpB for breastfeeding employed women model predicted breastfeeding duration.

Another causal model study related to breastfeeding duration was conducted by Wambach (1998). This study aimed to evaluate the predictors of intention to breastfeeding and breastfeeding outcome among Kansas mothers. This study used the TPB as the research framework. This study examined the strict TpB model and found that attitude toward breastfeeding and perceived breastfeeding control predicted the intention to breastfeeding (Wambach, 1998). However, subjective norm could not predict intention to breastfeeding. Intention to breastfeeding predicted breastfeeding duration significantly (Wambach, 1998).

These three previous studies regarding causal models of breastfeeding duration were conducted in non-Muslim cultural context and its cross cultural relevance to Muslim population had not been assessed. Therefore, the findings of the previous models may not be applicable to Muslim mothers with whom the beliefs and cultures of the previous studies population are incompatible. Thus, a study to investigate a causal model of factors influencing breastfeeding duration among working Muslim mothers is needed. Theory and previous studies results were used to select the predicting factors in this study.

Objectives

The objectives of this study are to develop and test a model of breastfeeding duration among working Muslim mothers in Indonesia.

Research Questions

The research questions in this study are as follows:

1. Does the initial model fit the data?
2. Do breastfeeding knowledge, family support, and intention to exclusive breastfeeding have direct and positive effects on breastfeeding initiation?

3. Do breastfeeding knowledge, family support, and attitude toward breastfeeding have direct and positive effects on intention to exclusive breastfeeding?
4. Do breastfeeding knowledge, family support, workplace support, attitude toward breastfeeding, sufficient milk supply, and Intention to exclusive breastfeeding have direct and positive effects breastfeeding duration?
5. Do breastfeeding problems and breastfeeding initiation have direct and negative effects on breastfeeding duration?
6. Does breastfeeding initiation mediate the relationships between breastfeeding knowledge and breastfeeding duration, family support and breastfeeding duration, and intention to exclusive breastfeeding and breastfeeding duration?
7. Does intention to exclusive breastfeeding mediate the relationships between breastfeeding knowledge and breastfeeding initiation, family support and breastfeeding initiation, and attitude toward breastfeeding and breastfeeding initiation?
8. Does intention to exclusive breastfeeding mediate the relationships between breastfeeding knowledge and breastfeeding duration, family support and breastfeeding duration, and attitude toward breastfeeding and breastfeeding duration?

Conceptual Framework

An explanatory model of breastfeeding duration of working Muslim mothers was developed and tested in this study. There were nine components of the model carefully selected from a theory and empirical studies. This study included four concepts from the Theory of Planned Behavior (TpB) and five concepts from empirical evidence. These nine concepts were synthesized to develop the proposed causal model

including breastfeeding knowledge, family support, workplace support, attitude toward breastfeeding, breastfeeding problems, sufficient milk supply, breastfeeding initiation, intention to exclusive breastfeeding, and breastfeeding duration. The details of each component were as follows.

Theory of Planned Behavior

The Theory of Planned Behavior (Ajzen, 1991) was selected to be used in this investigation. This theory is famous in health-related behavior studies and is widely used as a conceptual framework in human behavior prediction studies (Ajzen, 1991). The Theory of Planned Behavior was a modification of the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 2010). The TRA hypothesized predictive factors of behavior are attitude toward behavior and subjective norm (Fishbein & Ajzen, 2010).

The TpB adds perceived behavioral control as another predictive factor of intention to perform a behavior (Ajzen, 1991). Both the TRA and the TpB assume that intention was the central factor of a person's behavior (Ajzen, 1991). Intention showed an individual motivational factor that forced someone to perform a specific behavior in a specific context. Intention represented of how much someone seriously wanted to perform a behavior and how much of the struggle was undertaken in order to accomplish the given behavior (Ajzen, 1991). As a general rule of human beings, the stronger the intention to perform a behavior, the more likely should be its success.

The Theory of Planned Behavior has three conceptually independent predictors of intention (Ajzen, 1991). The first predictor was the attitude toward behavior which refers to the individual perception regarding behavior and evaluation of behavior outcome (Ajzen, 1991). Individual might has a favorable or unfavorable evaluation of

a specific behavior. The second predictor was a subjective norm which refers to the perceived of expectation from significant others to carry out or not to carry out the behavior (Ajzen, 1991). Subjective norm also includes individual enthusiasm to fulfill the significant others reference regarding a specific behavior. The third predictor of intention was the degree of perceived behavioral control which refers to the individual perception regarding the given behavior was easy or hard to be accomplished (Ajzen, 1991). Past experience influences individual perception of how to overcome the possibility of barriers for achieving the desired behavior (Ajzen, 1991). The person achieves behavior control when there ares no constraints to perform behavior and the person perceives that she/he has an adequate ability to overcome the behavior barriers. The person could use all opportunities, skills, and resources which are needed to perform behavior.

In order to use the TpB, the researcher has to define the behavior clearly. The interest behavior needs to be declared in terms of target, action, context, and time (Francis et al., 2004). Several previous studies used the The TpB to find the predictors of breastfeeding among Minneapolis mothers (Duckett et al., 1998), breastfeeding duration among Hong Kong mothers (Dodgson et al., 2003), breastfeeding outcome among Kansas mothers (Wambach, 1998), and breastfeeding behavior among adolescent Thai mothers (Ratananugool, 2001). The previous studies used the term breastfeeding duration, breastfeeding outcome, breastfeeding, and breastfeeding behavior interchangeably as the interest behavior variable in their study. In this study, breastfeeding duration was used as the term of proposed measured behavior.

The combination of attitude toward behavior, subjective norm, and perceived behavioral control predispose individual intention to perform a behavior. In this theory, the more favorable the attitude, the higher subjective norm, and the greater the perceived behavioral control will produce the stronger an individual's intention to carry out the behavior. Ajzen (1991) suggested testing the prediction ability of attitude, subjective norm, and perceived behavioral control to intention in several behaviors, different situations, across cultures, and varying individual characteristics. According to Ajzen (1991), there are some individual characteristics that are the antecedent of intention's predictors, such as education, age, gender, religion, race, income, culture, and knowledge.

In this study, the researcher took four variables from the Theory of Planned Behavior and modified them from "knowledge" to "breastfeeding knowledge," "attitude toward behavior" to "attitude toward breastfeeding," "intention" to "intention to exclusive breastfeeding," and "behavior" to "breastfeeding duration." The rationale for this action is path analysis requiring theoretical or empirical evidence in selecting the predictive variables (Munro, 2001; Tabachnik & Fidell, 2007).

The researcher only selected the study variables which were well supported by the theoretical and empirical evidence and also fit with the Indonesia context. The researcher did not select subjective norm and perceived behavioral control due to the lack of supporting evidence. Based on previous study results, the subjective norm did not significantly influence intention to exclusive breastfeeding among Muslim mothers (S. Khatun, 2010). Furthermore, the researcher did not find empirical evidence that supported the perceived behavioral control as a predictive factor of intention to

exclusive breastfeeding or breastfeeding duration in Muslim mothers. The following details included relationships among the study variables based on the literature review.

Breastfeeding Knowledge

The Theory of Planned Behavior conceptualized the antecedents of attitude toward breastfeeding, subjective norm, and perceived behavioral control (Ajzen, 1991). The only modifiable antecedent in the Theory of Planned Behavior is knowledge. This study includes breastfeeding knowledge as one of the study variables because several pieces of evidence supported that breastfeeding knowledge predicted intention to breastfeeding, initiation, and duration.

Several previous studies showed that breastfeeding knowledge was a major predictor of intention to exclusive breastfeeding, initiation, and duration. Breastfeeding knowledge was defined as information and facts about infants' feeding method owned by the mother (Ratananugool, 2001). Empirical studies found that higher levels of maternal breastfeeding knowledge increased early breastfeeding initiation (Hidayat & Dewantiningrum, 2012), breastfeeding exclusively, and whole breastfeeding duration among Indonesian mothers (Wicitra, 2009). The greater the father's knowledge regarding breastfeeding also predicted exclusive breastfeeding duration significantly (Susin et al., 1999).

Several key concepts of breastfeeding knowledge were addressed in the literature. In order for the mother to perform EBF, they need the following information: exclusive breastfeeding definition, exclusive breastfeeding benefits for the infants, exclusive breastfeeding benefits for the mothers, exclusive breastfeeding duration, strategy to maintain adequate milk supply, breast milk quality beliefs, the impact of

bottle feeding use, breast milk expression management (Susin et al., 1999), breastfeeding frequency per day, duration of each breastfeeding time, formula supplementation (Hellings & Howe, 2000), assessment, prevention, and management of breastfeeding problems (Susin et al., 1999), nutrition during lactation, breastfeeding physiology (Hellings & Howe, 2000; Susin et al., 1999;), and contraception during breastfeeding (Grossman, Harter, & Hasbrouck, 1991). In addition, the mother also needs knowledge about basic breastfeeding techniques, breastfeeding initiation, special infant/maternal breastfeeding needs, basic pharmacokinetics of breastfeeding (Bernaix, Beaman, Schmidt, Harris, & Miller, 2010), and breast milk contraindications (Leavitt, Martínez, Ortiz, & García, 2009).

Attitude Toward Breastfeeding

The maternal attitude toward breastfeeding has been selected as one of the concept components in the study. An individual belief regarding the behavior develops the attitude toward the behavior (Ajzen, 1991). According to Ajzen (1991, p.191) "we form beliefs about an object by associating it with certain attributes; i.e. with other objects, characteristics, or events". In the TpB, attitude toward behavior refers to an individual positive or negative evaluation toward a specific behavior based on his/her beliefs of the consequences of a behaviors' outcome and the individual evaluation regarding the behavior outcome (Ajzen, 1991).

The Theory of Planned Behavior assumes that an individual's attitude toward specific behavior in a specific context affects person's intention to perform the behavior. In this theory, a more favorable attitude will produce a stronger intention in the individual to carry out the behavior; in contrast, an unfavorable attitude will lessen

an individual's intention to perform a specific behavior. Empirical study revealed that attitudes toward breastfeeding significantly influenced intention to exclusive breastfeeding among Bangladeshi mothers (S. Khatun, 2010). Mothers who had a favorable appraisal toward exclusive breastfeeding produced intention to exclusive breastfeeding their infants (S. Khatun, 2010). In addition, religious and cultural beliefs also predispose maternal beliefs regarding breastfeeding among Muslim mothers. In this study, religious and cultural beliefs toward breastfeeding among Indonesian mothers were included in the Attitude Breastfeeding Questionnaire.

Maternal attitude toward EBF influences intention to exclusive breastfeeding significantly among Muslim mothers (Khatun, Punthmatharith, & Orapiriyakul, 2010). Religious beliefs shape personal perceptions regarding health related behavior. Generally, Muslim mothers have positive attitude toward breastfeeding. Islam recommends all Muslim mothers should breastfeed their infants from birth up to 2 years old. Mothers who breastfeed the infants up to two years of age will receive a reward from God and mothers who refute breastfeeding the infants will receive the Gods' penalty (Shaikh & Ahmed, 2006). Religiosity affects the way of human life. Religiosity affects health behavior by forming individual perceptions and attitude toward health behavior based on religious values (Lindeman & McAthie, 1999). Greater mother's religiosity predicts breastfeeding duration (Azaiza & Palti, 1997) and breastfeeding initiation significantly (Clements, Bailey, & Wright, 2010).

Cultural beliefs influence individual perceptions regarding health behaviors. Health and healing process are viewed differently among social groups (Vaughn, Jacquez, & Baker, 2009). Cultural beliefs have an important role in health behavior among South East Asian people. Asian mothers tend to obey traditional practice during

postpartum period (Kaewsarn, Moyle, & Creedy, 2003). There are four categories of culture beliefs related to breastfeeding; beneficial, harmless, harmful, and uncertain (Skeel & Good, 1988). An example of a beneficial belief is prohibition to go outside the home before 35 days after delivery. This provides an opportunity for the mother to build attachment to the infant and breastfeed on the infants' demand. This practice belief can be maintained. Other beliefs have a harmful effect should be avoided, such as discard the colostrum and giving prelactal food or water during the first day of infants' age. An example of a harmless cultural belief was a mother drinking cornmeal beverage to increase breast milk supply. An uncertain cultural belief is the mothers' covering her shoulders during breastfeeding the infant (Skeel & Good, 1988).

Intention to Exclusive Breastfeeding

The Theory of Planned Behavior proposed intention as the central factor of human behavior (Ajzen, 1991). Intention is defined as individual desire to perform a specific behavior. Intention is also characterized by how strong individual willingness is to accomplish the certain behavior (Ajzen, 1991). A greater intention to carry out a behavior will produce the more success performing the behavior. Empirical studies have showed that intention to exclusive breastfeeding correlated with breastfeeding as a behavior. Maternal intention to exclusive breastfeeding significantly correlated with whole breastfeeding duration (Dodgson et al., 1998; Ducket et al., 2003) and EBF duration (Bai, et al., 2011).

According to Ajzen (1991), the Theory of Planned Behavior has three conceptually independent predictors of intention: Attitude toward behavior, subjective norm, and perceived behavioral control. This study includes only the attitude toward

behavior that was changed to attitude toward breastfeeding. Evidence from Muslim mothers shows that attitude toward breastfeeding predicted intention to exclusive breastfeeding (S. Khatun, 2010). There are no empirical studies in Muslim mothers which revealed that subjective norm and perceived behavioral control corelated with or predicted breastfeeding duration.

Breastfeeding Duration

The Theory of Planned Behavior defined behavior as a person's observable and measurable action to a specific condition which also consider a certain goal while performing the action (Francis et al., 2004). The proposed behavior has to be defined clearly regarding its target, action, context, and time elements (Francis et al., 2004). In this study, the target was a working mother, action was breastfeeding, context was the Muslim population, and the time was the length a mother provides breast milk only to the infant since birth.

Previous studies defined breastfeeding as a behavior differently. Ratananugool (2001) defined breastfeeding behavior as mother’s decision to provide breast milk only, breastfeed partially, or formula only to their infants. In addition, a study (Dodgson et al., 2003) in Hong Kong used breastfeeding duration as the behavior variable. The researcher measured the breastfeeding duration using mother’s self-reported about the length of breastfeeding their infant (Dodgson et al., 2003). In this study, breastfeeding duration was defined as the length in which mothers provide only the breast milk for their infants. WHO (2013) classifies mothers who provide breast milk only to the infant from birth up to six months age as exclusive breastfeeding. Supplementary food is started at six months with continued breastfeeding up to two years of infants’ age or

beyond (WHO, 2012). Mothers who provide supplementary food or water besides the breast milk below six months of infants' age are categorized as non EBF.

EBF duration has been extended from four months to six months (WHO, 2013). The EBF duration extension was based on a systematic review conducted by Kramer and Kakuma (2007) which found that the six months EBF duration provided more benefits for both infants and mothers, particularly in developing countries. A trial study (Dewey, Cohen, Brown, & Rivera, 2001) in Honduras highlighted that six months EBF duration gave more benefits to low income mothers.

Family Support

Family support is a kind of social support which is received from family members. Social support is defined as the benefits taken from interaction with other people in social networks to deal with problems by receiving psychological or corporeal assistance (Cohen, 2004). Family support is defined as the support which is provided by the family to the other family members whenever they need (Biswas, 2010). Another researcher (Jimping, 2000) defined family support as the perceived or actual assistance from other family members to solve the perceived or actual problem. The types of family support followed the social support types proposed by House (as cited in Biswas, 2010). According to House (1981), social support consisted of emotional, informational, appraisal, and instrumental support. Emotional support was giving a person a feeling of being loved, cared for, concerned, trusted, backed up, and accepted. Thus, support increases the person feelings of self-esteem (House, 1981). Informational support is defined as providing comment, suggestion, and advice verbally or written in a problem solving process (House, 1981). Appraisal support is

defined as providing reinforcement, acknowledgement, and constructive feedback to another person due to his/her problem (House, 1981). Instrumental support is defined as providing direct assistance or giving appropriate devices, tools, services, or materials to a person to solve his/her problem (House, 1981). Social support enhances the ability to overcome problems, develop self-esteem, improve self-confidence, increase coping mechanisms to overcome the stressors, and reduce levels of stress across the life span (Lakey & Cohen, 2000). The postpartum period is one of the stressful life events for a mother and other family members.

The family has a unique role that cannot be replaced by other people. The family helps each other by providing resources and services during a postpartum period. Family support had a significant role in exclusive breastfeeding continuation in Bangladesh (Giashuddin & Kabir, 2004) and Indonesia (Berlian, 2010). Family support helps mothers maintain breastfeeding duration (Biswas, 2010). Family support influences intention to exclusive breastfeeding, initiation, exclusive breastfeeding, and prolonged breastfeeding duration (Sikorski, Renfrew, Pindoria, & Wade, 2003).

Nearby family members are assumed to provide the family support for breastfeeding mothers. Mothers identified their husband (Ekström, Widström, & Nissen, 2003) and grandmother (Ekström et al., 2003; Mitra et al., 2004) as the family support sources. The examples of family support were husband does the household duties, help mother take care the infant, meet the mothers' needs during breastfeeding, and comforting the mother (Februhartanty, Bardosono, & Septoari, 2006), and grandmother suggested some traditional herbs and massage to increase breast milk

production (Manurung, 2012). The influence of the husband significantly affected exclusive breastfeeding practice (Humphreys, Thompson, & Miner, 1998).

Workplace Support

Workplace support has an important role in exclusive breastfeeding among working mothers. Workplace breastfeeding support for lactating working mothers comes from coworkers (Stewart-Glenn, 2008), employers (Ortiz, McGilligan, & Kelly, 2004), and policy at the level of the work organization and nationally (Dodgson, Chee, & Yap, 2004). Policy makers should consider breastfeeding policy in every office since the benefits of breastfeeding are not only for the infants and mothers but also for the employers (Mensah, 2011). Moreover, breastfeeding support in the workplace increases female employmee' job satisfaction and they have more commitment to their job compared to female employees who do not receive breastfeeding support at work (Mensah, 2011).

Breastfeeding support in the workplace significantly increases the breastfeeding duration among working mothers (Mensah, 2011). According to Bai, Peng, & Fly (2008), the key components of workplace breastfeeding support include technical, environmental, facility, and peer support. Other studies have explained that workplace support included company policy related to the lactating employee (Chow, Fulmer, & Olson, 2011), allowing sufficient maternity leave (Guendelman et al., 2009), providing break time to breastfeed at home or breast milk pumping in the workplace (Rejeki, 2008), providing a comfortable room to express the breast milk, allowing break times to take a meal, and providing sufficient facilities to store the breast milk (Dodgson et al., 2004).

Breastfeeding Problems

Evidence show that breastfeeding problems are a significant factor influencing exclusive breastfeeding duration (Taveras et al., 2004) and breastfeeding duration at the early postpartum period (Ratananugool, 2001). Wambach (1997) defined breastfeeding problems as the interference experienced by the mother or infant due to the breastfeeding process. The major causes of breastfeeding problems were lack of mothers' knowledge, inappropriate information from significant others, and lack of a health providers' preventive guidance (Hockenberry & Wilson, 2012).

Previous studies have showed that several problems occur while breastfeeding the infant. Breastfeeding problems were sore nipples (J. A. Scott, Binns, Oddy, & Graham, 2006), mastitis, breast engorgement, breast abscess (Khassawneh et al., 2006), painful nipples during breastfeeding (Gill, 2009; Lewallen et al., 2006; Wojcicki et al., 2010), difficulty to latch on (DiFrisco et al., 2011; Gill, 2009; Lewallen et al., 2006), embarrassment to breastfeed in public area, formula supplementation in the hospital, mother perceived infant preferred formula feeding than breast milk (Gill, 2009), mother felt very tired because of several household tasks (DiFrisco et al., 2011), and being too tired to wake up in the night (Agunbiade & Ogunleye, 2012).

Wambach (1997) developed an instrument to measure breastfeeding problems. Wambach (1997) stated in her study that the most common breastfeeding problems were sore or cracked nipples, engorgement, leaking breast, frequent feeding, latch on and sucking difficulty, infant fussiness and sleepiness, low breast milk production, perceived embarrassment, and breastfeeding among working mothers. In addition, painful nipples, delayed let-down reflex, plugged ducts, and mastitis also potentially disturb breastfeeding (Hockenberry & Wilson, 2012).

Sufficient Milk Supply

Maternal preception toward the adequacy of her breastmilk supply plays a significant role in breastfeeding duration. Sufficient milk supply (SMS) is maternal perception of the adequacy of her breast milk supply to fulfill her infants' need. Evidence shows that perceived sufficient milk supply maintains breastfeeding duration (Hill & Humenick, 2007). The opponent of sufficient milk supply is insufficient milk supply (IMS). Hill and Humenick (1989) proposed the term insufficient milk supply to depict the maternal perception that her breastmilk supply is inadequate to fulfill the infant's necessity.

A study was conducted by Hill and Aldag (1991) to examine the predictors of IMS. This study included both mothers with perceived IMS and mothers who did not perceive IMS at eight weeks postpartum. This study revealed that maternal confidence, paternal support, maternal health, mother-in-law disapproval, and infant birth weight accounted for 56.7 percent of the variance of IMS. Furthermore, baby behavior, solid foods, and formula accounted for 70.4 percent of the variance of IMS. In addition, maternal confidence, maternal health, mother-in-law disapproval, baby behavior, solid foods, and formula predicted 78.04% of the IMS cases precisely (P. D. Hill & Aldag, 1991). Furthermore, Hill and Humenick (1996) developed an instrument to measure IMS indicators including perceived infant satisfaction, maternal satisfaction, and maternal confidence. The instrument was called the H & H Lactation Scale.

Assessment of the sufficiency of milk supply perception is important because true inadequate breast milk supply was rare, however; the perception of low breast milk supply was common (Binns & Scott, 2002). The cause of IMS can be categorized as a physiological and psychological problem (Gatti, 2008). Some mothers produced low

breast milk supply because physiological causes, such as age more than 35, hypertension, pregnancy induced hypertension, hormonal disorder, obesity, pregnancy during lactation, maternal nipple anomaly, breast trauma, breast surgery, breast cancer, insufficient glandular tissue, chronic disease, taking breast milk production suppression medicine, insufficient calorie intake, food restrictions, food nutrition absorption, and gastric bypass history (Mannel, Martens, & Walker, 2007).

The infants' physiology also influenced breast milk production, in as much as the amount of breast milk produced depends on the infants' ability to empty milk within the breast. The risks of low breast milk suckling ability were long sleep period of infants (Harris, 2011; Mannel et al., 2007), premature infants, low weight gain due to a genetic factor, anomaly in mouth and tongue, weak sucking reflex, anomaly in airway, fracture during birth, digestive tract disease, nutrient mal-absorption, metabolic problems, and uncomforted (Mannel et al., 2007). The physiological causes of low breast milk production influenced five percent of lactating mothers and the major etiology of perceived insufficient milk supply was concerning breastfeeding management (Neifert, 2001).

Although there were several physiological causes of IMS, the majority of IMS were due to psychological factors such fussy infants, frequently crying infants, fewer infants' weight gain, frequently breastfed infant, long duration of breastfeeding, and then infant become fussy while the breastfeeding finish (Harris, 2011; Mannel et al., 2007), feeling softer breast, breast feeling less full, and perceived infant not satisfy with breastfeeding only were perceived associating with insufficient breast milk production. Less social support, postpartum depression, emotional problems, unplanned pregnancy, severe psychological history, smoking, alcohol consumption, and deal with

breastfeeding problems also influenced maternal perceptions concerning breast milk production (Mannel et al., 2007). Misinterpretation of infants' cues may lead to the perceived low breast milk supply.

Several previous studies found that insufficiency of breastmilk supply affects breastfeeding duration significantly. The insufficiency breastmilk supply predicted exclusive breastfeeding duration among preterm (Hill & Humenick, 2007) and term infants (Hill & Humenick, 2007) significantly. Mothers who perceived that their breastmilk insufficient were more likely to give formula milk to their infants compared to mothers who perceived that their breastmilk supply was enough both in term (Hill & Humenick, 2007a) and preterm infants (Hill & Humenick, 2007b).

Breastfeeding Initiation

Breastfeeding initiation is the first gate of an infant feeding process. Breastfeeding initiation is defined as the process of feeding the infant immediately after birth, where the infant moves toward to the mother's nipple (not proffered to the nipple) (WHO, 2013). Proper management of breastfeeding initiation influences EBF duration and whole breastfeeding duration. Evidence supported this as breastfeeding initiation correlated with EBF duration (Kumar, Agarwal, & Swami, 2006). Breastfeeding initiation is also significantly correlated with breastfeeding knowledge, breastfeeding support (Khoury, Moazzem, Jarjoura, Carothers, & Hinton, 2005), and intention to exclusive breastfeeding (Perrine, Scanlon, Li, Odom, & Grummer-Strawn, 2012).

Early breastfeeding initiation has saved one million infants' lives in their first few weeks after birth. WHO (2013) recommended breastfeeding initiation is carried out in the first hours after delivery which is well known as "early initiation of breastfeeding". Breastfeeding initiation aims to keep the infant in a warm environment with skin to skin contact with the mother and give colostrum to infant as the first infant feeding. WHO (2012) provides a breastfeeding guideline to improve breastfeeding initiation rates.

The key components of breastfeeding initiation include giving a mother sufficient information related to breastfeeding initiation during an antenatal period, helping the skin to skin process and assessing infants' readiness to move toward the breast, supporting the process with breastfeeding initiation related health policies and trained health manpower, and facilitating breastfeeding initiation at home birth.

In summary, the Theory of Planned Behavior was combined with other concepts in this study. The researcher selected four concepts from the Theory of Planned Behavior and five other concepts based on empirical study findings that fit the study context. The four concepts from the Theory of Planned Behavior were breastfeeding knowledge, attitude toward breastfeeding, intention to exclusive breastfeeding, and breastfeeding duration. The five other concepts from empirical study findings were family support, workplace support, breastfeeding problems, sufficient milk supply, and breastfeeding initiation. The proposed hypothesized model of breastfeeding duration among working Muslim mothers was presented in Figure 1.

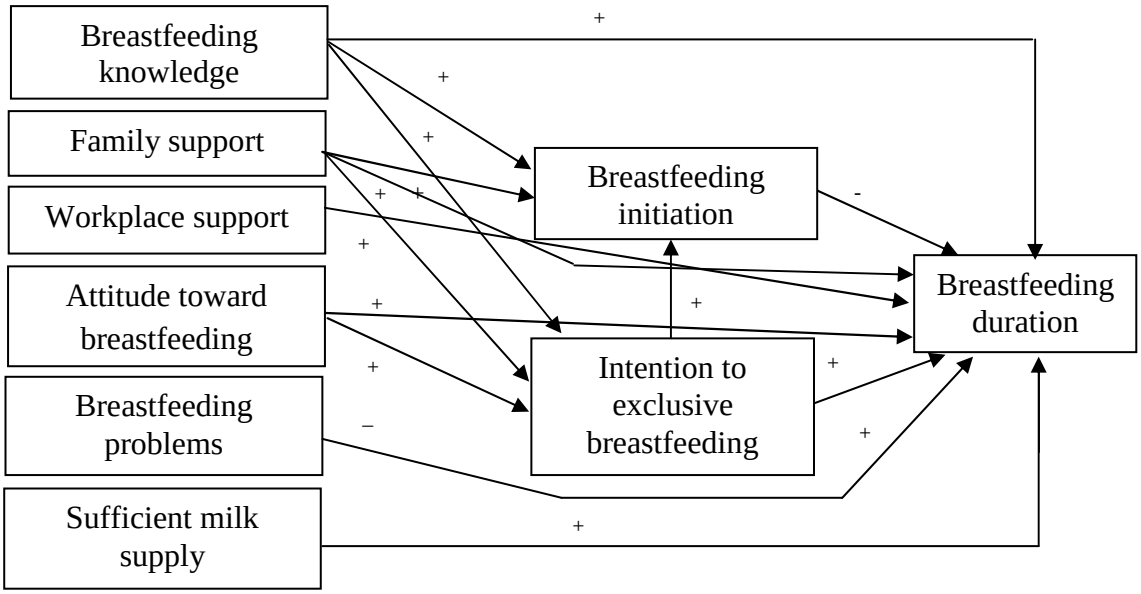

Figure 1. The Proposed Causal Model of Breastfeeding Duration among Working Muslim Mothers

The research hypotheses in this study are as follows:

1. The initial model fits the data.
2. Breastfeeding knowledge, family support, and intention to exclusive breastfeeding have direct and positive effects on breastfeeding initiation.
3. Breastfeeding knowledge, family support, and attitude toward breastfeeding have direct and positive effects on the intention to exclusive breastfeeding.
4. Breastfeeding knowledge, family support, workplace support, attitude toward breastfeeding, sufficient milk supply, and intention to exclusive breastfeeding have direct and positive effects on breastfeeding duration.
5. Breastfeeding problems and breastfeeding initiation have direct and negative effects on breastfeeding duration.

6. Breastfeeding initiation mediates the relationships between breastfeeding knowledge and breastfeeding duration, family support and breastfeeding duration, and intention to exclusive breastfeeding and breastfeeding duration.
7. Intention to exclusive breastfeeding mediates the relationships between breastfeeding knowledge and breastfeeding initiation, family support and breastfeeding initiation, and attitude toward breastfeeding and breastfeeding initiation.
8. Intention to exclusive breastfeeding mediates the relationships between breastfeeding knowledge and breastfeeding duration, family support and breastfeeding duration, and attitude toward breastfeeding and breastfeeding duration.

Definition of Terms

Breastfeeding knowledge is defined as the level of mother's possession of information or facts regarding breastfeeding benefits, effective feeding, colostrum, infant feeding method, breastmilk expression, duration of feeding, complementary feeding, breastfeeding problems, and practical aspects related to breastfeeding. Breastfeeding knowledge was measured by the Modified Breastfeeding Knowledge Questionnaire (Ismail & Sulaiman, 2010) which consisted of 50 items. Each item had categorical responses of correct and incorrect. A correct response was scored as 1, whereas a wrong response scored was as 0. The possible range was 0 to 50, with higher scores indicating greater mothers' breastfeeding knowledge.

Family support is defined as the degree of mother's perception of family members' assistance during lactation including emotional, instrumental, informational, and appraisal support related to EBF. Family support was measured using the Modified Family Support Questionnaire (Biswas, 2010). It measured mothers' perceptions regarding emotional, instrumental, informational, and appraisal assistance associated with EBF. There were 20 items with four dimensions: emotional (5 items), instrumental (5 items), informational (5 items), and appraisal support (5 items). This instrument was a self-report questionnaire using a 5-point Likert scale which ranged from 1 (never) to 5 (always). The higher score represented high support perceived by the mother.

Workplace support is defined as the degree of mother's perceptions of employer and coworker assistance during lactation. It included allow fair maternity leave, provide representative breast-pumping facilities at workplace, and permit some break time for breast milk pumping or breastfeed the infants' directly in an adequate place in the office. Workplace support was measured using The Modified Workplace Breastfeeding Support Scale (Bai, et al., 2008). The total number of items in the scale was 12. A higher score represented high workplace breastfeeding support perceived by the lactating working mother.

Attitude toward breastfeeding is defined as the grade of mother's belief regarding EBF for the first six months of infant life and evaluation of the outcome of this belief. Attitude toward breastfeeding was measured by The Modified Breastfeeding Attitude Questionnaire (S. Khatun, 2010). This questionnaire included 50 questions to measure breastfeeding beliefs (25 items) and outcome evaluation of breastfeeding

beliefs (25 items). A 5-point Likert scale was used for all items. Higher scores indicated greater mothers' attitude toward breastfeeding.

Breastfeeding problems is defined as the actual problems experienced by mothers while breastfeeding the infants. Breastfeeding problems were measured by The Breastfeeding Experience Scale (Wambach, 1997). This scale consisted of 17 multiple-choice items and one open-ended item and a 5-point rating scale for each item. A higher score indicated greater perceived severity of breastfeeding problems.

Sufficient milk supply is defined as the maternal perception toward the adequacy of her breastmilk supply to fulfill the infants' need. Sufficient milk supply was measured using The nine-item H & H Lactation Scale (Punthmatharith & Singh, 2005). It consisted of a 9-item self-report instrument in which all items were measured on a 7-point Likert. A higher score reflected greater level of mothers' confidence/commitment, perceived infants' satisfaction with breast milk, and mother-infant breastfeeding satiety. A higher score on The nine-item H & H Lactation Scale (Punthmatharith & Singh, 2005) reflected higher sufficient milk supply.

Breastfeeding initiation is defined as the first time when the mother gives breast milk to the infant. WHO (2013) suggested early breastfeeding initiation should be done within the first hour after delivery. A infant who received first breast milk on the second day of life was categorized as late breastfeeding initiation (Edmond et al., 2006). Sooner breastfeeding initiation is the better. Breastfeeding initiation was measured by a question regarding how many hours after delivery the mother breastfed the infant for the first time. It was developed by the researcher based on the literature review.

Intention to exclusive breastfeeding is defined as the degree of mother's motivation to perform or not perform EBF for at least six months of infant's age when the mothers were on the third trimester of pregnancy. Intention to exclusive breastfeeding was measured by the Intention to Exclusive Breastfeeding Scale developed by Khatun, Punthmatharith, and Orapiriyakul (2010) (S. Khatun, 2010). A 0 to 10 point numeric rating scale was used containing endpoints of "I should not exclusively breastfeed my baby for at least six months postpartum" (0) and "I should exclusively breastfeed my baby for at least six months postpartum" (10). A higher score represented a stronger intention to exclusive breastfeeding.

Breastfeeding duration is defined as a mothers' report about the length of providing breastmilk as the only infant feeding source. The maximum duration of breast milk only as infant's feeding source was six months (WHO, 2011). Breastfeeding duration was measured by a question about the length of breast milk as the only infant feeding source since infants' birth up to six months. Answers were presented in a range from birth up to six months. It was developed by the researcher based on the literature review.

Scope of the Study

This is a cross-sectional study which is aimed to examine the causal model of breastfeeding duration among Indonesian working mothers of infants' aged between 6 months up to 1 year old in Central Java Province, Indonesia.

Significance of the Study

A causal model of breastfeeding duration among working Muslim mothers provides empirical nursing knowledge. The study results were expected to be used to enrich the body of knowledge for improving breastfeeding duration, particularly knowledge about predictive factors affecting breastfeeding duration in the Muslim population, especially in Indonesia. The study results were also expected to be used as basic knowledge to solve the short duration of exclusive breastfeeding among working mothers in Indonesia. The structure of the study result provided concrete evidence for health promotion related to breastfeeding duration in Indonesia which can be used by nurses, public health workers, medical doctors, and lactation consultants in Indonesia.

The results of this study provided empirical knowledge for maternity nurses, particularly in Indonesia. These study results were expected to be used by nurse educators as learning material for nursing students to understand more the predictive factors of breastfeeding duration among Muslim mothers. For nurse researchers, this study's results might be useful as basic knowledge for further research. The study results were expected to provide evidence for further intervention studies to examine the most appropriate strategies to improve breastfeeding duration among Indonesian working Muslim mothers. Nurse practitioners can use this study's results to provide evidence based nursing care, such as promoting the EBF at antenatal care clinics by assessing mothers' attitudes toward EBF, examining mothers' intention to exclusive breastfeeding, evaluating mothers' knowledge related to breastfeeding, assessing the availability of workplace support and breast pumping facilities. At postnatal care clinics, nurses also provide information about breastfeeding duration, criteria of sufficient breast milk production, managing breast milk pumping, and overcoming the breastfeeding problems.

CHAPTER 2

LITERATURE REVIEW

This chapter provides the literature review related to this study topic. The literature review is presented as follows.

1. Breastfeeding
    1.1 Incidence
    1.2 Types
    1.3 Benefits
    1.4 Breastfeeding Management
    1.5 Health Policies Related to Breastfeeding in Indonesia
2. Breastfeeding Among Mothers
    2.1 Breastfeeding Among Working Mothers
    2.2 Breastfeeding Among Muslim Mothers
    2.3 Breastfeeding Among Working Muslim Mothers
3. Factors Associated with Breastfeeding and the Relationships among the Factors
4. Instruments Related to the Study Variables
5. The Proposed Causal Model of Breastfeeding Duration Among Working Muslim Mothers
6. Conclusion

Breastfeeding

Breastfeeding is a natural human process to provide infant feeding. Breast milk production is a maternal physiological adaptation after delivery and the process of breast milk production is called lactogenesis (Pillitteri, 2009). Lactogenesis usually starts late in the pregnancy. Lactogenesis is a process of breast milk production, storage, and ejection from the breasts. It is affected by prolactin and oxytocin hormone. Human milk is produced continuously at the alveolar lumen, then, it is storaged in the ductus mammae until it is removed from the breast. Milk production is stimulated by the prolactin hormone which gives a signal to the central nervous system (Kim, 2010). Breast milk production is also influenced by the milk expressed from the breast. When the ducts are empty, prolactine hormone is released to instruct milk production. In addition, the milk ejection from the breast is stimulated by oxytocin hormone. Under the oxytocine hormone stimulation, the myoepithelial cells around the alveoli and the ducts contract. Then, the milk is removed from the ducts. This process is called let-down reflex (Kim, 2010; Lawrence & Lawrence, 2011).

Breast milk produced during late pregnancy up to the first few days after delivery is called colostrums. The characteristics of colostrums are a yellowish white, thick, concentrated liquid that contains more antibodies, lower fat, and higher level of proteins compared to ordinary breast milk (Simpson & Creehan, 2008). The thick colostrum is sufficient to fulfill the infant's need because during the first few days after delivery the gastrointestinal system is immature and the size of the stomach is small (Lawrence & Lawrence, 2011). The colostrums can prevent a jaundiced infant because it removes excessive bilirubin, which increases during labor. The colostrums

also causes a mild laxative effect which encourages passage of meconium (Simpson & Creehan, 2008). Since the colostrums can be absorbed completely by the infant, the infant might not defecate for several days (Lawrence & Lawrence, 2011).

Incidence

Physiologically, breast milk production occurs during the first few days after delivery; however, some mothers do not provide breast milk to feed their infants in the few first days of the infant's life. A literature review showed that breastfeeding initiations during the first day of an infant's birth were 83 percent in the United States (Celi, Rich-Edwards, Richardson, Kleinman, & Gillman, 2005), 93 percent in Australia (Hauck, Fenwick, Dhaliwal, & Butt, 2011), 85 percent in Italy (Riva et al., 2007), 35.4 percent in Nepal (Pandey, Tiwari, Senarath, Agho, & Dibley, 2010), 83.3 percent in Sri Langka (Senarath et al., 2011), 46.1 percent in Timor Leste (Senarath, Dibley, & Agho, 2006), 27.5 percent in Bangladesh (Mihrshahi et al., 2010), and 57.6 percent in Indonesia (Statistics Indonesia, 2007). Early breastfeeding initiation has a strong correlation with exclusive breastfeeding practice up to six months (León-Cava, Lutter, Ross, & Martin, 2002).

The breastfeeding rate decreased per month and the EBF rates were low in almost all countries. Only 57.1 percent of Australian mothers still breastfed their infants at 9 weeks postpartum (Hauck et al., 2011). A study in Italia showed that 2 percent, 19 percent, 10 percent and 4 percent of Italian mothers were still breastfeeding at 3, 6, 9, and 12 months after delivery, respectively (Riva et al., 2007). In addition, the EBF rate in Nepal was 53.1 percent (Pandey et al., 2010), 75.8 percent of mothers performed EBF in Sri Lanka (Senarath et al., 2011), 30.7 percent of infants

were exclusively breastfed in Timor Leste (East Timor) (Senarath et al., 2006), 42.5 percent of infants were exclusively breastfed in Bangladesh (Mihrshahi et al., 2010), and 27 percent of Indonesian infants received exclusive breast milk from birth up to six months of age (Indonesia Statistics, 2012b).

Types

There are two types of breastfeeding practices for infants under six months: exclusive breastfeeding (EBF) and non-exclusive breastfeeding (non-EBF). Exclusive breastfeeding means infants receive only breast milk from birth up to six months old without any other water or food except drops and syrups containing minerals, medicines or vitamins. After that, breastfeeding should be given continuously together with supplemental food or water until the infant reaches two years of age (WHO, 2012). The length of EBF duration was extended from four months to six months. This change was based on the expert's review of scientific articles, which was done by Kramer and Kakuma (2009). The scientific review, underpinning the change of EBF duration, found that extending the EBF up to six months has reduced the infant's mortality and morbidity, particularly in developing countries (Kramer & Kakuma, 2009).

Another type of breastfeeding is non-exclusive breastfeeding (non-EBF). Non-EBF means that infants below six months old receive not only breast milk but also other liquids or foods as the feeding sources (WH0, 2012). Mothers commonly mixed breast milk with water (Davies-Adetugbo, 1997), honey, jaggery (brown sugar from sugar cane), ghee (claries butter), ghutti (herbal paste) (Al-Bar, 2006), rice porridge (Ergenekon-Ozelci, Elmaci, Ertem, & Saka, 2006; Inayati et al., 2012), formula milk

(Fikree, Ali, Durocher, & Rahbar, 2005; Khassawneh et al., 2006), goat's milk, ragi ganji (Khassawneh et al., 2006), flour porridge (Afifah, 2007; Geçkil, Sahin, & Ege, 2009), milk porridge, boiled and steamed rice, fruits, and instant prepared baby foods (Inayati et al., 2012).

Mallikarjuna et al. (2002) found that the decision taken by mothers to start infant feeding substitution (30.5 percent) was advised by other family members (68.3 percent) and was suggested by a community leader (1.2 percent). The non-EBF practice was related to low EBF knowledge (Afifah, 2007), perceived insufficient breast milk supply (Ergenekon-Ozelci et al., 2006), influence from grandmother or traditional birth attendant, cultural beliefs, and religious beliefs (Ergenekon-Ozelci et al., 2006; Geçkil et al., 2009; Kerr, Berti, & Chirwa, 2007). In the Muslim population, the infant's father or religious leader gives chewed dates to the infant on the first day after birth (Al-Bar, 2006). Prelactal food supplementation is against the WHO recommendation which states that each mother has to provide breast milk only from birth up to first six months of the infant's age.

Benefits

A literature review showed several advantages of breastfeeding for both infants and mothers. The benefits of providing EBF for infants are preventing morbidity and mortality from diarrhea (Lamberti, Walker, Noiman, Victora, & Black, 2011), reducing the number of hospital admissions (Quigley, Kelly, & Sacker, 2007), decreasing the risks of infections in the upper respiratory tract, lowering respiratory tract infections, reducing gastrointestinal infections before the age of six months (Oddy et al., 2006), and preventing candidiasis (Kadir, Uygun, & Akyüz, 2005).

Breastfeeding also has further benefits, such as preventing infant obesity (Fein & Roe, 1998; Senarath et al., 2011), protecting children from diabetes (Mandal, Roe, & Fein, 2010), and reducing the risk of childhood leukemia (Al-Sahab et al., 2010), increasing the child's intelligence (Jedrychowski et al., 2012; Senarath et al., 2006), and helping children gain optimal development (DiFrisco et al., 2011). Furthermore, adolescents who received breast milk during their infant age had a higher level of parental attachment, higher perception of being cared for, and lower overprotective feelings compared with bottle fed adolescents (Pandey et al., 2010).

The advantages of breastfeeding are not only for the infants but also for the mothers. The benefits of breastfeeding for the mothers are reduced risk of breast cancer (Chang-Claude et al., 2000), decreased risk of ovarian cancer (Danforth et al., 2007), reduced risk of diabetes type 2 (Lawrence & Lawrence, 2011; Pillitteri, 2009), prevention of cardiovascular disease (Tangkawanich, Yunibhand, Thanasilp, & Magilvy, 2008), increased weight loss (Ryan, Zhou, & Arensberg, 2006), and delayed menstruation after delivery (Egbuonu, Ezechukwu, Chukwuka, & Ikechebelu, 2005) which is used by Muslim mothers as a contraceptive method (Shaaban & Glasier, 2008).

Breastfeeding Management

Breastfeeding is a process that can be learned and prepared during pre-pregnancy or pregnancy. Knowledge of breastfeeding management may enhance the effectiveness of the breastfeeding process. Mothers who had sufficient knowledge regarding breastfeeding management were more likely to breastfeed for a longer duration (Tamiru & Mohammed, 2013). According to Simpson and Craheen (2008),

mothers have to recognize the management of breastfeeding. Learning the effective breastfeeding process includes correct latching on the areola, lying on the side and sitting breastfeeding positions, supporting the breast during breastfeeding using the C hold, keeping a breastfeeding frequency range of 8 – 14 times during each 24 hours, and maintaining the breastfeeding duration for at least 10 - 20 minutes for each feeding. After finishing a breastfeeding, mothers have to eliminate the air that entered the infant's stomach during the feeding process by positioning the infant's head higher than the stomach and then patting the baby's back to make the infant burp. Various signs indicate effective breastfeeding. The indicators of effective breastfeeding are the frequency of urination and defecation in accordance with the infant's age; the urine color should be clear and pale yellow, the infant gains weight, moisture at the mucous membranes, and having a range of infant behavior such as being awake, hungry, crying, and expressing satiety after breastfeeding (Simpson & Craheen, 2008).

Mothers may be taking some kinds of medication during the lactating period. Some kinds of medication taken by lactating mothers may be contained in the breast milk (Lawrence & Lawrence, 2011). However, mothers can continue breastfeeding because the physician always selects the appropriate and safe medicine to lactating mothers considering the infant's age (Anderson, Pochop, & Manoguerra, 2003). The most common reasons to use medication by lactating mothers are contraception, cold, dyspepsia, hemorrhoids, and breast infections (Lawrence & Lawrence, 2011). A lactating mother has to discontinue breastfeeding their infant if they are abusing drugs, receiving anti-metabolic drugs, or they are under radiotherapy treatment (Lawrence & Lawrence, 2011).

Health Policies Related to Breastfeeding in Indonesia

Breastfeeding promotion in Indonesia started when the National Movement for Increasing Breastfeeding program was launched in 1990. The program aimed to promote children's rights as stated in the UU No. 36/1990 about ratification of the convention on the rights of the child. The goal of this program was to promote breastfeeding as one of infants' rights (Indonesian Ministry of the State Secretary, 1990). The Indonesian government moved further to promote children's rights by launching the Baby Friendly Hospital Initiative (BFHI) program in 1992 and it was known as "Rumah Sakit Sayang Ibu dan Bayi". The main goal of this health policy was to increase early initiation of breastfeeding at the hospitals and midwifery private sectors. The BFHI program has ten steps in promoting early breastfeeding practice, maintaining EBF up to four months, and continuing breastfeeding until 2 years (Indonesian Ministry of Health, 1992).

The Indonesian government also made a certain regulation regarding breast milk substitution to promote the EBF up to four months of infant's age as stated in Kepmenkes No. 23/1997. The breast milk substitutes are semi-solid food and formula milk that can be used as nutritional sources for a child under six months old with special indications. The regulations concerning breast milk substitutes in Indonesia include: circulation of breast milk substitutes, labels of breast milk substitutes, prohibition of giving breast milk substitutes at maternity wards in hospitals and midwifery clinics, information and education about breast milk substitutes to the community, promotion of breast milk substitutes, marketing of breast milk substitutes, the training and supervision of breast milk substitutes, and sanctions for the violation of breast milk substitute marketing (Indonesian Ministry of Health, 1997).

Another Indonesian government policy about child protection was stated in UU No. 23/2002. In Article 22, it was mentioned that the government has an obligation and responsibility to provide facilities to support the implementation of child protection. It was then further explained that the facilities and infrastructure that should be provided by the government were a private room in public areas to breastfeed the infant and sufficient maternity leave duration for a female employee.

Maternity leave was regulated in UU No. 13/2003 Article 82 paragraph (1). The Law stated that female workers/laborers were entitled to a maternity leave for 1.5 (one and a half) months before the estimated birth date and 1.5 (one and a half) months after delivery according to calculations by an obstetrician or a midwife. Moreover, article 83 stated that lactating working mothers should have a sufficient opportunity to breastfeed their infants during work hours. Based on the explanation of Article 83, the company/office should provide a convenient place to breastfeed the infant directly or with expressed breast milk based on the company capabilities and consentience between the employer and the employee (Indonesian Ministry of the State Secretary, 2002).

The Indonesian government has extended the EBF duration from four months to six months which was stated in the Decree of the Health Ministry of the Republic of Indonesia No. 450/MENKES/SK/VI/2004. The main goal of this health policy was to promote the extension of EBF duration from four months to six months after delivery. The Indonesian government also established that at least 80 percent of Indonesian mothers provide EBF up to six months of the infant's age (Indonesian Ministry of Health, 2004). In addition, the Indonesian Ministry of Health, the Indonesian Ministry of Women Empowerment, and the Indonesian Ministry of Labor

made an agreement on breastfeeding in the workplace. The laws were stated in the 48/MEN.PP/XII/2008, PER.27/MEN/XII/2008, and 1177/MENKES/PB/XII/2008. These laws regulate the opportunity for female workers to breastfeed their infants directly or express the breast milk during work time. The duties of Indonesian Ministry of Women Empowerment were to motivate working mothers to breastfeed their infants and to promote the availability of breastfeeding rooms and breastfeeding breaks. The duty of the Indonesian Ministry of Labor is to encourage the employers to develop a regulation related to breastfeeding among working mothers in the workplace. Last, the duty of the Indonesian Ministry of Health is to educate the health professionals to be breastfeeding counselors; therefore, the health professionals are to provide and disseminate exclusive breastfeeding information to the community (Indonesian Ministry of Health, 2009).

The newest health policy related to EBF was stated in the law of Indonesian government No. 33/2012. This law regulates the responsibility of the government, the company, the public area administrators, and the community leaders in EBF promotion. EBF is promoted by providing lactation counseling and training to health providers, giving sufficient maternity leave after childbirth to working mothers, providing breastfeeding rooms in public areas and workplaces, and providing sufficient funding to support the EBF promotion activities in the community (Indonesian Ministry of the State Secretary, 2012).

A study (Fikawati & Syafiq, 2011) was conducted to analyze the Indonesian health policies related to EBF, early breastfeeding initiation, and the implementation of these health policies in Indonesia. This study assessed three Indonesian health policies related to EBF: Kepmenkes No. 237/1997, PP No. 69/1999, and Kepmenkes

No. 450/2004. The exclusive breastfeeding target was 80 percent for all of Indonesian mothers. Fikawati and Syafiq (2011) argued that the EBF target is nearly impossible to be achieved. Despite several health policies related to EBF issued by the Indonesian government, the EBF rates declined every year from 1994 to 2012, which was from 47 percent to 27.1 percent (IDHS, 1994, 2012). They argued that the existing Indonesian health policies related to EBF were incomplete and not comprehensive. In addition, breastfeeding initiation was not captured in the Indonesian health policies related to EBF even though evidence showed that breastfeeding initiation lengthened EBF duration.

Afterward, Fikawati and Syafiq (2011) suggested that the Indonesian government update and renew the existing EBF policies to be more relevant in terms of the content, the context, the process, and the actor in the field. The EBF policy should always include a breastfeeding initiation component. They also argued that a new policy related to EBF should include a maternity leave extension for working mothers, formula advertisement regulation, penalties for midwifes who do not facilitate early breastfeeding initiation and provide a formula to the mother as a gift, reward system for the mothers who practice EBF up to six months, and a monitoring and evaluation system to strengthen the implementation of the Indonesian health policy related to EBF in the community (Fikawati & Syafiq, 2011).

The Indonesian government policy related to EBF among working mothers mentioned that every workplace should provide a breast milk pumping facility to support EBF among working mothers. The policy was stated in government law numbers 48/MEN.PP/XII/2008, PER.27/MEN/XII/2008, and 1177/MENKES/PB/XII/2008. All of these laws regulated the opportunity for female workers to express the

breast milk during working time. However, the availability of breast milk pumping facilities in the workplace was unsuccessful in increasing the EBF rate among working mothers in Indonesia. The EBF rate among Indonesian working mothers declined gradually every year (IDHS, 2012).

According to Riyadi (2013), working mothers preferred to provide a formula to their infants because of a lack of motivation to pump the breast milk, lack of break times during work hours, feeling uncomfortable pumping the breast milk, and having demanding job duties in the workplace (Riyadi, 2013). In addition, a study by L. Rahmah (2012) found that most of the working mothers preferred to provide formula to their infants while working outside the home. The study found that the reasons working mothers did not breastfeed exclusively were psychological problems, double burden, lack of lactation management knowledge, lack of breastfeeding preparation during pregnancy, low motivation of the mothers, difficulty taking breaks for breast milk pumping, and lack of employer and coworker support. It seems that the availability of breast milk pumping facilities is not the basic problem behind the short duration of EBF among Indonesian working mothers. Support from the employers was needed to solve the low EBF rate and the short EBF duration among working mothers (Rahmah, 2012).

Breastfeeding among Mothers

Breastfeeding is a physiological and social way to feed the infant. Normally, breast milk production occurs at the third trimester of pregnancy or the first few days after delivery (Lawrence & Lawrence, 2011). Breastfeeding is also received as a norm

in the majority of the population (Pillitteri, 2009); however, exclusive breastfeeding was uncommon in some parts of the population, particularly among working mothers (Tarka, et al. 2001) and Muslim mothers (Amin, Hablas, & Al Qader, 2011). The following sections consisted of breastfeeding among working mothers, breastfeeding among Muslim mothers, and breastfeeding among working Muslim mothers.

Breastfeeding among Working Mothers

The lower birth rate, better educational status, and higher employment opportunities for women currently support women working outside the home. Becoming a working mother has both positive and negative impacts. The positive impacts of being a working mother were supporting family income (Baum, 2003), reducing the risk of postpartum depression (Miyake, Tanaka, Sasaki, & Hirota, 2011), having higher self-esteem (Ahmad-Nia, 2002), and having a higher level of maternal well being (Trzcinski & Holst, 2007). In contrast, the negative impacts of being a working mother were having a greater stress level (Ahmad-Nia, 2002), having a higher role stress (Morris & Levine, 2004), having poorer child cognitive development (Baum, 2003; Han, Waldfogel, & Brooks-Gunn, 2001), having poorer child behavior development (Han et al., 2001), having less time to take care of the child (Wheelock & Jones, 2002), and having a higher risk of child malnutrition (Toyama, Wakai, Nakamura, & Arifin, 2001).

Working status was a major influencing factor of breastfeeding practice among Canadian mothers (Kehler, Chaput, & Tough, 2009). Evidence showed that mothers who worked outside the home were more likely to practice non EBF than those who stayed at home (Al-Sahab et al., 2010; Sasaki et al., 2010; J. A. Scott et al.,

2006; Tarkka, Paunonen, & Laippala, 2001). Maternal working status was a predictor of short breastfeeding duration (J. A. Scott et al., 2006). Working mothers overcome several barriers to breastfeed their infants. Barriers to perform EBF by working mothers were explored in a study by Stewart-Knox, Gardiner and Wright (2003). They did a focus group discussion among working mothers in Northern Ireland. This study found that there were four themes of breastfeeding problems among working mothers. Working mothers experienced social, psychological, environmental, and practical problems to perform EBF after returning to work (Stewart-Knox et al., 2003).

Another study (Reifsnider et al., 2003) among WIC employees was conducted in the United States. This study included 39 women and 1 man. The majority of the participants were Hispanic (92 percent). The participants reported both their own experience and the WIC clients experience related to breastfeeding. The themes in this study were the breastfeeding benefits, breastfeeding obstacles, breastfeeding support to lactating mothers, and breastfeeding cultural beliefs. Generally, the participants perceived that breastfeeding was the best infant feeding source. However, the participants reported several breastfeeding obstacles that impeded the breastfeeding process.

The breastfeeding barriers among this study's participants were insufficient knowledge about the breastfeeding process, position of latching on, pain during breastfeeding, embarrassment of breastfeeding in public areas, and inadequate breastfeeding support from family members and health professionals in the hospital. Cultural beliefs also affected the breastfeeding initiation and breastfeeding process. The participants mentioned that going to a funeral or living through a stressful life

event caused bad production of breast milk. So mothers could not breastfeed the infants because the breast milk became bad. Another participant stated that the infant needed herb tea when the infant had difficulty falling asleep at night (Reifsnider et al., 2003).

A qualitative study in the United States aimed to explore the breastfeeding experience among working mothers after returning to work (Rojjanasrirat, 2004). This study revealed that four themes were found. They were support, attitude, strategic planning, and psychological distress. The study participants articulated support for them, such as a tolerant atmosphere, a special breast milk pumping room, a role model from coworkers, and flexible time to express the breast milk. The participants also mentioned that they needed to keep up a positive attitude to maintain and achieve the breastfeeding duration as intended. Breastfeeding problems were anticipated by making strategic plans to achieve the intended breastfeeding duration. Next, the participants mentioned about role conflict developed a physiological distress. The job burden and the breastfeeding duty increased the working mothers' stress. They stated distressed feelings of blame, tension, and surrender during a lactating period.

Working mothers experience role conflict in their lives. Perception about a good working mother was explored. This study included 11 working mothers after finishing their maternity leave. This study revealed that there were three themes reflecting perception of a good working mother such as good working mothers were perfect in child care, good working mothers have an equal relationship with husband, and good working mothers do all of job duties (Buzzanell et al., 2005). Working mothers also had to struggle to provide breast milk to their infants after returning to work.

The qualitative studies above were supported by other quantitative studies. A literature review conducted by Dennis (2006) revealed that three papers in this literature review reported that working mothers were more likely to have a shorter duration of exclusive breastfeeding than non-working mothers. Senarath, Dibley, and Agho (2010) studied risk factors of non-EBF practices in East and South East Asia. This study used secondary data from the Demographic and Health Surveys between 2002 and 2005. This study found that working status was a significant factor that caused non-EBF practice among East and South East Asian mothers (Tarkka et al., 2001). Another study in Cambodia confirmed that maternal working status significantly influenced the non-EBF practice (*OR* = 4.71, 95%CI = 2.77–8.01) (Sasaki et al., 2010).

Expressing breast milk in the workplace is the best solution to keep breast milk production. Mothers need to prepare themselves regarding the physiology of breast milk production and lactation management during pregnancy. According to Lawrence and Lawrence (2011), breast milk production is based on supply and demand principles. Breast milk retention in the breast tissue causes a decrease in breast milk production. Working mothers have to express the breast milk at a workplace regularly. Working mothers need to prepare the equipment that supports the process of breast milk pumping and storage. Lactating working mothers can express the breast milk either manually using their hands, or electrically using a breast milk pumping machine. The expressed breast milk is stored in a glass or plastic bottle which is kept in a refrigerator or cooling bag during working hours and then put into the freezer at home.

The expressed breast milk is provided for the infant when the mother goes outside the home for work. The infant's caregiver must have sufficient knowledge regarding expressed breast milk storage, preparing, and administration to the infant. According to The Academy of Breastfeeding Medicine Protocol (2010), frozen expressed breast milk may not be heated by boiling (over the fire) or warming using a microwave. Frozen expressed breast milk must be kept in the chiller one night before use and then the cooled expressed breast milk must be put in a container containing water at room temperature. The expressed breast milk can be given to an infant using a spoon, cup feeder, or pipette. Providing expressed breast milk using a bottle should be avoided because it will cause nipple confusion, hence infants will reject to suck their mother's breast (Lawrence & Lawrence, 2011).

Working mothers are expected to keep a balance between work duties and maternal role performance. Working mothers should perform their work duties as well as a male employee. On the other hand, working mothers have a maternal role which cannot be substituted by other people. An example of the irreplaceable maternal role is to breastfeed their infants. Breastfeeding among working mothers is not easy because of the high level of job stress, long separation from the infant during working hours, long working hours, lack of employer support, less time and place to express the breast milk, and high social expectation of the maternal role. Understanding factors influencing breastfeeding among working mothers will provide information to make the most appropriate intervention. The best strategy based on evidence can increase the breastfeeding practice among working mothers.

Breastfeeding among Muslim Mothers

Islam is the second largest religion in the world. Islam regulates all aspects of human life including child feeding duration. According to Shams (2011), Islam encourages Muslim women to breastfeed their infants up to 2 years old. Islam promotes breast milk as the best feeding source for infants. Breastfeeding is addressed in the Al-Quran, verse 2:233. In this ayah, Allah supports every Muslim mother to provide breast milk for her infant until 2 years of age and the mother can wean her infant before completing the 2-year breastfeeding period with agreement from her husband (Shaikh & Ahmed, 2006).

Evidence showed that Muslim mothers were more likely to breastfeed compared to the mothers of other religions. A study in Malaysia revealed that Muslim mothers in Malaysia were more likely to breastfeed compared to Buddhist or Christian mothers (Amin et al., 2011). This difference in practice is probably due to religious beliefs related to infant feeding. In Islamic philosophy, mothers who breastfeed their infants get God's reward and her sins are forgiven. The reward for a mother who breastfeeds the baby is a merit for every drop of breast milk she gives to her infant. Moreover, if the mother dies during the breastfeeding period, she is regarded as a martyr and goes to heaven to live after death. On the other hand, a mother who refuses to breastfeed her infant will get God's punishment in the next life (Shaikh & Ahmed, 2006). These beliefs strongly encourage Muslim mothers to breastfeed their infant up to 2 years old (Shams, 2011)**.** In Islam, human milk is preferable as an infant feeding source than animal milk. When a mother cannot provide her own breast milk to feed the infant, the mother can look for a wet nurse to breastfeed her infant until the child is two years old (Moran & Gilad, 2007).

Another factor that encourages breastfeeding among Muslim mothers is a close kinship as known by “ukhuwah islamiyah.” It is described as the brotherhood of Muslims, whether or not they have a blood relationship among them. The breastfeeding support among Muslim mothers enhances the breastfeeding duration in the Muslim population (Bhalotra, Valente, & Van Soest, 2010). The examples of breastfeeding support as stated in the Qur’an are taking care of other children while the mother is breastfeeding the infant, providing food to the lactating mother, sharing ways to overcome breastfeeding problems, and motivating other Muslim mothers to breastfeed up to two years after delivery.

Despite nearly all Muslim mothers initiate breastfeeding and perform breastfeeding up to two years, the EBF rate is still quite low in the Muslim population. Exclusive breastfeeding during the first six months among the infants in the Muslim population is uncommon (Ghwass & Ahmed, 2011). According to Giashuddin and Kabir (2004), the mean duration of total breastfeeding was 31.3 months. However, the mean duration of exclusive breastfeeding among Bangladeshi mothers was only 3.67 months. This study also found that 69.9 percent women gave supplementary food to their babies before reaching six months of age (Giashuddin & Kabir, 2004). In addition, a study by Ho et al. (1999) that included 2,839 Malaysian Muslim mothers revealed that the prevalence of mothers who have breastfed was 88.6 percent. The breastfeeding duration among these mothers reported an average of 28.01 weeks. This study also found that breastfeeding initiation was 41.4 percent, whereas the prevalence of exclusive breastfeeding was only 29 percent. There was even only 11.7 percent of mothers who continued their breastfeeding up to two years (Ho et al., 1999). Indonesia is not an Islamic country; however, having the largest population of Muslims in the

world has made the Islamic rules, including breast milk as the infant feeding source up to two years old, commonly accepted among Indonesian. Breastfeeding was religiously and culturally accepted as the most appropriate infant feeding method in Indonesia. In contrast, EBF was uncommon among Indonesian mothers (Liando, 2004).

Similarly, in the Middle Eastern countries, exclusive breastfeeding duration was short. More than half of Saudi Arabian mothers (77.8 percent) initiated breastfeeding within the first day after delivery; however, the exclusive breastfeeding rate decreased gradually per month. Prevalence of the EBF practice within three days, two months and six months after delivery were 76.1 percent, 32.9 percent, and 12.2 percent, respectively (T. Amin et al., 2011). A study (Olang, Farivar, Heidarzadeh, Strandvik, & Yngve, 2009) in Iran found that the breastfeeding initiation rate was high but the exclusive breastfeeding rate was low. The statistics from Iran showed that 90 percent and 57 percent of the infants were breastfed at one and two-years of age, respectively. However, the exclusive breastfeeding rates at four and six months of the infants' age in Iran were 56.8 percent and 27.7 percent, respectively (Olang et al., 2009). Generally, the prevalence of a 2-year period of breastfeeding in Muslim countries was high; however, the EBF duration was low. This might be caused by the influence of their local cultural beliefs.

The local cultural practices in the Muslim population explained the attitude toward breastfeeding and breastfeeding practice (Saaty, 2010). Culture has a strong influence on the breastfeeding process. This practice was influenced by the traditional culture beliefs and suggestions from the traditional birth attendant (Fikreea et al., 2005).

Every ethnicity has different culture beliefs during a postpartum period which may affect the breastfeeding duration (Ruowei et al., 2008). Previous studies in Lebanon, Bangladesh, Pakistan, Cameroon, and Indonesia showed that Muslim mothers had local cultural beliefs related to breastfeeding. Lebanese mothers perceived that breastfeeding potentially harmed the infant, such as causing abdominal cramps in infants. They also believed that genetic factors caused the inability to produce breast milk and also produced unqualified breast milk. These beliefs led them to provide supplementary foods or water besides breast milk (Osman, El Zein, & Wick, 2009).

Similarly, Bangladeshi mothers have a cultural belief that terminating the exclusive breastfeeding may prevent an infant from being sick. Breastfeeding may be stopped just for a short time or permanently. Furthermore, these mothers perceived that breast milk was poisonous to the infants when they are sick, fussy, and reluctant to suck their mother's breast (Mull, 2002). In addition, mothers in Pakistan perceived that breast milk can be either a feeding source or damaging source. They thought that breast milk can carry a dead person's spirit or possess a black shadow, evil eye or black magic sent by envious people which then can cause sickness/infection in their infants. Pakistani mothers believe that the "bad breast milk" causes a new pregnancy, mother's illness or 'weakness', excessive cold or heat weather, and affects the mother's diet (Mull, 1992). According to Kakute et al. (2005), all women in Cameroon introduced water and food supplementation to their infants prior to six months of age; more than 38 percent of these infants were given water during the first month of life. These practices were done as an adherence to their cultural beliefs.

A phenomenology study (Rejeki, 2008) showed that cultural beliefs affected an infant's feeding practice among Indonesian mothers who live on Java Island. Early breastfeeding supplementation was common and accepted universally in the Javanese community. Mothers provide supplementary foods from the first week of an infant's life (Rejeki, 2008). The most common supplementary foods were banana, rice porridge (Rejeki, 2008; Waryani, 2004), ground rice, papaya, biscuits (Waryani, 2004), honey, and water (Media, Kasnodihardjo, Rachmalina, Prasodjo, & Manalu, 2005).

Javanese mothers also believe that mothers should either eat some foods or omit some foods during lactation (Waryani, 2004). Javanese mothers were encouraged to eat vegetables such as papaya leaves, cassava leaves, cinnamon leaves, kale, spinach, cabbage, carrots, beans, peas, squash, cabbage, eggplant, melinjo leaves, velvet leaves, and sprouts. While breastfeeding, mothers were encouraged to eat tofu and tempeh (Indonesian food from soy beans). Mothers also have to avoid some kinds of foods such as spicy food, smelly food such as meat and eggs, and foods containing vegetable oil (Waryani, 2004).

Javanese culture has several taboo behaviors during a lactating period (Suryawati, 2007). Javanese mothers were prohibited from washing their hair, taking a nap, going outside the home during the 35 days of postpartum, having intercourse, crossing the legs, and eating soft foods. Mothers who attend a funeral or go outside the home were discouraged to breastfeed the infant when mothers just arrived at home. Mothers should wash their hands, wash their breasts, and discard a little bit of breast milk. Then, the mothers can breastfeed the infant (Suryawati, 2007). Another qualitative study (Manurung, 2009) explored the cultural beliefs and practices during

the postpartum period among Javanese mothers who lived in Medan, North Sumatra. Postpartum mothers should take a bath and flush a small amount of water on their hair ("wuwung") every morning to increase the breast milk production, drink herbal water ("jamu") to make the breast milk smell good and have a high supply, and have a breast massage by a traditional birth attendant to prevent engorgement and increase breast milk production. There was no significant difference of cultural beliefs related to an infant's feeding between Javanese women who lived in Java Island and those who had migrated to North Sumatra Province (Manurung, 2009). Javanese mothers who migrated to Sumatra Island still strongly upheld the culture beliefs of infant feedings (Manurung, 2009).

Besides the local cultural beliefs, grandmothers play an important role in breastfeeding practices among Muslim population. The study findings in Northern Malawi were similar to the findings in Turkey which stated that the women's mothers and mothers-in-law (Err et al., 2008; Gec-kil, Sahin, & Emel, 2009) have a powerful role in the decisions of an infant's feeding. They usually encouraged such practices during postpartum as culture beliefs. The most popular practice among new mothers was eating a kind of dessert, called 'Bulamac' (82.8 percent). Nearly half of the women (45.4 percent) fed their babies with water containing sugar just after the birth. This practice is strongly encouraged by the mother-in-law as a method of feeding an infant because Muslim mothers usually stay with her husband's parents and they have to respect the mother-in-law's suggestions (M. Z. Khan, 2008).

The influence of culture beliefs and the paternal grandmother on the methods of feeding an infant was also found in Indonesia. A study among Nias mothers found that almost all of infants (94 percent) were breastfed. However, 74 percent of the

infants received supplementary liquids during the first week of an infant's life and 79 percent of the infants received complementary foods before six months of age. The paternal grandmother's pressure and local culture beliefs were the strongest factors affecting the infant feeding practices among Nias mothers (Inayati et al., 2012).

In conclusion, specific religious and culture beliefs influence individual preferences related to health behavior. The factors associated with breastfeeding among mothers may be different across religious and culture beliefs. It was interesting to find the predictive factors on breastfeeding among Muslim mothers, particularly of lactating working mothers.

Breastfeeding among Working Muslim Mothers

Similar to working mothers in other countries, working Indonesian mothers have to take several roles in their daily lives. A phenomenological study among Javanese, working Indonesian mothers (Rejeki, 2008) revealed that working mothers should keep a balance between job duties and the maternal role. The participants expressed their feelings that they experienced a dilemma because they should return to work immediately after a short maternity leave and they had to leave the infant at home (Rejeki, 2008). Working Javanese mothers reported that family support, workplace support, breastfeeding knowledge, and motivation to EBF influenced a longer EBF duration (Rejeki, 2008). Participants also mentioned that they put the infant in a child care center near the workplace because mothers could breastfeed the infant directly during work hours. Other participants who pumped the breast milk in the workplace had their family members help them feed the infant while the mothers were working outside the home. This study also found that cultural beliefs and

breastfeeding problems were reported by the participants as the major causes of a short EBF duration.

A qualitative study regarding exclusive breastfeeding practice among working Indonesian mothers was conducted by Aisyah (2009). The objectives of this study were to explore the exclusive breastfeeding practice among working mothers and the influencing factors of the exclusive breastfeeding practice among them. This study found that almost no participants breastfed their infants exclusively. The participants mentioned that they did not practice early breastfeeding initiation within the first hour after delivery. Infants were given formula milk by the health provider just after birth at the hospital. These mothers had low motivation to breastfeed their infants at the break hour. They provided formula milk to the infant's caregiver, gave complementary food to the infant before six months of age as adherence to cultural beliefs, had a lack of health provider support, and perceived insufficient milk supply (Aisyah, 2009).

The previous qualitative studies above were supported by other quantitative studies. A descriptive study among working Indonesian mothers was aimed to find factors that influence a working mother's motivation to provide exclusive breastfeeding (Lestari, Trisyani, & Widiasih, 2012). This study used the self-determination theory as the research framework. This study revealed an extrinsic factor that predominantly influenced a mother's motivation. Values, faith, and beliefs were the most influencing factors of a working mother's motivation to breastfeed exclusively (Lestari, Trisyani, & Widiasih, 2012). Another correlated study found that breastfeeding knowledge (r = .73, p = .03) and attitude toward breastfeeding (r = .68,

p = .001) had a positive correlation with exclusive breastfeeding duration among working mothers in Indonesia (Faishal & Rahayu, 2008). A regression study was conducted in Central Java Province to examine the predictors of breastfeeding duration among working mothers by Farah (2004). This study found that the predictors of breastfeeding duration among working mothers were age (β = .24, p < .05), education level (β = .87, p < .05), family income (β = .001, p < .05), fatigue (β = -.14, p < .05), and nutritional status (β = .03, p < .05) (Farah, 2004). Another cross-sectional study in Malaysia found that half of working Malaysian mothers did not practice breastfeeding after three months after delivery. The influencing factor of non-EBF practice among working Malaysian mothers was the inadequacy of breast milk pumping facilities at the workplace (*OR* = 1.80, 95%*CI* = 1.05 - 3.10) (R. M. Amin et al., 2011).

Factors Associated with Breastfeeding and the Relationships among Factors

A literature review found that some factors influence breastfeeding. There were two types of factors that influenced breastfeeding: non-modifiable factors and modifiable factors. The non-modifiable factors and the modifiable factors are presented as follows.

Non-Modifiable Factors

The non-modifiable factors include maternal characteristics and infant characteristics. Each characteristic was reviewed as follows.

Maternal personal characteristics. The evidence supports the correlation between personal characteristics and breastfeeding. A mother's personal characteristic factors were age, parity, education, type of delivery, ethnicity, marital status, income, working types, and maternity leave. The combination of all these factors correlated with or predicted a working mother's intention to exclusive breastfeeding, breastfeeding initiation, and breastfeeding duration.

Age. Maternal age when giving birth significantly influenced an infant's feeding duration. Evidence supports age as the major factor influencing the intention, initiation to breastfeeding, and duration. Younger mothers were less likely to perform EBF than older mothers (Hatton et al., 2005; Hauck et al., 2011). A literature review which aimed to evaluate factors influencing breastfeeding initiation and duration among Western mothers showed that maternal age significantly predicted intention to breastfeeding and duration (J. A. Scott & Binns, 1999), and breastfeeding initiation (Hauck et al., 2011).

Mothers who were more than 25 years old more likely to provide the EBF compared to those who were less than 25 years old (Millar & Maclean, 2005). A study in East and South East Asia found that the EBF was practiced less by younger mothers compared to older mothers (Tarkka et al., 2001). The older mothers in the United States, Europe, Australia and Canada were also more likely to practice breastfeeding (Callen & Pinelli, 2004). A recent longitudinal study in Canada found that younger mothers were more likely to practice mixed breastfeeding for infant's below six months of age (Kehler et al., 2009).

Furthermore, a study in Australia reported that the breastfeeding initiation rate in the first day after delivery among younger mothers was lower than older mothers and the EBF duration among younger mothers was also shorter compared to older mothers (Hauck et al., 2011). Maternal age was also a significant predictor of breastfeeding initiation among American mothers (*OR* = 1.01, 95%*CI* = 0.98 - 1.04) (Celi et al., 2005) and Saudi Arabian mothers (β = .56, p < .01) (T. Amin et al., 2011). The older mothers also had a higher intention to breastfeeding their infants (r = .12, p < .01) (Humphreys, Thompson, & Miner, 2002). On the contrary, a study among Syrian mothers showed that mothers younger than 25 had a higher intention to exclusive breastfeeding than older mothers (*OR* = 1.70, 95%*CI* = 1.03 - 2.67) (Al-Akour et al., 2010).

Parity. Prior studies reported that parity influenced intention to exclusive breastfeeding (Dharmawan, 2005), breastfeeding initiation (J. A. Scott & Binns, 1999), and breastfeeding duration (Bertini, 2003; Hauk, Fenwick, Dhaliwal, & Butt, 2011; Scott & Binns, 1999). A study with a large sample size (n = 2174) in Italy also found that a lower breastfeeding rate was significantly correlated with parity (Bertini, 2003). Primiparous mothers had a shorter breastfeeding duration compared to multiparous mothers (Bertini, 2003). A recent study in East and South East Asian countries revealed that mothers who gave birth for the first time were more likely to not breastfeed their infants during the first six months (Tarkka et al., 2001). A cross sectional study in Western Australia revealed that multiparous mothers have a higher intention to exclusive breastfeeding, greater rates for breastfeeding initiation, and longer durations of EBF practice than primiparous mothers (Hauk, Fenwick, Dhaliwal, & Butt, 2011). A study was conducted among more than five thousand

mothers in Canada. Parity predicted exclusive breastfeeding practice (*OR* = 1.16, 95%*CI* = 1.09 - 1.23) (Al-Sahab et al., 2010). Multiparous mothers also had a higher intention to breastfeeding their infants on the first day after delivery than primiparous mothers (*OR* = 3.16, 95%CI = 1.51- 6.62) (Mitra et al., 2004).

Education. Maternal education level influences child and family health. Maternal education level was identified as a significant predictor of exclusive breastfeeding duration (Dubois & Girard, 2003), intention to breastfeeding (Humphreys et al., 2002), breastfeeding initiation (Celi et al., 2005; L. Li et al., 2004) and breastfeeding duration (Bertini et al., 2003; Ever-Hadani, Seidman, Manor, & Harlap, 1994; L. Li et al., 2004; Millar & Maclean, 2005). A literature review conducted by Scott and Binns (1999) reported that maternal education level significantly and consistently predisposed breastfeeding initiation and duration. A study in Perth, Australia also supported the evidence that maternal educational level significantly predicted breastfeeding initiation and duration (J.A. Scott, Aitkin, Binns, & Aroni, 1999). Higher educated mothers had longer durations of breastfeeding practice (Callen & Pinelli, 2004). A higher the level of maternal education resulted in longer breastfeeding durations (p = .04) (Riva et al., 2007). Additional supporting previous evidence showed that higher educated Saudi Arabian mothers tended to breastfeed exclusively longer compared to lower educated mothers (El-Gilany, Shady, & Helal, 2011).

In contrast to the findings in some Asian countries, the education level of mothers in Africa and Canada had a negative relationship on the breastfeeding duration. A study in East and South East Asian countries provided information that low educated mothers were less likely to perform EBF (Tarkka et al., 2001). In

Canada, mothers who studied until a post secondary school level were more likely to provide EBF than mothers who studied lower than a post secondary level (*OR* = 3.5, 95%*CI* = 2.17 - 4.29) (Millar & Maclean, 2005). Similarly, lower educated mothers in Indonesia also breastfed their infants less exclusively compared to higher educated mothers (χ^2 = 12.399, *p* = .002) (Berlian, 2010). Another study in Nigeria revealed that the majority of mothers with a higher education level had a shorter exclusive breastfeeding duration compared to mothers with lower education level and did not work (Davies-Adetugbo & Ojofeitimi, 1996). This study highlighted maternal educational level as an influence on breastfeeding duration because the higher educated mothers were more likely to work outside the home, hence they would give food and water supplements to their infants instead of breast milk only.

Previous studies also showed that education level influenced intention to breastfeeding. A study found that a higher maternal education was positively associated with a greater intention to breastfeeding (*r* = .22, *p* < .01) (Humphreys et al., 2002). In contrast, a study showed that lower educated Jordanian mothers had a greater intention to breastfeeding their infants compared to higher educated mothers (*OR* = 2.90, 95%*CI* = 1.17 - 7.11) (Akour et al., 2010). The correlation between the level of education and intention to breastfeeding was inconsistent.

Evidence showed that the education level had a significant correlation with breastfeeding initiation. A higher level of maternal education was positively associated with breastfeeding initiation (*OR* = 3.04; 95%*CI* = 1.36 - 6.80) (L. Li et al., 2004). Mothers who had a higher education level produced a greater breastfeeding initiation compared with lower educational mothers (Celi et al., 2005). Maternal

education also contributed as the predictor of breastfeeding initiation among American mothers (*OR* = 6.10, 95%*CI* = 3.60 - 10.3) (Celi et al., 2005).

Type of delivery. Medical developments allow the delivery process using a cesarean section. However, WHO (1985) recommended that the cesarean section delivery rate should be only 15 percent per year in all countries around the word. However, the number of cesarean section operations in developing countries has increased significantly (H. Khan, 2004; Stanton & Holtz, 2006). Cesarean section was significantly associated with non-EBF practice because mothers who gave birth via cesarean section were more likely to delay breastfeeding initiation (Ever-Hadani et al., 1994; Rowe-Murray & Fisher, 2002; Wang, Zhou, Zhu, Gao, & Gao, 2006), have a short EBF duration (Jahangeer, Khan, & Khan, 2009), and have a short breastfeeding duration (J. A. Scott & Binns, 1999).

The breastfeeding initiation among mothers who gave birth via cesarean section and vaginal delivery were different. The median breastfeeding initiation times after delivery among mothers who delivered via cesarean section and vaginal delivery mothers were 12 hours and 2 hours, respectively. Mothers who delivered vaginally were more likely to initiate breastfeed early compared to cesarean mothers (*OR* = 12.76, 95%CI = 1.06 – 154.08) (Romero-Gwynn & Carias, 1989). A study in China found that post-cesarean mothers were less likely to perform EBF (35.8 percent in the urban and 59.6 percent in the suburbs) than vaginal delivery mothers before discharge from the hospital (45 percent in the urban and 74.4 percent in the suburbs). After six months of follow-up, this study also revealed that post-cesarean mothers living in the urban areas had a lower EBF practice than post-cesarean mothers living in the suburban areas (Qiu, Binns, Zhao, Lee, & Xie, 2008).

Types of delivery also affected breastfeeding duration. Post-cesarean mothers had shorter durations of breastfeeding at 12 first months after delivery (*RR* = 1.21, 95%*CI* = 1.10 - 1.33) (Wang et al., 2006). Vaginal delivery mothers had significantly longer duration of EBF compared to cesarean mothers (β = .45, p < .5) (Semenic, Loiselle, & Gottlieb, 2008).

Ethnicity. Several previous studies have shown that ethnicity influenced breastfeeding practice. A systematic review reported that breastfeeding initiation and duration varied across race (Dennis, 2006). A study in Massachusetts revealed that ethnicity was significantly correlated to breastfeeding initiation (Celi et al., 2005). South-Asian mothers were more likely to breastfeed their infants than white British mothers (Bai, Wunderlich, & Fly, 2011). Another study was conducted to assess predictors of EBF practice among non-Hispanic African American, non-Hispanic white, and Hispanic/Latina mothers. This study revealed that the most significant predictor of EBF varied in each ethnicity (Bai, et al., 2011). The most significant predictor of EBF practice among non-Hispanic African American was subjective norm whereas that of non-Hispanic white mothers was attitude toward breastfeeding and that of Hispanic/Latina mothers was perceived behavioral control (Bai, et al., 2011).

There were significant differences of breastfeeding initiation and breastfeeding duration across ethnicity. Mothers who migrated to the United States had a higher rate of breastfeeding initiation and longer duration of breastfeeding compared to American mothers (Singh, Kogan, & Dee, 2007). Similarly, immigrant mothers who were born out side the United States were more likely to initiate breastfeeding than mothers born in the United States (*OR* = 3.20, 95%*CI* = 2.00 - 5.20) (Celi et al., 2005). Moreover, a

study in Malaysia found that Indian mothers (*OR* = 4.06, 95%*CI* = 2.41 - 6.84) and Chinese mothers (*OR* = 1.75, 95%*CI* = 0.89 - 3.46) had shorter breastfeeding durations compared to Malaysian mothers (Tan, 2009).

Ethnicity also predicted intention to breastfeeding. A study in California found that migrated mothers from Mexico had a greater intention to breastfeeding compared to Hispanic mothers born in the United States. This study highlighted ethnicity as a significant predictor of intention to breastfeeding (*OR* = 8.54, 95%*CI* = 1.17 - 62.05) (Romero-Gwynn & Carias, 1989). In addition, ethnicity was the only significant predictor of intention to breastfeeding among Black mothers (born outside the United States). Black immigrant mothers had a higher intention to breastfeeding compared to white mothers (born in the United States) (Bonuck, Freeman, & Trombley, 2005). In contrast, another study among low income mothers in Mississippi revealed that White Hispanic mothers were more likely to have a higher intention to breastfeeding compared to African Americans and other ethnicities ($p < .01$) (Mitra et al., 2004). The ability of ethnicity to predict the breastfeeding duration in the previous study results was inconsistent.

Marital status. Pregnancy can occur both in married and unmarried women. Evidence showed that marital status influenced breastfeeding practice. Married mothers were more likely to breastfeed than unmarried mothers (P. D. Hill & Aldag, 1998). A review of the articles which came from Canada, Europe, the United States and Australia found that married mothers were more likely to initiate breastfeeding (Celi et al., 2005), had higher intention to exclusive breastfeeding (Al-Sahab et al., 2010), and had longer durations of breastfeeding than unmarried mothers (Callen & Pinelli, 2004). Married mothers in Canada were more likely to initiated breastfeeding

with their infants (*OR* = 1.30, 95%*CI* = 0.70 - 2.30) (Celi et al., 2005) and with longer breastfeeding durations (*OR* = 1.61, 95%*CI* = 1.03 - 2.52) (Al-Sahab et al., 2010) compared to unmarried mothers. On the other hand, single status had a negative correlation with intention to breastfeed (r = -.20, p < .01) (Humphreys et al., 2002).

Income. Family income significantly influenced breastfeeding practice. Working mothers who had a high family income were more likely to initiate breastfeeding (Mandal et al., 2010). A literature review from studies which were conducted in Canada, Europe, the United States and Australia showed that mothers who had higher family incomes were more likely to practice breastfeeding than mothers who had lower family incomes (Callen & Pinelli, 2004). Another study in Italy found that breastfeeding initiation was practiced more often among mothers who had a higher household income than mothers who had a lower household income (Riva et al., 2007). Household income also influenced the EBF practice when mothers were discharged from a hospital (*OR* = 1.08, 95%*CI* = 1.07 - 1.10) (McDonald et al., 2012). The influence of family income on breastfeeding practice was inconsistent. Surprisingly, Indonesian mothers with a high family income were more likely not to perform EBF compared to a low family and middle family income mothers (χ^2 = 16.590, p < .01) (Berlian, 2010).

Family income predicted intention to breastfeeding and breastfeeding initiation in both developed and developing countries. Family wealth significantly influenced breastfeeding initiation (Celi et al., 2005). A higher family income produced a greater breastfeeding initiation rate (*OR* = 2.40, 95%*CI* = 1.20 - 4.80) (Celi et al., 2005). Similar evidence been found also in the United States and Singapore where family income was a significant predictor of breastfeeding initiation among American mothers (Celi et al., 2005) and Singaporean mothers (Ong et al.,

2005). Household income influenced Syrian mothers' intention to breastfeeding. Mothers who had a higher family income had a higher intention to breastfeeding their infants compared to mothers who had a low family income (*OR* = 1.80, 95%*CI* = 1.15 - 2.68) (Khoury et al., 2005).

Working types. The number of working hours influenced breastfeeding practice among working mothers. A systematic review (Dennis, 2006) found that full-time working mothers were less likely to breastfeed than part-time working mothers. Shorter working hours increases breastfeeding initiation and duration among working mothers in the United States (Mandal et al., 2010). Part-time physician mothers had greater durations of breastfeeding compared to full-time physician mothers (Arthur, Saenz, & Replogle, 2003). Another study among working Malaysian mothers (R. M. Amin et al., 2011) showed that part-time mothers breastfed for longer durations (*OR* = 2.16, 95%*CI* = 0.53 - 8.82) compared to full-time working mothers.

Maternity leave. Every working mother has maternity leave immediately after delivery. The duration of maternity leave varies among countries. Evidence showed that the relationship between breastfeeding duration and the length of maternity leave was positive. The length of maternity leave was significantly associated with breastfeeding duration among working mothers ($\beta = 1.85$, $p < .05$) (Jahangeer et al., 2009). The maternity leave duration also influenced breastfeeding duration significantly among Malaysian mothers (*OR* = 5.20, 95%*CI* = 1.70 - 15.90) (R. M. Amin et al., 2011). A longer duration of maternity leave produced a longer duration of breastfeeding practice among physician mothers (Arthur et al., 2003).

Infant characteristics. Evidence showed that infants' characteristics influenced breastfeeding duration. The infants' characteristics that influenced breastfeeding duration were age (McDonald et al., 2012), age when mothers returned to work (J. A. Scott et al., 2006), Apgar score, resuscitation status (McDonald et al., 2012), and age when the infant started using a pacifier (J. A. Scott et al., 2006). Mothers who delivered preterm infants were less likely to breastfeed exclusively compared to mothers who delivered term infants (*OR* = 1.17, 95%*CI* = 1.13 - 1.21) (McDonald et al., 2012). The age of the infant when mothers returned to work and the age when the infant started using a pacifier also predicted breastfeeding duration (*OR* = 1.92, 95%*CI* = 1.39 - 2.64) (J. A. Scott et al., 2006). A higher infant Apgar score (*OR* = 1.07, 95%*CI* = 1.04 - 1.10) and a stable, non-resuscitated condition after birth (*OR* = 1.07, 95%*CI* = 1.03 - 1.12) increased the exclusive breastfeeding practice (McDonald et al., 2012).

The Modifiable Factors

The modifiable factors include breastfeeding knowledge, breastfeeding support, attitude toward breastfeeding, breastfeeding problems, sufficient milk supply, maternal weight, smoking status, timing of infant feeding decision, breastfeeding subjective norm, perceived breastfeeding control, postpartum depressive symptoms, Baby Friendly Hospital Initiative policy, maternal confidence, breastfeeding initiation, and intention to breastfeeding. The modifiable factors are presented as follows.

Breastfeeding knowledge. Sufficient and appropriate knowledge about breastfeeding influenced intention to breastfeeding and duration. A higher level of breastfeeding knowledge will cause a stronger intention to breastfeeding among low income mothers (Mitra et al., 2004). Breastfeeding knowledge also had a significant correlation with breastfeeding duration (Chezem et al., 2006). In Thai adolescent mothers, breastfeeding knowledge was the predictor of breastfeeding practice at four weeks after delivery (Ratananugool, 2001).

Evidence showed that sufficient knowledge about breastfeeding influenced a mother's intention to breastfeeding and actual breastfeeding duration. A study (Ratananugool, 2001) found that breastfeeding knowledge correlated with intention to breastfeeding ($r = .17$, $p < .05$) and breastfeeding duration ($\beta = .33$, $p < .01$). A higher level of breastfeeding knowledge also produced a higher intention to breastfeeding ($\beta = .39$, $p < .05$) (Mitra et al., 2004). Breastfeeding knowledge significantly influenced breastfeeding initiation ($\beta = .18$, $p < .05$) (Gijsbers et al., 2006).

Breastfeeding support. Lactating mothers who get support from their significant others will have a greater intention to breastfeeding their infants, are more likely to initiate breastfeeding, and will conduct longer breastfeeding duration. The sources of support were family, health professionals, and the workplace.

Family support**.** Greater support from the husband and other family members produced a longer duration of breastfeeding (Dennis, 2006). In Thai adolescent mothers, perceived support from family member was a significant predictor of breastfeeding at three months after delivery (Ratananugool, 2001). Perceived support had a significant correlation with breastfeeding at three months ($r = .56$, $p < .05$) (Ratananugool, 2001). A study in Bangladesh also found that family support was

significantly correlated with exclusive breastfeeding duration ($r = .90$, $p < .01$) (Biswas, 2010). Support from family members was also positively correlated with intention to breastfeeding and breastfeeding initiation. Perceived family support affected intention to breastfeeding (*OR* = 1.56, 95%*CI* = 1.27 – 1.92) (Mitra et al., 2004). Another study also found that there was a correlation between family support and intention to breastfeeding ($r = .13$, $p < .05$) (Humphreys et al., 2002). Syrian mothers who were supported by their husbands had a higher intention to breastfeeding than mothers who did not receive support (*OR* = 2.30, 95%*CI* = 1.06 – 5.11) and Jordanian mothers also had higher intention to breastfeeding when supported by their husbands (*OR* = 2.20, 95%*CI* = 1.47 – 3.33) (Al-Akour et al., 2010). Paternal support was the major factor that influenced breastfeeding initiation among Australian mothers (L. Li et al., 2004; J. A. Scott & Binns, 1999). The father's support for breastfeeding also positively influenced breastfeeding initiation of Chinese mothers giving birth in Australia (*OR* = 4.96; 95%*CI* = 1.93 – 12.66) (L. Li et al., 2004).

Health professional support. Support from health providers also influenced breastfeeding initiation (L. Li et al., 2004). A cross-sectional study evaluated the initiation of breastfeeding by Chinese Australian mothers. This study included 506 Chinese women in Perth, Western Australia. Support from health providers predicted breastfeeding initiation of Chinese mothers who gave birth in the origin countries (*OR* = 9.94; 95%*CI* = 3.17 – 31.18) and in Australia (*OR* = 16.78; 95%*CI* = 7.12 – 39.55).

Workplace support. Breastfeeding continuation among lactating working mothers decreases significantly after mothers returned to work (Chuang et al., 2010). Because of the mother-infant separation during work, mothers cannot breastfeed their

infants directly from the breast. A literature review found that workplace breastfeeding support included enlightening breastfeeding management of lactating working mothers; promoting the benefits of breastfeeding for mothers, infants, and workplace; providing breastfeeding support facilities for lactating mothers (e.g., a private room, a child care center near the workplace, breast pumping, and breast milk storage facilities); allowing flexible work time for lactating working mothers; and developing breastfeeding support policies at the workplace (Hirani & Karmaliani, 2012). Similarly, another literature review also revealed that supportive work environments and the availability of breast pumping facilities at the workplace significantly influenced breastfeeding duration among lactating working mothers (Johnston & Esposito, 2007).

Working mothers need a special space and time for breast milk expression at the workplace. According to Ortiz, McGilligan, and Kelly (2004), the availability of breast milk pumping facilities at the working place supported breastfeeding practice among working mothers. Ninety-seven percent of working mothers in this study initiated breastfeeding during the first day after delivery and had longer breastfeeding durations compared to lactating working mothers who did not pump the breast milk during work hours (Ortiz et al., 2004). Moreover, breast milk pumping facilities in the workplace increased female job satisfaction and they had greater commitment to their job. This study highlighted that the presence of breast milk pumping facilities in the workplace encouraged lactating working mothers to provide EBF up to six months. This study also revealed that the policy maker should consider a breast milk pumping facility policy in every office as one of the support programs for breastfeeding at the workplace (Mensah, 2011).

Workplace support significantly influences overall breastfeeding and EBF duration among working mothers. Breastfeeding duration among working mothers was significantly influenced by the availability of breast pumping facilities in the office (*OR* = 1.80, 95%*CI* = 1.05 – 3.10) (Mensah, 2011). The availability of breast pumping facilities in the workplace also significantly affected breastfeeding duration among female employees in the WIC program ($p < .05$) (Whaley, Meehan, Lange, Slusser, & Jenks, 2002). Similarly, another study in Malaysia included 290 lactating working mothers and half of these mothers had short breastfeeding durations. This study found that a lack of breastfeeding support in the workplace also made working mothers have a shorter duration of breastfeeding and working mothers were more likely to have shorter durations of breastfeeding (*OR* = 1.80, 95%*CI* = 1.05-3.10) (R. M. Amin et al., 2011).

Attitude toward breastfeeding. According to Ajzen (1991), an individual's positive attitude toward a specific behavior produces the intention to carry out the given behavior. Behavioral beliefs are perceived toward the outcome of the behavior and together with evaluation of the outcome; they construct the attitude toward behavior. A positive attitude toward behavior will induce people to perform behavior and negative attitude toward behavior will obstruct peoples' intention to perform behavior.

Evidence from Bangladesh, Indonesia, America, Thailand, Hong Kong, and Nigeria supported the previously mentioned attitude toward behavior. A cross sectional study among Muslim mothers in Bangladesh revealed that attitude could predict intention to exclusive breastfeeding ($\beta = .52$, $p < .05$). This study collected the data using a questionnaire developed by the researchers based on the theory of

reasoned action (TRA) as a research framework (S. Khatun, 2010). Another study in Indonesia (Nasution, 2013) reported that attitude toward EBF significantly predicted EBF duration.

A study among American mothers found that attitude (β = .36, p < .05) was a significant predictor of intention to breastfeeding. Another study (Bai et al., 2011) in the United States supported the previous study. This study aimed to examine the predictors of EBF duration and included 78 mothers. This study used TPB as a research framework. Data was collected using theory-based constructed questionnaires and they followed up using a phone-interview up to six months after delivery. Then, the data were analyzed using multiple regressions to find predictors of intention to breastfeeding and duration. These data indicated that attitude significantly influenced intention to breastfeeding (β = .36, p < .05) (Bai et al., 2011). In Hong Kong, attitude had a positive effect on breastfeeding duration through intention (Dodgson et al., 2003).

Almost all of previous studies examined the predictors of intention to breastfeeding and duration among adult mothers. The predictors of intention to breastfeeding and duration might be different between adult and adolescent mothers, due to the developmental level. A longitudinal study of Thai adolescent mothers (Ratananugool, 2001) examined their intention to breastfeeding and the breastfeeding practice at four weeks and three months postpartum. The sequential data analysis revealed that Thai adolescent mothers intention to breastfeeding could be predicted by positive attitude toward breastfeeding (β = .17, p < .05) and negative attitude toward breastfeeding (β = -.15, p < .05).

The predictive ability of attitude toward breastfeeding on intention to exclusive breastfeeding was inconsistent. A study among 88 low income pregnant and breastfeeding mothers in the United States showed that attitude toward breastfeeding could not predict the intention to breastfeeding (G. J. Hill, Arnett, & Mauk, 2008). They argued that the significant others' perception affected the mothers' intention to breastfeeding more than their own attitude toward breastfeeding.

The antecedent factors of attitude toward EBF among working mothers were evaluated in Nigeria (Ekanem, Ekanem, Asuqo, & Eyo, 2012). This study showed that several factors influenced attitude toward EBF among working mothers, which included maternal age, profession types, marital status, educational level, health status, socioeconomic status, attendance at antenatal clinics, number of children, miscellaneous opinions relate to EBF in an ethnic group, and religious conviction.

Culture predisposes how people live in a society, how to act, experience, and view life and relate to each other. Individual culture, health beliefs, and behaviors were different among ethnicities (Bonuck et al., 2005). Cultural knowledge guides nurses to provide sensitive cultural care (Lowe & Archibald, 2009). Some cultural beliefs encourage breastfeeding practice; however, some culture beliefs discourage EBF duration (Reifsnider et al., 2003). A qualitative study in Indonesia (Rejeki, 2008) revealed that Indonesian mothers provided supplementary food or water to the infants before six months of age because of cultural beliefs in the society and the influence of a mother-in-law. Javanese mothers gave banana or rice porridge as supplementary food besides breast milk during the first month of the infant's life (Rejeki, 2008). These traditional beliefs affect breastfeeding initiation and duration. Javanese mothers who migrated to other provinces maintained the original culture beliefs during the

postpartum period. They drank “jamu”, practiced “wuwung”, massaged the breast, avoided some foods, and complied with various restrictions during the breastfeeding period (Manurung, 2010).

Besides cultural beliefs, religious beliefs affect individual health beliefs and behavior because every religion has unique values. Individual positive beliefs and adherence to religious values related to health behavior increase the involvement in health related behavior (Lindaman & McAthie, 1999). A cohort study was conducted to evaluate breastfeeding duration among Muslim mothers in Israel. This study randomly recruited 429 mothers who were interviewed at three and six months after delivery. This study revealed that 96 percent of the mothers initiated breastfeeding; however, only 57 percent of mothers still breastfed up to six months after delivery. Religiosity was the most significant predictor of breastfeeding duration of more than six months. Mothers who had high religiosity were twice as likely to breastfeed their baby longer than mothers who had low religiosity (Azaiza & Palti, 1997).

Breastfeeding problems. Breastfeeding is a natural behavior to feed the infant. However, mothers reported some difficulties during the breastfeeding period and these difficulties influenced the mothers' perceptions of their breastfeeding experiences. Breastfeeding problems were indicated as the major barrier to maintain breastfeeding. Most of the mothers did not practice exclusive breastfeeding after delivery because they perceived breastfeeding problems rather than due to maternal choice (Dennis, 2006).

A literature review found that breastfeeding problems had a negative impact on breastfeeding practice. Breastfeeding problems which occurred during four months postpartum significantly influenced breastfeeding duration (*OR* = 1.75, 95%*CI* = 1.35

– 2.23) (J. A. Scott et al., 2006). In addition, Wojcicki et al. (2010) found that the only predictor of a short EBF duration in the postpartum period was pain and discomfort during breastfeeding (*OR* = 1.41, 95%*CI* = 1.06 – 1.89). In Thai adolescent mothers, the presence of breastfeeding problems was the predictor of breastfeeding duration at four weeks and three months after delivery (Ratananugool, 2001).

The onset and types of breastfeeding problems were varied. A study found that 76.9 percent of breastfeeding problems occurred in the first week of life, 7.7 percent in the second week and 15.4 percent in the third week, respectively (Khassawneh et al., 2006). Twenty-three percent of mothers had other problems like sore nipples, mastitis, breast engorgement, breast abscess, and other illness problems (Khassawneh et al., 2006). A study in Australia found that sore nipple was the major breastfeeding difficulty (*OR* = 15.60, 95%*CI* = 4.39 – 61.55) (J. A. Scott et al., 2006). A study among Nigerian mothers showed that non-exclusive breastfeeding was influenced by breastfeeding problems, such as sore nipples (23 percent), pain during breastfeeding (31 percent), and being too tired to wake up in the night (28 percent) although they had the intention to exclusive breastfeeding (Agunbiade & Ogunleye, 2012).

The majority of breastfeeding problems occur because of ineffective emptying of milk from the breast. The breastfeeding problems such as breast engorgement, plugged milk duct, sore nipples, breast infection, candidiasis, mastitis, breast abscess, galactocele, and insufficient milk supply are preventable. The major causes of several breastfeeding problems are incorrect breastfeeding techniques, infrequent breastfeeding frequency, and breastfeeding on a scheduled time, pacifier use, and providing complementary food before six months. Health providers have an important role to prevent breastfeeding problems. To prevent breastfeeding problems, mothers

should be educated to breastfeed on infant's demand, they should know the correct breastfeeding technique, avoid using a pacifier to give breast milk or formula feeding, delay complementary food up to six months after the infant's birth, and continue breastfeeding when the mother experiences breast engorgement. Breast milk supply did not have a correlation with the breast size. A mother can produce sufficient milk for her baby even though the mother has a small breast size (Giugliani, 2004).

Sufficient milk supply. Physiologically, every mother produces an adequate supply of breast milk to meet the infant's need. The amount of breast milk supply is not constant during postpartum period. It is based on the infant's growth. A few days after delivery, a mother produces just small amounts of colostrum (Lawrence & Lawrence, 2011). A mother may perceive that the colostrum only is not enough to meet the infant's requirements.

Sufficient milk supply refers to the mother's perception that her breast milk supply is enough to fulfill her infant's needs. Perceived sufficient milk supply is an important factor to maintain exclusive breastfeeding duration because the most common reason of supplementing food to an infant below six months is a perceived insufficiency of breast milk supply. Insufficient milk supply is a mother's perception that her breast milk supply is not enough to fulfill her infant's need. Insufficient milk production was the strongest cause of non-exclusive breastfeeding practice and the most common reason to substitute breast milk with formula feeding among Turkish mothers (Khassawneh et al., 2006). Similar evidence from Nigeria showed that low breast milk supply was the major reason for short exclusive breastfeeding among Nigerian mothers (Davies-Adetugbo, 1997).

Perceived insufficient breast milk supply was the primary etiology of mothers to give supplementary solid food or water before six months of infant's age, especially in developing countries. Evidence showed that the majority of postpartum mothers perceived that the breast milk production could not be adequate to meet the infant's need (Blyth et al., 2002). Another study recruited 326 Bangladeshi mothers from low- and middle-income socioeconomic status who had infants between 6 and 12 months old. This study revealed that the most common reason to give food supplementation to infants was inadequate breast milk supply (62.3 percent) (Gatrell, 2007). Furthermore, Otoo et al. (2009) included 35 breastfeeding women who had at least one infant less than four months old. This study showed that mothers in Ghana know that breast milk was the best infant feeding source and they had sufficient information regarding EBF duration. However, insufficient milk supply was the most common reported problem during the breastfeeding period. Some mothers preferred to combine breast milk with another supplemental food to meet the infant's need.

During the H & H Lactation scale development, Hill and Humenick (1996) found an association between the scores of the H & H Lactation scale and breastfeeding duration. The total scale, mother's confidence/commitment, perceived infant satisfaction to breast milk, and mother-infant breastfeeding satiety scores had a significant correlation with breastfeeding duration (r = .62, .66, .48, and .53, all $p < .05$, respectively). In addition, the perception of insufficient milk supply predicted supplementary formula feeding among preterm (OR = 11.16, 95%CI = 3.18 – 39.22) (Hill & Humenick, 2007) and term (OR = 10.4, 95%CI = 3.0 – 37.6) infants at eight weeks postpartum (Hill & Humenick, 2007).

Weight. Maternal body mass index affects breastfeeding duration. There was a significant difference of breastfeeding duration between normal weight mothers and obese mothers. Obese mothers had shorter breastfeeding duration compared to normal weight mothers (Donath & Amir, 2008). After controlling other factors, a study in Australia reported that maternal weight was significantly correlated with breastfeeding duration. Pre-pregnancy overweight and obese mothers had shorter breastfeeding duration compared to pre-pregnancy normal weight mothers (R. Li, Jewell, & Grummer-Strawn, 2003; Oddy et al., 2006). Another study was conducted in the United States including 587 Hispanic mothers. This study found that obese mothers were more likely to practice non-EBF compared to normal weight mothers (*OR* = 1.90; 95%*CI* = 1.20 – 3.10). Furthermore, obese mothers had shorter EBF duration (*RR* = 1.50; 95%*CI* = 1.10 – 2.00) and also shorter overall breastfeeding duration (*RR* = 1.50; 95%*CI* = 1.10 – 2.10 (Kugyelka, Rasmussen, & Frongillo, 2004).

Maternal obesity not only influenced breastfeeding duration but also the intention to breastfeeding and breastfeeding initiation. A systematic review (Turcksin, Bel, Galjaard, & Devlieger, 2012) found that obese women had less intention to breastfeeding, were less likely to initiate breastfeeding their infants, and had shorter duration of breastfeeding compared to their normal weight counterparts. This systematic review highlighted maternal obesity as a significant factor of a short breastfeeding duration (Turcksin et al., 2012).

A descriptive study (Donath and Amir, 2008) examined the association between maternal obesity, breastfeeding initiation, and duration of breastfeeding.

This study revealed that 89.20% (95%*CI* = 87.40 – 91) of mothers with a normal body mass index (BMI) of 20 - 25 were more likely to initiate breastfeeding, compared with 82.30% (95%*CI* = 77.6 – 87) of mothers with a BMI of 30 or more. This study also found that after adjusting for other factors, there was a significant correlation between maternal weight and breastfeeding duration. Obese mothers were more likely to have a shorter duration of breastfeeding than normal weight mothers (*RR* = 1.36, 95%*CI* = 1.15 – 1.61) (Donath & Amir, 2008).

Smoking status. Smoking is well known as one of the causes of a short breastfeeding duration both in developed and developing countries (Amir, 2001; Minchin, 1991). The nicotine might reduce breast milk supply by suppressing prolactin hormone release (Amir & Donath, 2002). However, the psychosocial factors also affected breastfeeding duration among smoking mothers because some previous studies found that in some populations smoking mothers had long breastfeeding duration (Amir & Donath, 2002). The smoking rate was higher in younger mothers than older mothers (Dorea, 2007). Furthermore, Scott and Binns (1999) reported breastfeeding duration in smoking mothers was shorter than non-smoking mothers. Another study found that smoking mothers had less intention to breastfeeding their infants (Amir & Donath, 2002), delayed initiation of breastfeeding at the first day postpartum and practiced shorter duration of breastfeeding (Amir & Donath, 2002; Bailey & Wright, 2011).

Smoking status influenced maternal intention to breastfeeding and breastfeeding duration. Evidence showed that smoking affected breastfeeding both physiologically and psychologically (Amir & Donath, 2002). Smoking mothers were less likely to have intention to breastfeeding their infants (*RR* = 1.50, 95%*CI* = 0.93 – 1.90) (Barnes et al.,

1997). Another study in Malaysia also found that non-smoking mothers were more likely to breastfeed exclusively their infants compared to smoking mothers (*OR* = 7.27, 95%*CI* = 1.26 – 55.53) (Tan, 2009).

The number of cigarettes consumed per day also influenced intention to breastfeeding, initiation, and duration (Amir & Donath, 2002). Mothers who smoke 10 cigarettes per day were more likely to initiate breastfeeding compared to mothers who smoked 10 – 20 cigarettes and more than 20 cigarettes per day. The odds ratios of breastfeeding duration at six months for cigarette consumption less than 10 per day, 10 – 20 per day, and more than 20 per day were *OR* = .99, 95%CI = 0.67 – 1.45, *OR* = 1.61, 95%*CI* = 1 – 2.61, *OR* = 1.94, 95%*CI* = 1.10 – 3.39, respectively (Horta et al., 1997).

Timing of infant feeding decision. Mothers decide the infant feeding type during pregnancy. The decision to breastfeed during late pregnancy made a shorter duration of breastfeeding practice among postpartum mothers (Dennis, 2006). An early decision by the mother of infant feeding produced a greater intention to breastfeeding their infant (Ratananugool, 2001). The decision of timing of infant feeding was significantly correlated with intention to breastfeeding *(r* = .41, *p* < .01) (Ratananugool, 2001).

Breastfeeding subjective norm. Normative beliefs is defined as individual perception regarding significant others' expectation of performing or not performing a behavior. Normative beliefs and motivation to comply with the expectation will establish a subjective norm. The greater subjective norm makes people give more consideration to perform a behavior due to social pressure to perform a given

behavior (Ajzen, 1991). The correlation between subjective norm and intention to perform behavior was investigated in several previous studies.

Most studies in a breastfeeding context among American mothers found that breastfeeding subjective norm predicted intention to breastfeeding. Saunders-Goldson and Edwards (2004) examined predictors of intention to breastfeeding among working military African mothers in the United States. The study showed that subjective norm significantly predicted intention to breastfeeding ($\beta = .24$, $p < .05$) (Saunders-Goldson & Edwards, 2004).

The ability of subjective norm to predict intention to breastfeeding was also found by Bai et al. (2011), Dodgson et al. (2003), and G. J. Hill et al. (2008). Bai et al. (2011) evaluated the predictors of EBF duration among 78 mothers in the United States. The study revealed that subjective norm significantly predicted intention to breastfeeding ($\beta = .49$, $p < .05$). Similarly, a study by Dodgson et al. (2003) found that subjective norm ($\beta = .49$, $p < .05$) was a significant predictor of intention to breastfeeding among mothers in Hong Kong. This study also found that marital status affected the level of subjective norm. Married women perceived higher subjective norm than unmarried women (Dodgson et al., 2003). Another study in the United States recruited 88 low income pregnant and breastfeeding mothers. This study found that subjective norm significantly predicted intention to breastfeeding ($\beta = .57$, $p < .01$) (G. J. Hill et al., 2008).

Evidence from Scotland and Thailand supported the prediction ability of subjective norm on intention to breastfeeding; however, a study from Bangladesh provided an opposite result. A study (Swanson & Power 2005) evaluated the effect of subjective norm on intention to breastfeeding, breastfeeding initiation, and

breastfeeding continuation. This study recruited 203 Scottish mothers. The intention to breastfeeding and breastfeeding initiation data were collected at a hospital. The breastfeeding duration information was collected using a postal questionnaire at six weeks postpartum (Swanson & Power, 2005). This study revealed that subjective norm significantly influenced breastfeeding initiation and breastfeeding duration.

In a longitudinal study (Ratananugool, 2001) examined intention to breastfeeding and breastfeeding practice at four weeks after delivery among Thai adolescent mothers. The result showed that the best predictor of breastfeeding among adolescent mothers was breastfeeding subjective norm. In contrast, a study in Bangladesh found that subjective norm could not predict Intention to exclusive breastfeeding among Bangladeshi mothers (β = -.15, p > .05) (S. Khatun, 2010). There were inconsistent findings among previous studies about the capability of subjective norm to predict the exclusive breastfeeding.

Perceived breastfeeding control. Control beliefs is the availability of factors that facilitate or inhibit an individual to perform a specific behavior and the perception of individual ability to use supporting factors and overcome impeding factors (Ajzen, 2006). Empirical studies found that perceived behavioral control predicted intention to breastfeeding among American mothers (Saunders-Goldson & Edwards, 2004; Wambach, 1998) and adolescent Thai mothers (Ratananugool, 2001).

Three previous studies from America and Thailand provided evidence of the ability of perceived breastfeeding control to predict breastfeeding duration. A study by Wambach (1998) evaluated the predictors of breastfeeding duration among Kansas mothers. This study found that perceived breastfeeding control predicted intention to breastfeeding (β = .27, p < .01). Another study (Saunders-Goldson & Edwards, 2004)

examined the predictors of intention to breastfeeding among military African American women. This study recruited 95 lactating working mothers. The study revealed that perceived breastfeeding control was a statistically significant predictor of the intention to breastfeeding among military African American mothers ($\beta = .32$, $p < .05$) (Saunders-Goldson & Edwards, 2004). A longitudinal study among Thai adolescent mothers (Ratananugool, 2001) evaluated predictors of breastfeeding at three months postpartum. The best predictor of breastfeeding at three months among adolescent mothers was the perceived breastfeeding control.

Postpartum depressive symptoms. During postpartum period, a mother is at a high risk to experience depression. Postpartum depression was defined as a major depression that occurred between four weeks up to six months after delivery (Miller, 2002). Approximately thirteen percent of mothers suffered from postpartum depression (Beck, 2001). Another systematic review reported a wide range of postpartum depression. The prevalence of postpartum depression in 40 countries ranged between 0 and 60 percent (Halbreich & Karkun, 2006). Postnatal depression may cause adverse effects on both mother and infant, but its impact on breastfeeding duration is still poorly understood.

Evidence showed that postnatal depression had a significantly negative impact on EBF duration. Mothers with postpartum depression had a shorter duration of EBF compared to mothers with no depressive symptoms. A current study investigated the correlation between infant feeding and postnatal women diagnosed with depression. The respondents of this study were women diagnosed with postpartum depression at two to four weeks after delivery and the number of respondents was 122 mothers. This study found that the severity of the depression did not significantly impact infant

feeding; however, depressive mothers were more likely to prefer combination feeding rather than the exclusive breastfeeding (León-Cava et al., 2002).

Another study assessed the correlation between depressive symptoms and breastfeeding at 6 and 12 weeks postpartum. The Edinburgh Postnatal Depression Scale (EPDS) was completed by mail at six weeks postpartum and in an outpatient clinic at 12 weeks postpartum. There was an inverse relationship between depressive symptoms and breastfeeding at six weeks postpartum ($p < .001$) but not at 12 weeks. The results suggested that depressive symptoms in the early postpartum period may disturb the EBF duration (Hatton et al., 2005).

A cohort study conducted in Australia aimed to examine the correlation between postpartum depressive symptom and breastfeeding duration. This study included 1,745 women. The study found that 18 percent of respondents had a high EPDS score and 63 percent of the depressive symptoms occurred before two months after delivery. This study also found that mothers with depressive symptoms were less likely to breastfeed their infant ($aHR = 1.25$, 95%$CI = 1.03 – 1.52$) (Henderson, Evans, Straton, Priest, & Hagan, 2003).

Baby Friendly Hospital Initiative. The hospital is the first place of a human life since the majority of baby births are in a hospital. The Baby Friendly Hospital Initiative (BFHI) was announced by UNICEF in 1991 to promote early breastfeeding initiation and exclusive breastfeeding during the first few hours of an infant's life. Several studies exemplified that BFHI practice increased breastfeeding initiation, enhanced intention to breastfeeding, and prolonged the duration of EBF (Jahangeer et al., 2009).

The Baby Friendly Hospital Initiative has had a significant positive effect on intention to breastfeeding. Mothers who gave birth in a baby friendly hospital were more likely to initiate breastfeeding within the first hour after delivery (*OR* = 1.40, 95%*CI* = 1.10 - 1.90), did not give water or food to the infants (*OR* = 2.50, 95%*CI* = 1.90 - 3.20), nor were pacifiers introduced during the hospital stay (*OR* = 1.30, 95%*CI* = 1.10 - 3.10). Those study findings were associated with intention to breastfeeding. When controlling other hospital practices, this study found that no supplemental feeding in the hospital was the most significant predictor of intention to breastfeed (*OR* = 2.30, 95%*CI* = 1.80 - 3.10) (Perrine et al., 2012).

Evidence showed that the BFHI policy also affected EBF duration. A study in Turkey investigated the factors influencing EBF duration among Turkish mothers. This study recruited 91 mothers with healthy and term infants. The study found that 54 percent of mothers breastfed exclusively at four months after delivery. This study highlighted formula supplementation at a hospital as the major predictor of short exclusive breastfeeding duration compared to EBF knowledge and psychosocial factors (Alikasşifoğglu et al., 2001).

In addition, a study in Switzerland (Merten, Dratva, & Ackermann-Liebrich, 2005) selected 2,861 mothers with infant ages between 0 and 11 months. After adjusting for other factors, this study found that compliance with the BFHI policy by the health professionals enhanced the median of EBF duration. Delayed breastfeeding initiation in the hospital engendered a shorter EBF duration (*HR* = 1.20, 95%*CI* = 1.08 - 1.34) (Merten et al., 2005).

Maternal confidence. Maternal confidence in breastfeeding was defined as a mother's psychological adjustment to perform breastfeeding. Evidence showed that a lower maternal confidence to breastfeed produced a lower breastfeeding practice (Dennis, 2006). Maternal confidence significantly influenced breastfeeding duration (Chezem et al., 2006). Another researcher used the term "breastfeeding confidence" to reflect a mother's perception of their own competency to perform breastfeeding successfully using all of the knowledge and skills (Chezem et al., 2002). Maternal confidence was influenced by previous experience, experience of other women, social support, and psychological status during breastfeeding (Dennis & Faux, 1999). As a general rule, a higher maternal confidence will result in a longer duration of breastfeeding.

A prospective descriptive study (Chezem et al., 2006) evaluated the association between breastfeeding knowledge, breastfeeding confidence, infant feeding plans, and feeding practices among first-time breastfeeding mothers. The researcher collected the data by telephone interview during pregnancy, six weeks, three months, and six months postpartum. This study included 74 first-time mothers who had intentions to breastfeeding after delivery. The study revealed that maternal confidence had a significant correlation with breastfeeding practice ($r = .26$, $p < .05$) (Chezem et al., 2006).

Breastfeeding initiation. Breastfeeding initiation was defined as a mother who provided breast milk as the first and the only infant feeding source within the first hours after delivery (WHO, 2006). During this time, the baby's sucking reflex becomes most active. Early breastfeeding initiation prevents infants' life during a neonatal period (WHO, 2006). The Indonesian breastfeeding initiation rate was 44 percent (IDHS, 2007). Evidence showed that breastfeeding initiation among

American working mothers was high. A study found that the breastfeeding initiation among physician mothers was 97 percent (Sattari et al., 2010). Furthermore, almost all (99 percent) of the female employees in the WIC program initiated breastfeeding and 68.6 percent of these employees continued to breastfeed their infants up to one year after delivery (Whaley et al., 2002).

Evidence showed that breastfeeding initiation also affected breastfeeding duration. According to Clemens et al. (1999), early breastfeeding initiation increased EBF duration in Egypt. Mothers who initiated breastfeeding during the first few days of postpartum were more likely to perform EBF longer than mothers who did not initiate breastfeeding at the same time. Mothers who initiated breastfeeding earlier were breastfeeding for a longer duration of 8.05 times at two and up to four weeks postpartum compared to mothers who initiated breastfeeding later ($\chi^2 = 8.05$, $p < .01$) (DiFrisco et al., 2011). There was a significant association between breastfeeding initiation and breastfeeding duration among Japanese mothers. Mothers who initiated breastfeeding within the first 120 minutes after delivery tended to have longer breastfeeding durations compared to mothers who initiated breastfeeding after 120 minutes after delivery (*OR* = 2.50, 95%*CI* = 1.21 - 4.95) (Nakao, Moji, Honda, & Oishi, 2008). Breastfeeding initiation also affected EBF duration in Indonesia (Sumini, 2011). This study included mothers who had infants aged 7 – 12 months in Central Java Province, Indonesia. Breastfeeding initiation and breastfeeding duration data were collected using questionnaires that were developed by the researcher. The researcher did not mention the development of the research questionnaires and there was no information regarding validity and reliability tests of the questionnaires. This study found that there was a positive and significant relationship between

breastfeeding initiation within one hour after delivery and exclusive breastfeeding duration among Indonesian mothers (r = .72, p < .01) (Sumini, 2011).

Intention to breastfeeding. Intention is the central factor of an individual's behavior (Ajzen, 1991). A number of studies supported the effect of intention to actual behavior. A higher intention of the mother to perform breastfeeding resulted in earlier breastfeeding initiation (Donath & Amir, 2003) and a longer duration of breastfeeding practice (Ratananugool, 2001; J. A. Scott, Landers, Hughes, & Binns, 2001; J.A. Scott et al., 1999). According to Donath and Amir (2003) Intention to exclusive breastfeeding was a strong predictor of breastfeeding initiation and duration (OR = 0.91; OR = 0.72, p < 0.05, respectively) in the United Kingdom. A study among Hong Kong mothers found a significant positive correlation between intention to exclusive breastfeeding and actual duration of EBF (r = .67, p < .01) (Dodgson et al., 2004). A longitudinal study among adolescent Thai mothers (Ratananugool, 2001) evaluated the intention to breastfeeding and the breastfeeding practice at four weeks. The study results showed that the best breastfeeding predictor among adolescent mothers was intention to breastfeeding (β = .74, p < .01). In addition, a study (Whaley et al., 2002) examined the predictors of breastfeeding duration. This study revealed that intention to exclusive breastfeeding was a significant predictor of breastfeeding duration (p < .001) (Whaley et al., 2002).

In summary, the literature review showed that several factors were associated with breastfeeding duration and exclusive breastfeeding duration. The relationships among variables on breastfeeding duration are presented in Figure 2. The relationships among variables on exclusive breastfeeding duration are presented in Figure 3.

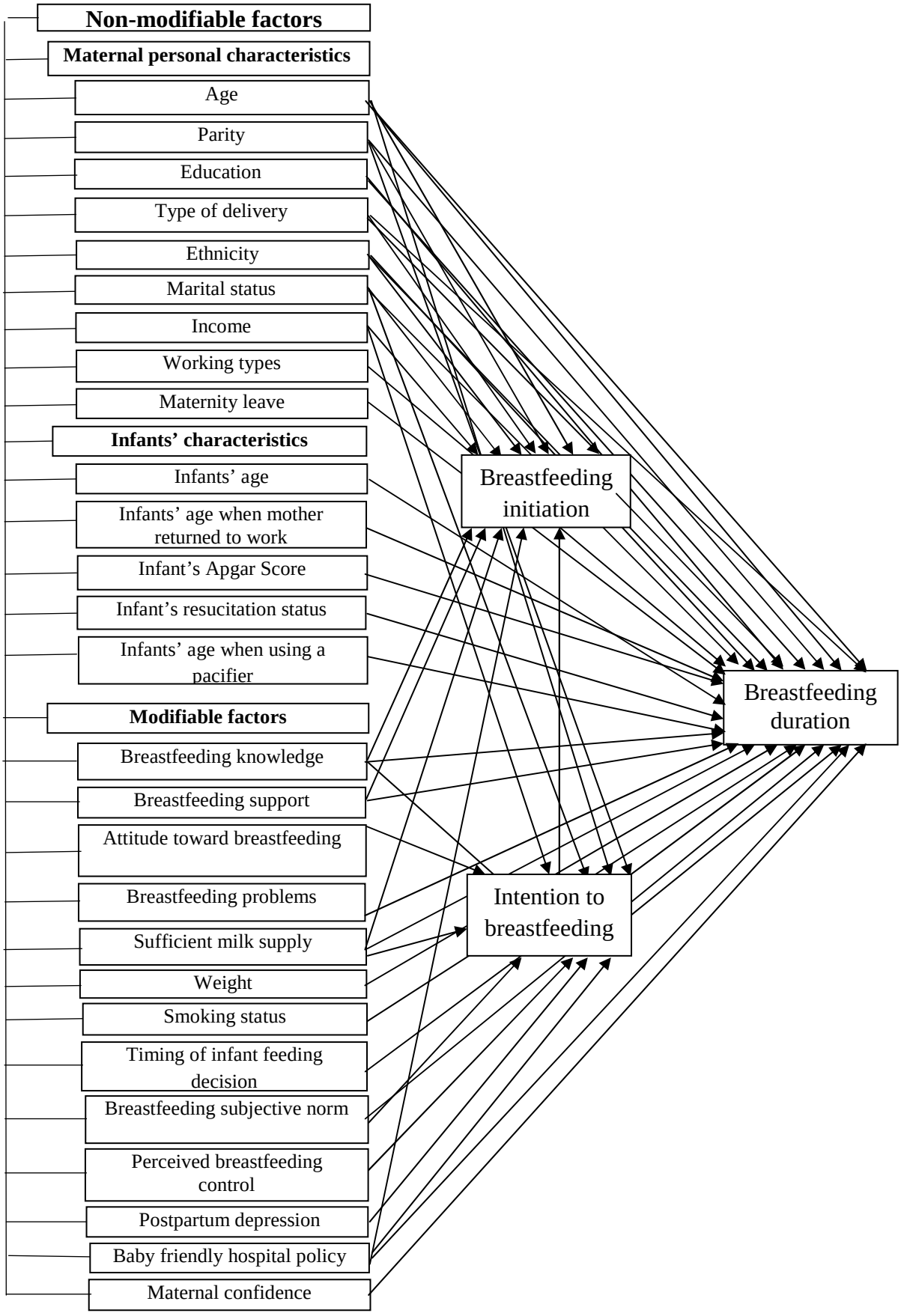

Figure 2. The relationships among predictive variables on breastfeeding duration

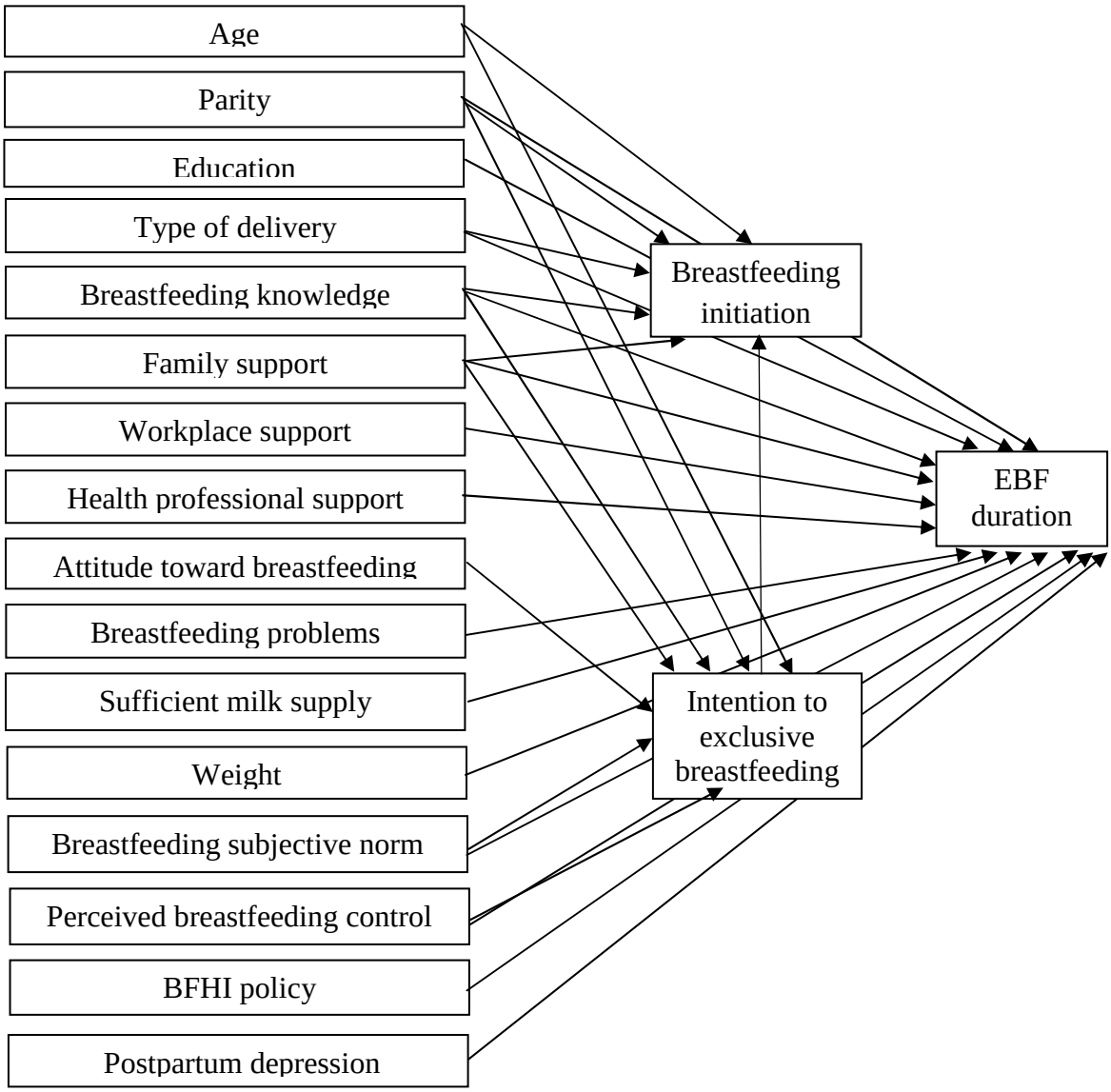

Figure 3. The relationships among predictive variables on exclusive breastfeeding duration

Instruments Related to Study Variables

The literature review found that several instruments used by previous studies to measure the variables influenced exclusive breastfeeding duration. The research instruments used to measure the variables in this study are presented as follows.

Measurement of Breastfeeding Knowledge

1. The Malay-version of Breastfeeding Knowledge Questionnaire (Ismail & Sulaiman, 2010). There were 10 dimensions and 47 items of breastfeeding knowledge: advantages to baby (6 items), advantages to mother (6 items), colostrum (4 items), effective feeding (3 items), breast milk expression (8 items), duration of feeding (4 items), complementary feeding (2 items), problems with breastfeeding (5 items), breast engorgement (2 items), and practical aspect of breastfeeding (7 items). Each item had categorical responses of true and false. A correct response scored as 1, whereas a wrong response scored as 0. The possible range was 0 to 47 with higher scores indicating more knowledge. Content validity was conducted and this process recruited a panel of experts: a breastfeeding consultant, a family health specialist, a nutritionist, and three nurses. To construct validity, an exploratory factor analysis using principal components and a Varimax rotation method were carried out. Factor analysis developed 10 domains of breastfeeding knowledge that resulted in 47 items in the final questionnaire.

Internal consistency reliability was tested using Cronbach's alpha statistic. The Cronbach's alpha value of the final questionnaire was .77. This questionnaire was developed in Malaysia and was appropriate for Indonesia since the majority of Malaysians are Muslim. Furthermore, this questionnaire was tested among working

mothers. However, the reliability test in this study was not appropriate. This questionnaire should have used the Kuder-Richardson 20 (KR-20) to test the reliability because the answer of this questionnaire was dichotomous (Tabachnick & Fidell, 2007).

2. The Breast-Feeding Knowledge Scale (BKS) (Ratananugool, 2001).

Breastfeeding knowledge was measured with a 15-item Breastfeeding Knowledge Scale (BKS). This instrument was developed based on a literature review (Grossman et al., 1990; Gulick, 1982; Susin et al., 1999) and the investigator's clinical experience. This instrument was developed by the investigator to reflect the knowledge of breastfeeding possessed by the mother. A two-point scale, disagree (0) and agree (1), was used for all items. The scores ranged from 0 to 15. Higher scores of this questionnaire indicated higher breastfeeding knowledge of the adolescent mothers.

The content validity of this scale was evaluated by six experts including a pediatrician, an obstetrician, and four registered nurses working in the breastfeeding area. The Content Validity Index (CVI) of this instrument was .87. The pilot study of this scale found that the 15-item BKS had low internal consistency (Cronbach's alpha = .08). There were seven items with negative correlation and when these seven scales were deleted the coefficient alpha increased to .55. However, the researcher decided to use the 15-item BKS in this study although it had a low internal consistency in the pilot study. The researcher mentioned that the internal consistency might be up because the major study included a lot of respondents. This questionnaire was developed in Thailand and tested among adolescent mothers. The reliability test in this study was not suitable. The reliability should have been examined using the

Kuder-Richardson 20 (K-R 20), since the answers of this questionnaire were dichotomous (Tabachnick & Fidell, 2007).

3. The Minnesota Infant Feeding Scale developed by Duckett et al. (1998).

This questionnaire consisted of 14 items of a Breastfeeding Knowledge Test. This questionnaire measured breastfeeding knowledge. The author did not mention the validity and reliability test results of this scale.

4. The Breastfeeding Questionnaire (Gulick, 1982).

This questionnaire was developed to evaluate the maternal breastfeeding knowledge of breastfeeding physiology, breastfeeding benefits, and breastfeeding management. The content validity of this questionnaire was examined by a panel that included four experts in the area of maternity and child health. The questionnaire reliability was evaluated using the Kuder-Richardson 20 (K-R 20) and the reliability test result was .45. In the rest, this questionnaire consisted of 20 items to measure breastfeeding knowledge.

In this study, breastfeeding knowledge was measured using the Modified Malay-version of Breastfeeding Knowledge Questionnaire (Ismail & Sulaiman, 2010). This questionnaire was developed in the South East Asian Muslim countries and the respondents were working mothers. This questionnaire was the most appropriate in the Indonesian context. However, the researcher examined the reliability test of this questionnaire in Indonesia before data collection. To capture the measurement of this concept, the researcher modified and added some items in the original questionnaire. The details of the modification and items added are explained in Chapter 3.

Measurement of Breastfeeding Support

1. The Family Support Questionnaire was developed by Biswas (2010) based on the concept of social support proposed by House (1981). There were 20 items with four dimensions: emotional (5 items), instrumental (5 items), informational (5 items), and appraisal support (5 items). This instrument was a self-reported questionnaire. Responses ranged from 1 (never) to 5 (always). The content validity test included four experts: one pediatrician, one nurse educator from the Department Obstetric-Gynecologic and Midwifery, one nurse educator whose expertise was on the scale development, and one pediatrician in Bangladesh. The questionnaire was tested among Bangladeshi mothers. The alpha coefficient of this questionnaire was .97.

2. The Hughes Breastfeeding Support Scale was developed by Hughes (1984). It was an instrument to measure the perception of support of breast-feeding mothers. Based on the theoretical definitions of social support described by House (1981) and Cobb (1979), three aspects of social support called emotional, instrumental, and informational support were included. This instrument was a self-reported questionnaire that included 30 items with a 4-point Likert scale. Responses ranged from 1 (none at all) to 4 (as much as I wanted). Of the 30 items, 10 were included in emotional support, 10 in instrumental support, and 10 in informational support. The total score was obtained by summing the score from each subscale. The items were obtained through focus group discussions that involved nurses and lactating mothers (Hughes, 1984).

The instrument's developer conducted face validity test that included six experts: a pediatrician, a pediatric resident, one pediatric nurse practitioner/clinical specialist, and three registered nurses working with breastfeeding mothers in clinical

settings. The instrument's developer also did a reliability test using split half correlation: the Spearman-Brown prophecy formula and Cronbach's alpha. The values of the reliability test using split half correlation in emotional subscale, informational subscale, and instrumental subscale were .75, .80, and .74, respectively. The values of the reliability test using the Spearman-Brown prophecy formula in emotional subscale, informational subscale, and instrumental subscale were .85, .89, .85, respectively. The values of the reliability test using Chronbach's alpha in emotional subscale, informational subscale, and instrumental subscale were .85, .88, .83, respectively (Hughes, 1984).

In this study, family support was measured using the Modified Family Support Questionnaire by Biswas (2010). This questionnaire was developed in a country where the majority of the population is Muslim. This questionnaire was the best fit in the Indonesia context and had satisfactory validity and reliability test results. The researcher added two items in this questionnaire based on the literature review regarding family support to working mothers. The details of these two added items are explained in Chapter 3.

Measurement of Breastfeeding Support in the Workplace

The Workplace Breastfeeding Support Scale was developed by Bai, Peng, and Fly (2008) in the United States. The purpose of this scale development was to measure the working mother's perception towards breastfeeding support in the workplace. The scale was developed based on a literature review. There were 12 items and four dimensions: technical (3 items), environmental (3 items), facility (3 items), and peer support (3 items). A panel of experts including a nutritionist, a

lactation consultant, a scale development expert, and a survey scale development expert assessed the content validity. The reliability was tested using Cronbachs' alpha and split half reliability tests and the results of the reliability test for Cronbachs' alpha and split half were .77 and .86, respectively. Sixty-six working mothers were included to test this scale with these inclusion criteria: primiparous, 6 to 12 months postpartum, working outside the home, and had initiated breastfeeding. All items in this questionnaire used a 7-point Likert scale. A higher score indicated a greater perception of workplace breastfeeding support.

In this study, breastfeeding workplace support was measured using the Modified Workplace Breastfeeding Support Scale (Bai, et al., 2008). This questionnaire had satisfactory validity and reliability test results. The researcher modified two items in this questionnaire based on the Indonesian context. The details of these modified items are explained in Chapter 3.

Measurement of Attitude toward Breastfeeding

1. The Breastfeeding Attitude Questionnaire (S. Khatun, 2010) was developed based on the Theory of Reasoned Action (Ajzen, 1988) and a literature review. It consisted of two subscales: breastfeeding beliefs (23 items) and outcome evaluation of breastfeeding beliefs (23 items). A 5-point Likert scale was used for all items ranging from 5 = strongly agree to 1 = strongly disagree. To obtain the attitude toward breastfeeding score, firstly, negative scores needed to be reversed before calculating the total and mean score. Secondly, the total score of breastfeeding beliefs (b_1) was multiplied by the total score of outcome evaluation of breastfeeding beliefs (e_1). Lastly, the results of these multiplications were summed. The formula of the

breastfeeding attitude score was $\sum_{n}(b_i e_1)$. The n was the number of breastfeeding beliefs. The breastfeeding attitude total scores ranged from 529 to 13,225. The mean of the total scores of breastfeeding attitude was 6,877.

Three experts examined the content validity of the Breastfeeding Attitude Questionnaire; two were pediatric nurses in Thailand and another was a pediatrician in Bangladesh. The internal consistency of the Breastfeeding Attitude Questionnaire was examined using Cronbach's Alpha. The value of Cronbach's Alpha on the Breastfeeding Attitude Questionnaire was .94.

2. The Breast-Feeding Attrition Prediction Tool (BAPT) was developed by Janke (1994) based on the Theory of Planned Behavior. The BAPT included 58 attitudinal items. The attitude scale in BAPT consisted of two parts. The first part included 29 items that measured the mothers' beliefs on the outcomes of breastfeeding and bottle feeding. In the first part, there were two sub-scales: negative Breastfeeding Sentiment (NBS) and Positive Breastfeeding Sentiment (PBS). The NBS attitudinal scale consisted of 15 items while the PBS attitudinal scale included 14 items. The second part included 29 structured items related to the items in the first part. A higher score of each sub-scale showed either a greater negative breastfeeding sentiment or a greater positive breast-feeding sentiment. Content validity was examined by 10 nurses in lactation clinics. The principal component procedure with Varimax rotation was done to evaluate the construct validity. Reliabilities (Cronbach's alpha coefficient) were .80 for the overall instrument and .79 – .83 for attitude (Janke, 1994). All items in this questionnaire used a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree) and 1 (not important to me) to 6 (important to me).

3. The Minnesota Infant Feeding Scale was developed by Duckett et al. (1998). The Minnesota Infant Feeding Questionnaire included 25 questions to measure the attitude toward breastfeeding. All of items in this questionnaire used a 7-point Likert scale ranging from -3 to +3. Then, the score was summed. The internal consistency of attitude toward breastfeeding subscale was .90. Beliefs about outcome of breastfeeding and bottle feeding were measured by 19 items with anchor ranging from -3 (unlikely) to +3 (likely). The scores were summed. A higher score indicated greater beliefs. The internal consistencies were .85 and .86 for beliefs in breastfeeding and bottle feeding, respectively.

4. Attitude on Breastfeeding Scale (Wambach, 1997) was used to measure the prenatal attitude of adolescent mothers during the last six weeks of pregnancy. This questionnaire included 17 items and used a 5-point Likert scale. The mean score in this scale was determined by summing and dividing the number of items. The higher score indicated a positive attitude toward breastfeeding. The instrument developer did not mention a validity test. The internal consistency was .80 and the test-retest result at two weeks was .90.

5. The Breastfeeding Attitude Questionnaire was developed by Hill et al. (2008) based on TPB (Ajzen, 1991) and the Expanded Rational Expectations Intentions Model (EREIM) (Sapp, 1991). This instrument measured the attitude toward breastfeeding of low-income late pregnant mothers and lactating mothers in the United States. There were three items to measure the mothers' attitudes toward breastfeeding. These included bad/good, foolish/wise, and harmful/beneficial. Mothers answered the statements using bipolar adjective pairs. Mothers showed either agreement or disagreement to the statements (G. J. Hill et al., 2008).

6. The Attitude to Behavior Questionnaire was developed by Manstead, Proffitt, and Smart (1983) based on the TRA (1975). This questionnaire measured the mothers' attitudes toward breastfeeding and bottle feeding using 12 items which included six items that measured beliefs toward infant feeding methods and the rest measured evaluation of each feeding beliefs statement. All of the items in this questionnaire used a 6-point Likert scale ranging from 1 (very likely) to 6 (very unlikely) for infant feeding beliefs and 1 (very important to me) to 6 (completely unimportant to me) for outcome evaluation. The questionnaire developer did not address the validity and reliability tests (Manstead, Proffitt, & Smart, 1983).

In this study, attitude toward breastfeeding was measured using the Modified Breastfeeding Attitude Questionnaire (S. Khatun, 2010). This questionnaire was developed in a country in which the majority of the population is Muslim. This questionnaire also had good validity and reliability test results. The researcher modified some items in this questionnaire to make it the best fit in the Indonesian context. The researcher also added some items based on the literature review regarding Muslim beliefs related to breastfeeding. The details of modified and added items are explained in Chapter 3.

Measurement of Breastfeeding Problems

The Breast-Feeding Experience Scale (BES) was developed by Wambach (1997) to measure perceived breastfeeding problems. This tool has two parts. The first part of the BES consisted of 17 multiple-choice items and the second part was one open-end item. It was used to measure the degree to which the events were perceived as problems, such as sore nipples, breast engorgement, leaking breasts, sucking

difficulty, infant fussiness, insufficient milk concerns, and feelings of embarrassment. A 5-point rating scale for each item ranged from 1 not at all to 5 unbearable. Total scores were obtained by summing all responses. A higher score indicated greater perceived severity of breastfeeding problems. The content validity was examined by four experts: two lactation consultants and two maternal-newborn clinical nurse specialists. The reliability was tested using the Cronbach's alpha and test-retest. The Cronbach's alpha coefficient was .76 and the test-retest was .70 (Wambach, 1997).

In this study, breastfeeding problems were measured using The Breast-Feeding Experience Scale (Wambach, 1997). This scale had sufficient validity and reliability test results.

Measurement of Sufficient Milk Supply

1. The nine-item H & H Lactation Scale was modified from the H & H Lactation Scale (P.D. Hill and Humenick, 1996) by Punthmatharith and Singh (2005). The original scale was constructed based on an Insufficient Milk Supply (IMS) conceptual framework proposed by Hill and Humenick (1989). Punthmatharith and Singh (2005) performed the psychometric test with Thai mothers. The nine-item H & H Lactation Scale consisted of three dimensions: maternal confident/commitment breastfeeding (3 items), perceived infant breastfeeding satiety (3 items), and maternal-infant breastfeeding satisfaction (3 items). It was a self-report questionnaire and written in both the Thai and English languages. All items were anchored with a 7-point Likert scale from 1 strongly disagree to 7 strongly agree. The score calculation was started from reversing the negative scored items, then the ratings of all of the items were entered and the last counting the average mean of individual item scores

and average mean of each subscale (composite scores). Higher scores reflected greater levels of a mother's confidence/commitment, perceived mother-infant breastfeeding satiety, and perceived infant satiety.

The construct validity of the 9-item H&H lactation scale was examined using convergent validity and discriminant validity. This scale had a significant convergent validity and significant discriminant validity. The nomological validity was examined and the result showed a satisfactory nomological validity.

The reliability of the original H & H Scale was re-examined using an interjudge reliability, inter-rater reliability, and average intensity. The reliability test found that overall the five items had a high level of agreement (items 3, 5, 6, 12, and 13), nine items had a moderate level of agreement (items 2, 8, 9, 11, 15, 16, 17, 18, and 19) and one item had a low level of agreement (item 7). The average of intensity rating of these items ranged from 2.25 to 3.50. Then, the researcher selected the 14 items of the original H & H scale that had moderate and high level of agreement to engage for further analysis (Puthmatharith & Singh, 2005).

The exploratory factor analysis found that only nine items met the dominant loading (>.30) and cross-loading spread (>.20) criteria. The confirmatory factor analysis revealed that the chi-square goodness-of-fit statistic was nonsignificant (χ^2= 32.2, *df* = 24, p = .12), which meant that there was no significant differences between the model and the data. Cross-validation using Lagrange Multiplier Test and structural equation modeling showed identical parameters and covariance matrices for a 9-item scale (Puthmatharith & Singh, 2005).

2. The H & H Lactation Scale (P. D. Hill & Humenick, 1996) was developed based on an Insufficient Milk Supply (IMS) conceptual framework proposed by Hill

and Humenick (1989). The H & H Lactation Scale consisted of a 20-item self-report instrument where all items were anchored with a 7-point Likert scale from 1 strongly disagree to 7 strongly agree. To calculate the score, after reversing the negative scored items, the ratings for all items were summed. The scores ranged from 20 to 140. The higher scores reflected greater levels of a mother's commitment and perceived infant satiety. All subscales showed moderate to high internal consistency (α = .75 to .98).

In this study, the 9-item H & H Lactation Scale (Punthmatharith & Singh, 2005) measured sufficient milk supply. This scale was psychometrically tested among Thai mothers. This scale was the best fit in the Indonesia's context. Furthermore, this scale had satisfactory validity and reliability.

Measurement of Intention to Exclusive Breastfeeding

1. The Intention to Exclusive Breastfeeding Scale (S. Khatun, 2010) was developed based on the TRA (Ajzen, 1988) and a literature review. There was a 0 to 10 point numeric rating scale that had endpoints of 0 = "I should not exclusively breastfeed my baby for at least six months postpartum" and 10 = "I should exclusively breastfeed my baby for at least six months postpartum". The midpoint of 5 on the scale represented unsureness of EBF. A higher score represented a stronger intention to exclusive breastfeeding.

Three experts examined the content validity of the Breastfeeding Attitude Questionnaire; two were pediatrics nurses in Thailand and another was a pediatrician in Bangladesh. The test-retest technique was performed to examine the stability of the research instrument over time. At 24 hours after the first intention to exclusive

breastfeeding data collection, the test-retest technique was done. The correlation coefficient reliability of the Intention to Exclusive Breastfeeding Scale was .85.

2. Intention to breastfeed Exclusively (Bai, et al., 2011) measured two items on a 7-point scale according to the following: “My exclusive breastfeeding for six months was” and “I will do exclusive breastfeeding for six months”. Intention to exclusive breastfeeding was assessed by averaging the participant’s responses to the two items. Each score ranged from 1 to 7 (1 = extremely unlikely, 2 = unlikely, 3 = slightly unlikely 4 = neither, 5 = slightly likely, 6 = likely, and 7 = extremely likely). There was no information on the validity and reliability tests for this instrument.

In this study, the Intention to Exclusive Breastfeeding Scale (S. Khatun, 2010) measured the intention to exclusive breastfeeding. This scale was developed in Bangladesh in which the majority of the population is Muslim. This scale was appropriate in the Indonesian context.

The Proposed Causal Model of Breastfeeding Duration Among Working Muslim mothers

Three previous studies regarding causal models of breastfeeding duration were performed among postpartum mothers in the United States and Hong Kong. Ducket et al. (1998) developed and tested the causal model of breastfeeding duration among the American mothers. The researchers divided the subjects into three groups: homemaker mothers, part-time working mothers, and full-time working mothers. This study used the TPB, empirical evidence, preliminary analysis to the data set, and practical consideration to guide the researchers to select the study variables. The

predictive variables in this study were intention to breastfeeding, attitude toward breastfeeding, attitude toward bottle feeding, beliefs about outcomes of breastfeeding, beliefs about outcomes of bottle feeding, subjective norm, referent beliefs, control beliefs, perceived control, perceived insufficient milk supply, level of education, and breastfeeding knowledge. The dependent variable was breastfeeding duration.

The results revealed that three models had a satisfactory statistical test result. The homemaker group (*GFI* = .95), the employed part-time group (*GFI* = .94), and the employed full-time group (*GFI* = .97) had a high goodness-of-fit index. It means the models had a close fit in the three groups. In the homemaker group, insufficient milk supply (β = -.31, p < .05) and intention to breastfeeding (β = .43, p < .05) significantly predicted breastfeeding duration directly. Attitude toward bottle feeding (β = -.27, p < .05), attitude toward breastfeeding (β = .33, p < .05), and perceived control (β = .28, p < .05) had indirect effects on breastfeeding duration via intention to breastfeeding. The attitude toward breastfeeding (β = .31, p < .05), referent beliefs (β = .15, p < .05), and control beliefs (β = .34, p < .05) predicted perceived control. Beliefs about outcomes of bottle feeding (β = .42, p < .05) and referent beliefs (β = -.15, p < .05) predicted attitude toward bottle feeding. Maternal education (β = .10, p < .05), beliefs about outcomes of breastfeeding (β = .28, p < .05), subjective norm (β = .27, p < .05), and referent beliefs (β = .25, p < .05) predicted attitude toward breastfeeding (Ducket et al., 1998).

In the worked part-time group of mothers, breastfeeding knowledge (β = .13, p < .05), maternal education (β = .13, p < .05), attitude toward bottle feeding (β = -.13 p < .05), attitude toward breastfeeding (β = .11, p < .05), intention to breastfeeding

(β = .29, p < .05), and insufficient milk supply (β = -.12, p < .05) had direct effects on breastfeeding duration. Attitude toward breastfeeding (β = .33, p < .05), attitude toward bottle feeding (β = -.27, p < .05), and perceived breastfeeding control (β = .28, p < .05) had indirect effects on breastfeeding duration via intention to breastfeeding. Maternal education (β = -.22, p < .05), beliefs about outcomes of formula (β = .30, p < .05), beliefs about the outcomes of breastfeeding (β = -.39, p < .05), and referent beliefs (β = -.15, p < .05) predicted attitude toward bottle feeding. Maternal education (β = .10, p < .05), beliefs about the outcomes of breastfeeding (β = .28, p < .05), and referent beliefs (β = .49, p < .05) predicted attitude toward breastfeeding. Attitude toward breastfeeding (β = .17, p < .05), subjective norm (β = .15, p < .05), referent beliefs (β = .15, p < .05), and control beliefs (β = .44, p < .05) predicted perceived control (Ducket et al., 1998).

In the worked full-time group, breastfeeding knowledge (β = .13, p < .05), maternal education (β = .13, p < .05), attitude toward bottle feeding (β = -.13, p < .05), attitude toward breastfeeding (β = .11, p < .05), intention to breastfeeding (β = .33, p < .05), and insufficient milk supply (β = -.12, p < .05) had direct effects on breastfeeding duration. Attitude toward bottle feeding (β = -.16, p < .05), attitude toward breastfeeding (β = .20, p < .05), and perceived control (β = .28, p < .05) had indirect effects on breastfeeding duration via intention to breastfeeding. Maternal education (β = .14, p < .05), beliefs about outcomes of formula (β = .30, p < .05), beliefs about outcomes of breastfeeding (β = -.20, p < .05), and referent beliefs (β = -.15, p < .05) predicted attitude toward bottle feeding. Maternal education (β = .10, p < .05), beliefs about outcomes of breastfeeding (β = .28, p < .05), subjective norm (β = .37, p < .05), and referent beliefs (β = .12, p < .05) predicted

attitude toward breastfeeding. Attitude toward bottle feeding (β = -.20, p < .05), attitude toward breastfeeding (β = .19, p < .05), referent beliefs (β = .26, p < .05), and control beliefs (β = .44, p < .05) predicted perceived control.

The second causal model study aimed to evaluate the predictors of intention to breastfeeding and breastfeeding outcome among Kansas mothers. This study was conducted by Wambach (1998). The study examined a causal model based on the TPB in terms of selecting the predictors of intention to breastfeeding and breastfeeding outcome. This study included 274 pregnant mothers at the third trimester of pregnancy. Attitude toward breastfeeding, subjective norm, perceived behavior control, and intention to breastfeeding were measured at the third trimester of pregnancy. Breastfeeding duration was measured by questionnaires sent via mail at four weeks postpartum. This study found that breastfeeding attitude (β = .30, p < .05) and perceived breastfeeding control (β = .27, p < .01) significantly predicted the intention to breastfeeding (Wambach, 1998). In this study, subjective norm could not predict intention to breastfeeding (Wambach, 1998). Intention to breastfeeding (β = .22, p < .01) predicted breastfeeding duration (Wambach, 1998).

The third causal model of breastfeeding duration study was conducted by Dodgson et al. (2003) in Hong Kong. This study depicted the model of breastfeeding duration based on a theoretical framework, empirical evidence, clinical insights, and the data patterns. TPB was selected as the theoretical framework in this study. The predictive variables in this study were beliefs about outcomes of formula, beliefs about outcomes of breastfeeding, referent beliefs, control beliefs, the attitude toward formula feeding, the attitude toward breastfeeding, subjective norm, a perceived control, intention, an antecedent index (e.g., attendance at childbirth class(es),

attendance at breastfeeding class(es), the maternal education, NSVD, the rooming-in, a plan to exclusively breastfeed), the breastfeeding difficulty index, and the proximity index (e.g., sore nipples, breast infection, baby's illness, fatigue). The dependent variable was breastfeeding duration. This study examined three models: The strict Theory of Planned Behavior model, The Modified Minnesota Theory of Planned Behavior-breastfeeding for employed women model, and The Theory of Planned Behavior Perceived Control Mediated Model.

Among those three models, The Modified Minnesota Theory of Planned Behavior-breastfeeding for Employed Women Model and The Theory of Planned Behavior Perceived Control Mediated Model had adequate fit test results compared to that of The Strict Theory of Planned Behavior Model (Dodgson et al., 2003). The Modified Minnesota Theory of Planned Behavior-breastfeeding for Employed Women Model had a satisfactory chi-square test result (χ^2 = 84.71), fit index (*GFI* = .94), and low residual (*SRMR* = .07). The Theory of Planned Behavior Perceived Control Mediated Model had a satisfactory Chi-square test result (χ^2 = 73.54), fit index (*GFI* = .95), and residual (*SRMR* = .07). In contrast, the strict Theory of Planned Behavior model had an unsatisfactory chi-square test result (χ^2 = 261.68), fit index (*GFI* = .85), and residual (*SRMR* = .16).

The Modified Minnesota Theory of Planned Behavior for employed women model test results showed that antecedents (β = .12, p < .05), intention to breastfeeding (β = .42, p <.05), difficulties (β = -.26, p < .05), and proximity index (β = .11, p < .05) had direct effects on breastfeeding duration. Perceived control

(β = .37, p < .05) had an indirect effect on breastfeeding duration via intention to breastfeeding. Perceived control (β = .12, p < .05) also had an indirect effect on breastfeeding duration via the proximity index. The attitude toward breastfeeding (β = .33, p < .05), the referent beliefs (β = .10, p < .05), and the control beliefs (β = .39, p < .05) predicted perceived control. The antecedents (β = .12, p < .05) and beliefs about outcomes of formula feeding (β = .14, p < .05) predicted attitude toward formula feeding. The antecedents (β = .26, p < .05) and beliefs about outcomes of breastfeeding (β = .28, p < .05) predicted attitude toward breastfeeding (Dodgson et al., 2003).

The Theory of Planned Behavior Perceived Control Mediated Model test results showed that the antecedents (β = .13, p < .05), perceived control (β = .17, p < .05), intention to breastfeeding (β = .36, p < .05), difficulties (β = -.24, p < .05), and proximity index (β = .10, p < .05) had direct effects on the breastfeeding duration. The perceived control (β = .42, p < .05) had an indirect effect on breastfeeding duration via intention to breastfeeding. The attitude toward breastfeeding (β = .12, p < .05), control beliefs (β = .37, p < .05), and the subjective norm (β = .17, p < .05) predicted perceived control. The beliefs about outcomes of formula feeding (β = .16, p < .05) predicted attitude toward formula feeding. The antecedents (β = .26, p < .05), beliefs about outcomes of breastfeeding (β = .25, p < .05), and control beliefs (β = .30, p < .05) predicted attitude toward breastfeeding. The referent beliefs score (β = .55, p < .05) predicted subjective norm significantly (Dodgson et al., 2003).

The strict Theory of Planned Behavior model test results showed that intention to breastfeeding (β = .37, p < .05), perceived control (β = .18, p < .05), difficulties

(β = -.25, p < .05), and proximity index (β = .12, p < .05) had direct effects on breastfeeding duration. The perceived control (β = .38, p < .05) had an indirect effect on breastfeeding duration via intention to breastfeeding. The beliefs about outcomes of formula feeding (β = .16, p < .05) predicted attitude toward formula feeding. The beliefs about outcomes of breastfeeding (β = .39, p < .05) predicted attitude toward breastfeeding. The referent beliefs (β = .55, p < .05) influenced subjective norm. The control beliefs (β = .54, p < .05) predicted perceived control. The antecedents (β = .12, p < .05) predicted beliefs about outcomes of formula feeding (Dodgson et al., 2003).

The Theory of Planned Behavior and evidence from previous studies suggest that several factors contributed to breastfeeding duration among working mothers and Muslim mothers. The literature review found that the factors influencing breastfeeding duration among Muslim mothers were the knowledge about breastfeeding, family support, workplace support, attitude toward breastfeeding, breastfeeding problems, and insufficient milk supply. These factors were mediated by breastfeeding initiation and intention to exclusive breastfeeding. The rationales of variable selection in the study are presented as follows.

Breastfeeding knowledge is well known as a breastfeeding predictive factor. Much empirical evidence showed that a low level of breastfeeding knowledge influenced the intention to exclusive breastfeeding and duration among mothers in developing countries (Chezem et al., 2006;Mitra et al., 2004; Ratananugool, 2001). A low level of breastfeeding knowledge significantly correlated with short EBF duration in Indonesia (Rahayuningsih, 2005), low intention to breastfeeding in Bangladesh (Thomas, 2011), and low breastfeeding initiation in Indonesia (Hidayat & Dewantiningrum, 2012).

Previous study results revealed that working mothers reported higher breastfeeding initiation, greater intention to exclusive breastfeeding and longer EBF duration while receiving support from family members (Clifford & McIntyre, 2008; Johnston & Esposito, 2007), coworkers (Johnston & Esposito, 2007), and the employers (Brown et al., 2001; Clifford & McIntyre, 2008; Johnston & Esposito, 2007; Kosmala-Anderson & Wallace, 2006). Moreover, the newest Indonesian health policies related to EBF (Indonesian Ministry of Health, 2012) suggested all workplaces to support lactating working mothers to enhance the EBF duration.

The TPB was widely used to evaluate the predictors of human behavior. Two empirical studies found that attitude toward breastfeeding was the predictor of intention to exclusive breastfeeding among mothers in Bangladesh (Khatun et al., 2010) and in Indonesia (Manurung, 2012). This study included religiosity as an attitude variable because religiosity affected an individual's perception of a specific behavior, particularly in the Muslim population. The majority of Javanese mothers are Muslim. The faith and the adherence to Islam's beliefs significantly affected health status in Indonesia (Rahmah, 2007) and breastfeeding duration among Muslim mothers in Israel (Azaiza & Palyi, 2007). It assumes that the strong beliefs toward infant feeding will guide a mother's behavior related to breastfeeding duration in Indonesia. This study also included cultural beliefs, since cultural beliefs strongly influenced the exclusive breastfeeding duration among Indonesian mothers, particularly on Java Island (Josefa & Margawati, 2011; Manurung, 2010). The measurement of Indonesian mothers' cultural beliefs and religiosity related to breastfeeding was included in the attitude toward breastfeeding measurement.

Breastfeeding problems may occur during the breastfeeding period. Evidence indicated that breastfeeding problems significantly affected exclusive breastfeeding duration among working mothers in Indonesia. It was reported that breastfeeding problems caused short breastfeeding duration (Rejeki, 2008). Furthermore, a perception of insufficient breast milk supply was the most common reason of a short duration of exclusive breastfeeding among Indonesian mothers (Afiyanti & Juliastuti, 2012). The breastfeeding problems and sufficient milk supply was included as the study's variable.

This study controlled other influencing factors on breastfeeding duration that were not included as predictors of breastfeeding duration. The researcher included other predictive factors in the inclusion and exclusion criteria, such as the marital status, infant's characteristics, maternal age, type of delivery, working types, drug abuse, current maternal disease, maternal health history, breast anomaly, and current maternal medication status.

The literature review showed that several factors influenced breastfeeding duration. The predictive factors were breastfeeding knowledge, family support, workplace support, attitude toward breastfeeding, breastfeeding problems, and sufficient milk supply. The mediating factors were breastfeeding initiation and the intention to exclusive breastfeeding. The proposed model in this study was presented in Figure 4.

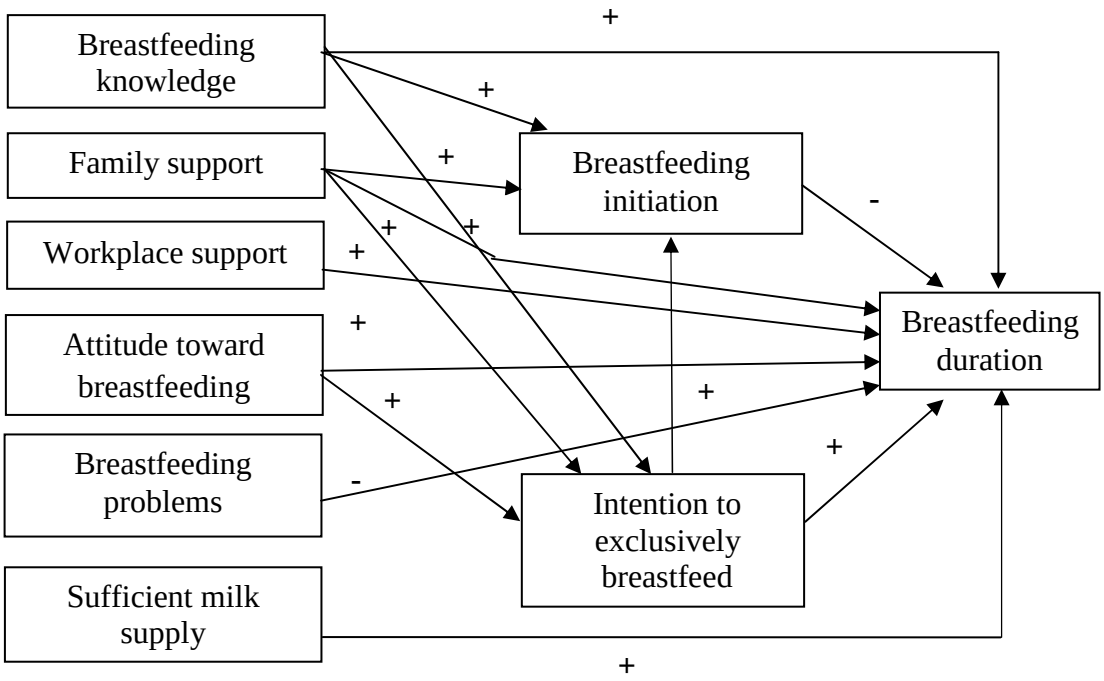

Figure 4. The proposed causal model of breastfeeding duration among working Muslim mothers

Conclusion

Breastfeeding is well known as the best infant feeding source. Generally, every mother produces breast milk after delivery. Breastfeeding provides several benefits for both the mothers and infants. WHO recommends exclusive breastfeeding up to six months of an infant's age based on a systematic review. Although the Indonesian government issued several health policies regarding breastfeeding and EBF, in fact, the EBF duration in Indonesia was still very low. The majority of Indonesians are Muslim and they were more likely to breastfeed their infant due to their adherence to their religious beliefs. However, working Muslim mothers struggle to keep in balance between their job duties and the breastfeeding process, especially during the first six months after delivery to give EBF for their infants. Previous studies showed the contribution of several factors on breastfeeding duration and EBF duration.

Some factors had positive effects on breastfeeding duration and EBF duration; however, some factors had negative effects on breastfeeding duration and EBF duration. The literature review showed that the influencing factors of breastfeeding duration and EBF duration could be divided into non-modifiable factors and modifiable factors; however, the study findings were inconsistent and different across ethnicities. This study selected modifiable variables only which could be improved, changed, and revised by mothers and nurses. In addition, the researcher selected study variables which were appropriate in the Indonesian context and the relationships between the variables were empirically tested as in the previous studies.

The Theory of Planned Behavior and the literature review guided the researcher to select variables which fit in the Indonesian context and depicted relationships between the selected variables which fit in the Indonesian context. The correlations among breastfeeding knowledge, breastfeeding support from family and workplace, attitude toward breastfeeding, breastfeeding problems, sufficient milk supply, breastfeeding initiation, intention to exclusive breastfeeding, and breastfeeding duration among Muslim and working mothers were opened to be questioned. There was much evidence of increased breastfeeding duration by enhancing intention to exclusive breastfeeding, breastfeeding initiation, and managing the contributing factors.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter provides information about research design, setting, population and sample, research instruments, translation of research instruments, validity and reliability of research instruments, data collection, ethical considerations, and data analysis.

Research Design

This is a descriptive cross-sectional study. This study examined the correlations among breastfeeding knowledge, family support, workplace support, attitude toward breastfeeding, sufficient milk supply, breastfeeding problems, intention to exclusive breastfeeding, breastfeeding initiation, and breastfeeding duration. A set of questionnaires was used to investigate the causal model of breastfeeding duration among working Muslim mothers.

Setting

The study was conducted in Semarang city, Central Java Province, Indonesia where majority of the population in Central Java Province was Muslim (97 percent) (Central Java Province Statistic, 2012). In Central Java Province, there is no explicit population based information about the number of working mothers who perform EBF. The number of working mothers was 58.8 percent (Central Java Province Statistics, 2010) and 25.6 percent of mothers perform EBF (Central Java Ministry of Health, 2013).

Data was collected at the Primary Health Centre (PHC) in Semarang city, Central Java Province. This is the capital city of the Central Java Province, Indonesia and the education, economic, production, and trading center. It represents postpartum working mothers because most of the mothers in this city are goverment employees, private employees, factory employees, teachers, health care providers, etc. It consists of 28 PHCs. Approximately 13,274 mothers who had infants aged less than 1 year old had came to visit the PHC for the infant's immunization (Central Java Province Ministry of Health, 2011).

Population and Sample

The population in this study was working Muslim mothers with infants' aged from six - twelve months old who lived in Semarang, Central Java Province, Indonesia. The sample in this study were those mothers who met the following inclusion criteria: 1) being married, 2) aged more than 18 years, 3) no history of complications after delivery (e.g. postpartum hemorrhage or convulsion), and 4) working outside home at least 8 hours per day. The inclusion criteria of infants consisted of 1) being healthy, 2) full-term, 3) singleton, and 4) weighing more than 2,500 grams.

The exclusion criteria of mothers consisted of 1) drug abuse, 2) suffering diseases that may interfere with breastfeeding (e.g. HIV/AIDS, herpes simplex with lesion on breast, untreated active tuberculosis, maternal syphilis, diabetes), 3) on-going treatment (e.g. Radioactive therapy, chemotherapy, psychoses therapy, anti-convulsion therapy), and 4) history of inverted nipples, hypoplastic breast, breast surgery, that may interfere with breastfeeding. The exclusion criteria of infants consisted of serious illness or complications that may interfere with latch on and breastfeeding process (e.g. cleft lip, cleft palate, esophageal atresia).

Sample size. According to Nunnally and Bernstein (as cited in Munro, 2001), a causal model study needs 30 subjects for each independent variable. The study had 8 independent variables; therefore, the sample size in this study was 240 mothers.

Sampling. To be representatives of post partum working Muslim mothers in Semarang city, Central Java Province, multisite random sampling was used to select the sample. There are 16 Districts in Semarang city, the multisite random sampling started by selecting 4 Districts using simple random sampling. The selected Districts were Ngaliyan, Mijen, Banyumanik, and Semarang Barat. Then, the researcher randomly selected one or two PHCs in each District based on the number of PHCs in each district. The selected PHCs were Ngaliyan, Mijen, Srondol, Ngesrep, Manyaran, Ngemplak, and Kagok. Kagok PHC was used to test the research instrument's reliability and the other six PHCs were used to collect the research data. The researcher or research assistant (RA) came to the selected settings and recruited eligible mothers.

Instrumentations

This study used a set of questionnaires to measure the variables which were presented in Table 1. Data was collected using a self-report structured questionnaire that consisted of ten parts: 1) The Personal Characteristics Questionnaire, 2) The Modified Malay-version of Breastfeeding Knowledge Questionnaire, 3) The Modified Family Support Questionnaire, 4) The Modified Workplace Breastfeeding Support Scale, 5) The Modified Breastfeeding Attitude Questionnaire, 6) The Breastfeeding Experience Scale, 7) The nine-item H & H Lactation Scale, 8) The Intention to Exclusive Breastfeeding Scale, 9) The Breastfeeding Initiation Scale, and 10) The Breastfeeding Duration Scale (Appendix A). Asking permission of using all research instruments were performed (Appendix B).

1. The Personal Characteristics Questionnaire

This questionnaire was developed by the researcher based on related literature regarding personal characteristics that influenced EBF duration. This questionnaire consisted of 14 items related to personal demographics of the mother, husband, and infant. The mother's data included age, parity, marital status, education level, occupation, family income, family pattern, and breastfeeding information sources. The husband's data included education level and occupation. The infant's data included age, gender, type of delivery, and place of delivery.

2. The Modified Malay-version of Breastfeeding Knowledge Questionnaire

The questionnaire was developed by Ismail and Sulaiman (2010). There were 47 items and ten dimensions of breastfeeding knowledge: Advantages to baby (6 items), advantages to mother (6 items), colostrum (4 items), effective feeding (3 items), breast milk expression (8 items), duration of feeding (4 items), complementary feeding (2 items), problems with breastfeeding (5 items), breast engorgement (2 items), and practical aspect of breastfeeding (7 items). Content validity was conducted by a panel of experts; a breastfeeding consultant, a family health specialist, a nutritionist, and three nurses. Internal consistency of the Malay-version of Breastfeeding Knowledge Questionnaire was examined using Cronbach's alpha statistic. The Cronbach's alpha value of this questionnaire was .77. Since the reliability test of the original version of the Malay-version of Breastfeeding Knowledge Questionnaire was inappropriate; thus, before collecting the data, the researcher tested the internal consistency of this questionnaire using Kuder-Richardson 20.

The Modified Malay-version of Breastfeeding Knowledge Questionnaire was used to measure breastfeeding knowledge. The original Malay-version of Breastfeeding Knowledge Questionnaire consists of 47 items. In this study, the researcher modified the questionnaire based on experts' suggestions and with permission from Ismail and Sulaiman. The researcher modified items number 40 based on the current evidence (Breast engorgement may reduce using cold packs) and number 41 (The use of cabbage leaf may help to reduce breast engorgement). The researcher discarded items number 43 (Giving water is encouraged after every breastfeeding), 44 (Belching after feeding shows that the baby is full), and 45 (Babies who get enough feeding will pass urine more frequently) because there was no evidence regarding the statements. In addition, the researcher added items number 44, 47, 48, and 49 based on literature review in order to further represent the concept of breastfeeding knowledge among working mothers and Javanese culture (Appendix A).

The total number of items of the Modified Malay-version of Breastfeeding Knowledge Questionnaire was 49. Correct answers were 29 items whereas wrong answers were 20 items. Each item had categorical responses of correct and incorrect. A correct response was scored as 1, whereas a wrong response was scored as 0. The possible score of the Modified Malay-version of Breastfeeding Knowledge Questionnaire in this study ranged from 0 to 49. A higher score indicated more knowledge. The using and modification of this questionnaire in this study was permitted by Dr. Tengku Alina Tengku Ismail and Dr. Zaharah Sulaiman on October 17, 2013.

The internal consistency of the Modified Malay-version of Breastfeeding Knowledge Questionnaire was examined using the Kuder-Richardson 20 (KR-20) statistic. The result of the Kuder-Richardson 20 test revealed that the internal consistency of The Modified Malay-version of Breastfeeding Knowledge Questionnaire was .82 (Table 1). According to Polit and Back (2007), the value of KR-20 at least .70 is reliable meaning that the internal consistency of the Modified Malay-version of Breastfeeding Knowledge Questionnaire was reliable.

3. The Modified Family Support Questionnaire

This questionnaire was developed by Biswas (2010) based on House (1981)'s social support proposed to measure family support of breastfeeding mothers. There were 20 items with four dimensions: emotional (5 items), instrumental (5 items), informational (5 items), and appraisal support (5 items). This instrument was a self-report questionnaire with a 5-item Likert scale. Responses ranged from 1 (never) to 5 (always). The content validity test of the original Family Support Questionnaire was performed by four experts including a pediatrician, a nurse educator from the Department of Obstetric-Gynecologic and Midwifery, a nurse educator who was an expert on scale development, and a pediatrician in Bangladesh. The original Family Support Questionnaire was tested among Bangladeshi mothers. Cronbach's alpha coefficient of the original Family Support Questionnaire was .97.

The researcher added one item in dimension 1 (emotional support) and another item in dimension 2 (instrumental support) (Appendix A) based on the literature review regarding family support to lactating working mothers. The Modified Family Support Questionnaire had 22 items of positive statements. The total score and each dimension of the Modified Family Support Questionnaire can be obtained by

summing the total score of all items or each dimension and divided by the number of the total items or total of each dimensions items. The mean score ranged from 1 – 5. The use and modification of this questionnaire in this study was permitted by Lipika Rani Biswas on November 15, 2013. The researcher also obtained permission from the Graduate School, Prince of Songkla University.

The reliability of The Modified-Family Support Questionnaire was examined using Cronbach's alpha statistic. The test result showed that the Cronbach's alpha coefficient of The Modified-Family Support Questionnaire was .94 (Table 1). According to Polit and Beck (2007), a research instrument examined using Cronbach's alpha statistic is reliable if the internal consistency is .80 for the existing instrument.

4. The Modified Workplace Breastfeeding Support Scale

The scale was developed by Bai, Peng, and Fly (2008) in the United States. The purpose of this scale development was to measure the working mothers' perception towards breastfeeding support in the workplace. The scale was developed based on literature review. There were 12 items and four dimensions: Technical (3 items), environmental (3 items), facility (3 items), and peer support (3 items). The content validity of the original Workplace Breastfeeding Support Scale was assessed by a panel of experts including a nutritionist, a lactation consultant, a scale development expert, and a survey scale development expert. The reliability of the original Workplace Breastfeeding Support Scale was tested using Cronbach's alpha and split half reliability test and the results of reliability test for Cronbach's alpha and split half were .77 and .86, respectively. Sixty six working mothers were included to test this scale with inclusion criteria including primiparous, 6 to 12 months postpartum, working outside home, and have initiated breastfeeding.

The researcher modified two items (e.g. items 7 and 9) (My workplace has an on-site daycare and my workplace has a breast pump for nursing mothers to use, respectively) (Appendix A) to make it the best fit with Indonesia context. In Indonesia, on-site daycare is not usualu and mothers provide a breast pump themselves. All items in the Modified Workplace Support Questionnaire were positive statements that were measured using a 7-point Likert scale. A higher score indicated greater perception of workplace breastfeeding support. Each dimension's score on the Modified Workplace Support Scale could be obtained by summing the total score of each dimension and dividing it by the number of the total of each dimension's items. The mean score ranged from 1 - 7. Its use and modification was permitted by Assoc. Prof. Dr. Yeon Bai (Personal communication, October 17, 2013).

The internal consistency of The Modified Workplace Breastfeeding Support Scale was examined using the Cronbach's alpha statistic. The test result showed that the Cronbach's alpha coefficient of The Modified Workplace Support Questionnaire was .87 (Table 1). According to Polit and Beck (2007), an existing research instrument which is examined using Cronbach's alpha statistic is considered reliable if the internal consistency is .80. In conclusion, The Modified Workplace Breastfeeding Support Scale was reliable.

5. The Modified Breastfeeding Attitude Questionnaire

The original Breastfeeding Attitude Questionnaire was developed by Khatun, Puthmatharith, and Orapiriyakul (2010) to measure the breastfeeding attitude of breastfeeding mothers. This questionnaire was developed based on the Theory of Reasoned Action (Ajzen, 1988) and literature review. It consisted of two subscales: Breastfeeding beliefs (23 items) and the outcome evaluation of breastfeeding beliefs

(23 items). This questionnaire used a 5-point Likert scale for all items ranging from 5 (strongly agree) to 1 (strongly disagree). The content validity of the original Breastfeeding Attitude Questionnaire was examined by three experts, two were pediatric nurses in Thailand and one was a pediatrician in Bangladesh. The reliability of the original Breastfeeding Attitude Questionnaire was examined using Cronbach's Alpha. The value of Cronbach's Alpha on the original Breastfeeding Attitude Questionnaire was .94 (S. Khatun, 2010).

The researcher made a minor modification of 12 items (e.g., items 4, 11, 17, 18, 20, 23, 29, 36, 42, 43, 45, and 48, Appendix A).The researcher modified the original version of the Breastfeeding Attitude Questionnaire based on the specific cultural beliefs of Javanese, Indonesian mothers, such as change the word misripani/honey to banana (item 4), mustrad oil to honey (item 11), Evil air (Alga batash) to go out side home before 35 days after delivery (item 17), Evil eye (Najar laga) to going to the funeral (item 18), after working in the sun to having a long trip (item 20), honey to banana (item 23), misripani/honey to banana (item 29), mustrad oil to honey (item 36), Evil air (Alga batash) to go out side home before 35 days after delivery (item 42), Evil eye (Najar laga) to going to the funeral (item 43), after working in the sun to having a long trip (item 45), and honey to banana (item 48).

In this study, the researcher added 2 items in the breastfeeding beliefs subscale (e.g., items 24 and 25) and 2 items in the outcome evaluation subscale (e.g., items 49 and 50) (Appendix A) based on religious beliefs of Muslim mothers. Thus, the Modified Breastfeeding Attitude Questionnaire consisted of 50 items and two subscales: Breastfeeding beliefs (25 items) and the outcome evaluation of breastfeeding

beliefs (25 items). Nine items were positive statements and 16 items were negative statements. Negative scores were reversed before calculating the total and mean score.

The breastfeeding attitude score was obtained by multiplying the total score of breastfeeding beliefs (b_1) and the total score of outcome evaluation of breastfeeding beliefs (e_1), then, summing the result. The formula to calculate the breastfeeding attitude score was $\sum_{n}(b_i e_1)$. The n was the number of breastfeeding beliefs. The total breastfeeding attitude scores ranged from 625 to 15,625. The mean of breastfeeding attitude score is obtained by dividing the total score to number of items (J. Khatun, 2010). In this study the mean of breastfeeding attitude scores ranged from 12.5 to 312.5. The use and modification of this questionnaire in this study was permitted by Shanzida Khatun on October 9, 2013 and the researcher also recieved permission from the Graduate School, Prince of Songkla University.

The internal consistency of The Modified Breastfeeding Attitude Questionnaire was examined using Cronbach's alpha statistic. The test result showed that Cronbach's alpha coefficient of The Modified Breastfeeding Attitude Questionnaire was .95 (Table 1). According to Polit and Beck (2007), an existing research instrument which is examined using Cronbach's alpha statistic is considered reliable if the internal consistency is .80.

6. The Breastfeeding Experience Scale

The scale was developed by Wambach (1997) to measure perceived breast-feeding problems. This tool had two parts. The first part of the Breastfeeding Experience Scale consisted of 17 multiple-choice items and the second part was one open-ended item. It measured the degree of which the events were perceived as problems, such as sore nipples, engorgement, leaking breasts, sucking difficulty, infant

fussiness, insufficient milk concerns, and feelings of embarrassment. A 5-point rating scale for each item ranged from 1 (not at all) to 5 (unbearable). The total scores could be obtained by summing all of the responses. Mean scores were calculated by dividing the total scores with the total breastfeeding problems. The researcher presented the range, mean, or median score of the BES scale in the research report (K. Wambach, personal communication, October 16, 2013). A higher score indicated greater perception of breast-feeding problems. Content validity was examined by four experts: two lactation consultants and two maternal- newborn clinical nurse specialists. The reliability was tested using Cronbach's alpha and test-retest. Cronbach's alpha coefficient was .76 and test-retest was .70 (Wambach, 1997). The use of this questionnaire in this study was permitted by Assoc. Prof. Dr. Karen Wambach on October 3, 2013.

The internal consistency of The Breastfeeding Experience Scale was examined using the Cronbach's alpha statistic. The test result showed that the Cronbach's alpha coefficient of The Breastfeeding Experience Scale was .89 (Table 1). According to Polit and Beck (2007), an existing research instrument which is examined using Cronbach's alpha statistic is considered reliable if the internal consistency is .80.

7. The nine-item H & H Lactation Scale

The nine-item H & H Lactation Scale was modified from the original H & H Lactation Scale (Hill & Humenick, 1996) and tested for psychometric properties by Punthmatharith and Singh (2005) in Thailand with the permission of Hill and Humenick. The original H & H Lactation Scale was developed by Hill and Humenick (1996) based on the Insufficient Milk Supply (IMS) conceptual framework proposed by Hill and Humenick (1989). The nine-item H & H Lactation Scale

consisted of three dimensions: Maternal confident/commitment breastfeeding (3 items), perceived infant breastfeeding satiety (3 items), and maternal-infant breastfeeding satisfaction (3 items). It was a self-report instrument written in both Thai and English language where all items were scored on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). Six items were positive statements and 3 items were negative statements. To calculate the score, the negative score items were reversed, the ratings for all items were entered, then the average mean of individual item scores and average mean of each subscale (combination scores) were claculated. Higher scores reflected the greater levels of mothers' confidence/commitment to breastfeeding, perceived infant satiety, and mothers-infant breastfeeding satisfaction.

The construct validity of the nine-item H & H Lactation Scale was tested using a convergent validity and discriminant validity. The scale had a significant convergent validity and significant discriminant validity. The nomological validity was examined and the result was satisfactory. The reliability of the original H & H Scale was tested using interjudge reliability, inter-rater reliability, and average intensity. The result showed that 14 items of the original H & H scale had moderate or high level. These 14 items were engaged in the further psychometric property analysis (Puthmatharith & Singh, 2005). The exploratory factor analysis found that only nine items met the criteria. Confirmatory factor analysis revealed that the model fitted the data. The Lagrange Multiplier Test and structural equation modeling were used for cross-validation. These tests also found that the nine-item H & H Lactation Scale had identical parameters and covariance matrices (Puthmatharith & Singh, 2005). The use of this questionnaire in this study was permitted by Assoc. Prof. Dr. Busakorn Punthmatharith on November 24, 2013.

The internal consistency of the nine-item H & H Scale was examined using the Cronbach's alpha statistic. The test result showed that the Cronbach's alpha coefficient of the nine-item H & H Scale was .85 (Table 1). According to Polit and Beck (2007), an existing research instrument which is examined using Cronbach's alpha statistic is considered reliable if the internal consistency is .80.

8. The Intention to Exclusive Breastfeeding Scale

The scale was developed by Khatun, Punthmatharith, and Orapiriyakul (2010) based on the TRA (Ajzen, 1988) and literature review. It has a 0 to 10 point numeric rating scale containing an endpoint of "I should not exclusively breastfeed my baby for at least six months postpartum" (0) and "I should exclusively breastfeed my baby for at least six months postpartum" (10). The midpoint (5) of the scale represents unsure of EBF. A higher score represented a stronger intention to perform EBF in the third trimester of pregnancy. The content validity of The Intention to Exclusive Breastfeeding Scale was examined by three experts, two were pediatric nurses in Thailand and one was a pediatrician in Bangladesh. The test-retest technique was performed to examine the stability of the research instrument over time. The test-retest technique was performed 24 hours after the first intention data was collected. The correlation coefficient reliability of the Intention to Exclusively Breastfeed Scale was .85 (S. Khatun, 2010). The use of this questionnaire in this study was permitted by Sanzida Khatun on October 9, 2013. The researcher also obtained permission from the Graduate School, Prince of Songkla University.

The internal consistency of The Intention to Exclusive Breastfeeding Scale was examined using test-retest. The test-retest technique was performed 24 hours after the first intention data was collected. Pearson Corelation and intraclass correlation were

used to test the reliability of this instrument. The test results of Pearson Correlation and Intraclass Correlation provided similar results. The reliability of the intention to exclusive breastfeeding Scale was .99 (Table 1). According to Polit and Beck (2007), the test-retest reliability ranges from 0 to 1, where at least .75 is considered excellent reliability.

9. Breastfeeding Initiation Scale

The Breastfeeding Initiation Scale was developed by the researcher based on literature review. As recommended by WHO (2006), breastfeeding initiation should be carried out within the first hour after delivery. Breastfeeding initiation information was obtained using one question “How many minutes/hours after delivery did you start breastfeeding the infant for the first time?”

The internal consistency of The Breastfeeding Initiation Scale was examined using test-retest. The test-retest technique was performed 24 hours after the first breastfeeding initiation data was collected. Pearson Corrrelation and Intraclass Correlation were used to test the reliability of The Breastfeeding Initiation Scale. The results of Pearson Corrrelation and Intraclass Correlation revealed that the reliability of The Breastfeeding Initiation Scale was perfect. The correlation between time 1 and time 2 of The Breastfeeding Initiation Scale equaled 1 (Table 1). According to Polit and Beck (2007), one is the perfect test-retest reliability.

10. Breastfeeding Duration Scale

The Exclusive Breastfeeding Duration Scale was developed by the researcher based on literature review. As suggested by WHO (2012), the exclusive breastfeeding duration was six months. During this time, the infant receives only breast milk as the infant feeding source. The exclusive breastfeeding duration data was

collected using one question “How many days/months did you provide only breast milk as the infants’ feeding source?” The answer was presented in a range from birth up to six months.

The internal consistency of The Breastfeeding Duration Scale was examined using test-retest. The test-retest technique was performed 24 hours after the first breastfeeding duration data was collected. Pearson Correlation and Intraclass Correlation were used to test the reliabitily of The Breastfeeding Duration Scale. Pearson Correlation and Intraclass Correlation test provided similar results. The correlation between time 1 and time 2 of The Breastfeeding Duration Scale was .99 (Table 1). According to Polit and Beck (2007), test-retest reliability ranges from 0 to 1, where at least .75 is considered excellent reliability.

Validity of the instruments

The instruments were evaluated for validity. Before performing a back translation, the new or modified questionnaires (e.g. The Modified Malay-version of Breastfeeding Knowledge Questionnaire, The Modified Family Support Questionnaire, The Modified Workplace Breastfeeding Support Scale, The Modified Breastfeeding Attitude Questionnaire, The Breastfeeding Initiation Scale, and The Breastfeeding Duration Scale) were examined for content validity, language, and cultural suitability. The content validity was examined by the panel of experts. They were two faculty members in Obstetric and Gynaecological Department, Faculty of Nursing, Prince of Songkla University and one pediatrician in Faculty of Medicine, Prince of Songkla University who were experts in breastfeeding area in Thailand and two faculty members in Maternity Nursing Department, Faculty of Nursing, University of Indonesia who had expertise in breastfeeding in Indonesia.

This panel of experts evaluated the questionnaires suitability to the related construct, the clinical and cultural appropriateness, and language relevance with the Indonesian context. For content validity index (CVI), the experts were asked to rate each item on a 4-point scale with 1 indicating not relevant and 4 indicating very relevant. Then the researcher calculated the proportion of rate 3 and 4 of the research instruments. The proportion of rate 3 and 4 of The Modified Malay-version of Breastfeeding Knowledge Questionnaire, The Modified Family Support Questionnaire, The Modified Workplace Breastfeeding Support Scale, The Modified Breastfeeding Attitude Questionnaire, The Breastfeeding Initiation Scale, and The Breastfeeding Duration Scale were .96, .95, .85, .95, 1, and 1 (Table 1). In conclusion, all of the research questionnaires in this study had an adequate content validity because all of them had the proportion of rate 3 and 4 more than .80. According to Waltz, Stricklands, and Lens (2005), adequate content validity is shown by the proportion of rate 3 and 4 more than .80.

Back translation of the research instruments

All of questionnaires in this study were developed in English language. To ensure the equality between the original version questionnaire and the Indonesian language version, the researcher performed a back translation technique. The process of back translation was performed based on Hilton and Skrutkowski guidance (Hilton & Skrutkowski, 2002). The translation process in this study consisted of three steps as follows.

1. Translate the original version into another language (Hilton & Skrutkowski, 2002). The research instrument translation process in this study was started by translating the English language version questionnaire into an Indonesian language

version questionnaire. This process was carried out by the three bilingual nurses who had graduated from a master degree in a country with English as the main language. After the translation, the researcher collected all of the translated questionnaires from the three translators. Thereafter, the researcher compared and reviewed the three questionnaries for discrepancies. Afterward, the researcher summarized and discussed them with the advisor. This step resulted in one Indonesian questionnaire.

2. The second process of back translation was to translate the other language version questionnaire back into the original version questionnaire (Hilton & Skrutkowski, 2002). The translation of Indonesian language version questionnaire to English version was performed by two bilingual Indonesian nurses who had graduated from a master degree and one bilingual Indonesian nurse who was studying for doctoral degree in a country with English as the main language without seeing the original questionnaire. After the translation, the researcher collected all of the translated questionnaires from the three translators. Thereafter, the researcher compared and reviewed them for discrepancies. Afterward, the researcher summarized and discussed the questionnaires with the advisor. This step resulted in the one English questionnaire.

3. The third step of the back translation process was to compare and examine any distinction on meanings, resemblance of interpretation and comparability of language between the original and back translation version questionnaire (Hilton & Skrutkowski, 2002). The original and back translated version of the questionnaires were compared and examined by one American editor. The researcher asked for help from an English native speaker to carry out this process. The expected result of this process was to gain the equivalence. The results of this process were some recommendations to change some words in the back translation version questionnaire to ensure a similar

meaning with the original version questionnaire. The editor suggested adding “may happen” or “can happen” in number 46 of the back translation version of the Modified Malay-Breastfeeding Knowledge Questionnaire. In number 11 of the back translation version of the Modified Workplace Support Questionnaire, the editor suggested changing the word “a fun” to “fun”. In addition, the editor suggested changing the question in the back translation version of the Breastfeeding Initiation Scale from “How long after delivery did you start breastfeeding for the first time?” to “When did you start breastfeeding your baby for the first time after delivery?”

4. The researcher discussed the editors’ suggestions with the advisor. Afterward, the researcher changed the words in the back translation version questionnares based on the editors’ suggestions. The researcher discussed the editors’ suggestions to be applied in the Indonesian language questionnaires with three bilingual Indonesian nurses. After discussion, the researcher and the three bilingual Indonesian nurses reached an agreement and approved the editors’ suggestions to be applied in the Indonesian version questionnaires.

After translating all of the original questionnaires from English to Indonesian, the researcher conducted a reliability test of the research instruments. The researcher recruited 30 subjects who met the inclusion criteria of the study to conduct the reliability test of the research instruments. The researcher tested the normality of the data before examining the reliability of the research instruments. All instruments were normally distributed. The reliability results mentioned previously in each instruments topic and are shown in Table 1.

The summary of the instruments used in this study is shown in Table 1.

Table 1

Instruments of the Study

Concepts	Variables	Instruments	Level of Measurement	Validity (CVI)	Reliability
Personal characteristics	Mother				
	Age	PCQ	Number of years-ratio	-	-
	Parity	PCQ	Number of children-ordinal	-	-
	Marital status	PCQ	Current relationship status with a partner-nominal	-	-
	Education level	PCQ	Number of years go to school-ordinal	-	-
	Occupation	PCQ	Activity to get salary-nominal	-	-
	Income	PCQ	Household income monthly in Rupiah-interval	-	-
	Family pattern	PCQ	Type of current family at home-nominal	-	-
	Residence area	PCQ	The categorization of live place-nominal	-	-
	Breastfeeding information sources	PCQ	People who advice/give information regarding breastfeeding-nominal	-	-
	Husband				
	Education level	PCQ	Number of years go to school-ordinal	-	-
	Occupation	PCQ	Activity to get salary-nominal	-	-
	Infant				
	Age	PCQ	Number of months-ratio	-	-
	Gender	PCQ	Type of infant sex-nominal	-	-

Table 1 (Continue)

Concepts	Variables	Instruments	Level of Measurement	Validity (CVI)	Reliability
	Type of delivery	PCQ	Method of the current infant birth-nominal	-	-
	Place of birth	PCQ	Place of current infant birth-nominal	-	-
Breastfeeding knowledge	Breastfeeding knowledge	MM-BKQ	Total scores on MM-BKQ-ratio	.96	KR-20 = .82
Breastfeeding support	Family support	MFSQ	Mean scores on MFSQ-interval	.95	Cronbach's Alpha = .94
Workplace Support	Workplace support	MWBSQ	Mean scores on MWBSS-interval	.85	Cronbach's Alpha = .87
Attitude toward breastfeeding	Attitude toward breastfeeding	MABQ	Mean scores on ABQ-interval	.95	Cronbach's Alpha = .95
Breastfeeding Problems	Breastfeeding problems	BES	Mean scores on BES-interval	-	-
Sufficient milk supply	Sufficient milk supply	Nine-item H & H	Mean scores on Nine-item H &H-interval	-	-
Intention to EBF	Intention to EBF	IEBS	Mean scores on IEBFS-interval	-	Pearson Correlation = .99 ICC = .99
Breastfeeding initiation	Breastfeeding initiation	BIS	Mean score on BIS-ratio	1	Pearson Correlation = 1 ICC = 1
Breastfeeding duration	Breastfeeding duration	BDS	Mean score on BDS-ratio	1	Pearson Correlation = .99 ICC = .99

Note. PCQ = The Personal Characteristics Questionnaire, MM-BKQ = The Modified Malay-version of Breastfeeding Knowledge Questionnaire, MFSQ = The Modified Family Support Questionnaire, MWBSS = The Modified Workplace Breastfeeding Support Scale, MABQ = The Modified Attitude toward Breastfeeding Questionnaire, Nine-item H & H = The Nine-item H & H Lactation Scale, IEBS = The Intention to Exclusive Breastfeeding Scale, BIS = The Breastfeeding Initiation Scale, and BDS = The Breastfeeding Duration Scale

Data Collection

The data collection process in this study was divided into two phases. The first phase was preparation and the second phase was data collection, as follows:

Preparation phase. In the preparation phase, the researcher prepared everything that was needed for data collection.

1. After the research proposal was approved by the Institutional Review Board of Faculty of Nursing, Prince of Songkla University on February 25, 2014, the researchers received an approval letter from the ethics committee of Faculty of Nursing, Prince of Songkla University and received a permission letter from the Dean of Faculty of Nursing, Prince of Songkla University.

2. The researcher asked for permission letters from the Indonesian Ministry of Health, Central Java Province Ministry of Health. The researcher received a permission letter to conduct a reliability test at Kagok PHC and to collect the research data at Ngaliyan, Mijen, Srondol, Ngesrep, Manyaran, and Ngemplak PHCs.

3. The researcher sent the permission letter from the Indonesian Ministry of Health, Central Java Province Ministry of Health to the Head of Kagok, Ngaliyan, Mijen, Srondol, Ngesrep, Manyaran, and Ngemplak PHCs.

4. The researcher recruited four research's assistants (RAs) to help the researcher collect data. The RAs were nurse who had received a bachelor degree in nursing science. The researcher provided training to the RAs by giving information about the research objectives, the inclusion and exclusion criteria, recruiting potential mothers, data collection procedure, the research ethics, and the research instruments. The researcher reviewed all items in the research instruments with the RAs and discussed the research instruments clearly. The researcher also explained the responsibility as a researcher and the importance of trustworthiness. During the data

collection period, the researcher always communicated with the RAs. The researcher monitored the data collection progress weekly. Every problem was discussed and solved by the researcher and the RAs.

Data collection phase. The researcher started data collection after the preparation phase was completed. The steps of data collection were as follows.

1. The potential mothers were approached by the researcher or RAs to ask for their willingness to join the study.

2. The researcher or RAs introduced and explained to the mothers about the objectives of the study, the study procedures, the risks and benefits for subjects, the rights and responsibilities of subjects, and the confidentiality principle. The researcher or RAs asked the mothers regarding the explanation clarity.

3. After mothers understood the study, the researcher or RAs asked for mothers' willingness to participate in this study. When the eligible mothers agreed to participate in this study, they were asked to sign the informed consent form (Appendix C).

4. The researcher or RAs explained about the questionnaires, how to fill in the questionnaires, and provided the opportunity for the mother to ask if there was a confusing question.

5. The researcher or RAs collected the data based on the mother's availability.

6. The researcher or RAs asked the mothers to fill in all questionnaires completely and stayed with mothers until they answered all the questions and returned the questionnaires to the researcher or RAs directly. If while completing the questionnaires, mothers need to either breastfeed their infant or for any other reasons, data collection was stopped and waited for the participating mother's readiness and willingness to continue completing the questionnaires.

7. The researcher or RAs assessed the completeness and correctness of the questionnaires while staying with the mothers. Whenever there were some incomplete answers in the questionnaire, the researcher or RAs asked the mothers to rectify their answers or to complete all the questionnaire's questions. The time required to complete the questionnaires was 120 - 180 minutes.

Ethical consideration

To ensure the human's rights, the researcher asked for approval from the Ethics Committee of Faculty of Nursing, Prince of Songkla University, Thailand. After approval was obtained, the researcher asked for permission to access the respondents from the Indonesian Ministry of Health, Central Java Province Ministry of Health. To keep the confidentiality, all data from respondents was kept by the researcher and was not shown to other people who had no association with the study. The researcher also explained to the respondents that the researcher used code during data collection, data analysis, result report and publication to protect the origin of personal data and to keep the anonymity of the respondents. Moreover, the researcher gave information that the respondents had a right to withdraw from this study at any time without any negative consequences and that they would continue to receive regular health care as before being recruited to be a respondent in this study. When the respondents agreed to participate in this study, they were asked to sign the informed consent form (Appendix C).

The researcher or RAs managed the potential risks which were experienced by mothers during data collection. First, the researcher offered mothers to go to the toilet, breastfeed the infant, or carry out another activity first before filling out the questionnaires. Then during the data collection, the researcher or RAs considered the

infants, the researcher/RAs took care of the infants while the mothers were completing all of the questionnaires. When the infant cried and could not be managed by the researcher/RAs, the mothers stopped filling out the questionnaire and held the infant, silenced the fussy infant, breastfeed the infant, or gave the infant to another person. When the mothers were too tired to complete the questionnaires at one time or mothers only had a little time, the researcher/RAs asked for permission to go to the mothers' house, visited the mothers at their office, and made an appointment in another place. There were two mothers who withdrew from this study because they were too busy to complete all of the questionnaires.

Data analysis

All data in this study were entered, checked and analyzed using computer software. The data analysis steps in this study were as follows:

1. All data were checked to ensure that there were no missing data before starting data analysis. Missing data was defined as the respondents did not provide some information for the items in the research instruments. According to Tabachnick and Fidel (2007), missing data is a serious problem in the data analysis process, particularly when the amount of missing data is more than five percent. The missing data pattern is more important than the amount of missing data (Schlomer, Baunan, & Card, 2010). Missing data can be managed by mean substitution regression, expectation maximization, and multiple imputations based on the missing data pattern (Schlomer et al., 2010). If the amount of missing data is minimal, the researcher can delete the cases (Tabachnick & Fidel, 2007).

2. All data were checked for univariate and multivariate outliers. Outliers are extreme data which are numerically far from the other sample values (Tabachnick & Fidell, 2007). The causes of outliers may come from typing error in data entry, data collection problems, the respondent not being a part of the research sample, or being a part of research sample but they had an extreme value compared to others sample. Outliers could be identified either through visual inspection of box plot, histograms, or frequency distributions (Tabachnick & Fidel, 2007). In addition, the Mahalanobis Distance was used to assess the multivariate outliers on predictors. The cutoff points of this multivariate outlier indicator was Mahalanobis distance $\geq$ (3p/n) (n-1), where *p* = number of independent variables and *n* = sample size (Kercher as cited in Petpichetchian, 2001; Stevens, 2002). The univariate outliers were evaluated using boxplot and the multivariate outliers were detected using Mahalanobis distance. Based on the box plot inspection, there were no univariate outliers in this study (Appendix D). The multivariate outliers were detected using Mahalanobis distance (Tabachnick & Fidel, 2007). The results of multivariate outliers' evaluation showed that there were no extreme outliers. The cutoff point of multivariate outlier indicator was Mahalanobis distance $\geq$ (3p/n) (n-1), where *p* = number of independent variables and *n* = sample size (Kercher as cited in Petpichetchian, 2001; Stevens, 2002). In this study, there was no measurement of Mahalanobis distance $\geq$ 23.9. Thus, univariate and multivariate assumptions were met.

3. All data were analyzed using descriptive statistics. Continuous data were summarized as mean or median, depending on whether the data were normally distributed or not. Categorical data were presented as frequency and percentage (Table 3 and Table 4).

4. Personal characteristics data were presented as frequency, percentage, mean or median, and standard deviation or quartile deviation (Table 3).

5. The researcher tested the assumptions of path analysis.

Before testing the path analysis assumptions, the researcher had to check the occurence of multivariate outliers. According to Olobatuyi (2006) and Tabachnick and Fidell (2007), the assumptions of path analysis include: level of measurement, normality, linearity, recursiveness, level of measurement error, homoscedasticity, autocorrelation, multicollinearity, specification error, and model identification.

5.1 Level of measurement

The level of measurement of dependent variable is an interval or a ratio and the level of measurement of independent variable can be nominal up to the ratio (Olobatuyi, 2006). The level of measurement of dependent variable in this study was ratio and the levels of measurement of independent variables in this study were interval or ratio. Path analysis statistic requires the independent and dependent variables measured at interval or ratio level (Tabachnick & Fidel, 2007). In this study, all of the study variables were interval level. So, the first assumption of path analysis was met.

5.2 Normality

The distribution of independent variables and dependent variable should be a normal plot (Tabachnick & Fidel, 2007). This study used P-P plot to evaluate the multivariate normality. The result of multivariate normality test showed that the data distributions are plotted around the straight line (Appendix D). Only a few data are plotted above and below the straight line. It means that the data were normally distributed.

5.3 Linearity

In a causal model, the relationship between independent variables and dependent variable should be linear. The linearity assumption can be tested visually using a scatterplot (Tabachnick & Fidel, 2007). In this study, the linearity assumption was examined using scatterplots (Tabachnick & Fidell, 2007). The multivariate linearity was examined using scatter plot of the studentized deleted residual (Y axis) and the standardized predicted value (X axis) (Appendix D). The test result showed that the plots were distributed along the straight line. It can be concluded that the relationships among the DV and IVs were linear.

5.4 Recursiveness

The correlation between independent variables and dependent variable in the model should be a one way flow (Olobatuyi, 2006). The relationship between variables is shown by an arrow, the researcher inspected the arrow between variables to ensure it had one way flow (Olobatuyi, 2006). In this study, all of the arrows had a one way flow arrow.

5.5 Homoscedasticity

The homoscedasticity refers to the condition in which the error terms are equally distributed across the value of independent variables (Olobatuyi, 2006). Munro defined homoscedasticity as distribution of dependent variable scores with equal variability for every value of independent variable scores (Munro, 2001). Homoscedasticity can be evaluated using a multivariate scatterplot (Tabachnick & Fidel, 2007). In this study, homoscedasticity was examined using a scatterplot. This assumption can be checked by visual examination of a plot of the studentized deleted residuals (the errors) by the regression standardized predicted (Tabachnick & Fidel, 2007). This study examined the homoscedasticity using a plot of the studentized

deleted residuals (Y axis) and the standardized predicted value (X axis) (Appendix D). In this study, the distribution of the data showed homogeneity of variance for all values of independent variables. The variance of errors is the same across all levels of the IV.

5.6 Autocorrelation

Autocorrelation is the correlation between the values of the same variables based on the related object. Autocorrelation can be evaluated using a Durbin-Watson test (Tabachnick & Fidell, 2007). If the Durbin-Watson value is close to two means there is no autocorrelation in the study variables (Munro, 2001). The Durbin-Watson value which is close to 0 means there is a strong positive autocorrelation, while the Durbin-Watson value close to four means there is a strong negative autocorrelation (Munro, 2001). The autocorrelation was examined using the value of Durbin Waston. In this study, the Durbin Waston value was 1.987. It means that the Durbin Watson value in this study met the criteria.

5.7 Multicollinearity

Multicollinearity is a situation in which the independent variables have no correlation with any other independent variables or with any linear combination of other linear combinations (Olobatuyi, 2006). Multicollinearity can be detected using the Pearson correlation coefficient, Tolerance, and Variance Inflation Factors. The accepted value of multicollinearity using the Pearson correlation coefficient is < .85, the Tolerance value is close to zero, and VIF > 10 (Munro, 2001). In this study, there were no variables which had multicollinearity. The cutoff points of multicollinearity are tolerance value less than .10 (near to zero), VIF value more than 10, and correlation more than .85 (Munro, 2001). In this study, there was no variable which had a tolerance value near to zero and VIF value more than 10. The lowest Tolerance value was 0.614

and the highest Tolerance value was 0.870. The lowest VIF was 1.150 and the highest VIF was 1.629 (Appendix D). In this study, there was no correlation among dependent variables which had a value more than .85. The lowest correlation value was 0.071 and the highest correlation value was 0.510 (Appendix D).

5.8 Specification error

This assumption refers to being careful in selecting and specifying the research variables. Relevant variables should be included and the irrelevant variables should be omitted. The rationale of this assumption is that the model captures only the reality. This assumption can be detected based on the existing theory or evidence (Olobatuyi, 2006). In this study, the researcher reviewed the theory and literature to select the most appropriate variables to be included in this study. The variables in this study were supported by theoretical considerations and empirical results. The researcher selected published articles which reported studies conducted in the developing countries or a Muslim majority country (suitable for the Indonesia context). The concept of the variables was similar to this study concept. The variables were measurable and observable. The variables had (at least) an existing research instrument. Correlations among variables had logical relationships. The relationship between the studies' variables can be statistically tested using path analysis.

5.9 Model identification

The last assumption was model identification. A model is identified when the number of known (correlations) is the same as the number of unknown (path coefficients) (Olobatuyi, 2006). According to Tabachnick and Fidel (2007), the first step in model identification was to count the number of data points and the number of parameters. "Data points were the amount of unique information in the sample variances and covariances" (Tabachnick & Fidel, 2007, p.695). "Parameters are the

number of regression coefficients, variances, and covariances of independent variables" (Tabachnick & Fidel, 2007, p.695). The next step in model identification was to compare the number of data points and the number of parameters. The overidentified model was defined as the number of data points more than the number of parameters. The identified model was defined as the number of data points similar to the number of parameters. Last, the underidentified model was defined as the numbers of data points less than the number of parameters. In a causal model study, the model should be overidentified (Tabachnick & Fidel, 2007). According to Tabachnick and Fidel (2007), the formula to calculate data point is $\frac{p(p+1)}{2}$. In this formula, p refers to the number of study variables, so this study had $\frac{9(9+1)}{2} = 45$ data points. There were 14 parameters in this study. Then, the number of data points minus the number of parameters. In this study, 45 – 14 = 31, therefore, this study was overidentified.

6. The researcher assessed the goodness-of-fit index of the model. The results of the goodness-of-fit index of the hypothesized model and modified model are presented in Chapter 4. The procedure of assessment of the goodness-of-fit index was performed as follows.

6.1 Chi-Square

The differences between the actual and the predicted correlation or covariance matrices were examined using Chi-square indicator. The expected Chi-square value was closer to zero that indicates a smaller difference between the expected and observed covariance matrices.

6.2 Normed Chi-square

The normed chi-square was also used to examine whether the model fits the data. The normed Chi-square was calculated by dividing chi-square value with the degree of freedom (*df*). The modelfits with the data when the norm Chi-square value is < 3.0 (Munro, 2001) and the model has a perfect fit with the data if the norm Chi-square value is < 1.0. The value of norm Chi-square > 5.0 is unacceptable (Hair et al., 2010).

6.3 Normed Fit Index (NFI)

NFI analyzes the discrepancy between the Chi-square value of the hypothesized model and the Chi-square value of the null model. The NFI is very sensitive to sample size. The acceptable NFI value is ≥ .95 (Hair et al., 2010).

6.4 Non-Normed Fit Index (NNFI)

The NNFI was quite similar to NFI; however, NNFI was better than NFI because NNFI corrects the sample size sensitivity. The acceptable NNFI value is ≥ .90 (Hair et al., 2010).

6.5 Goodness-of-Fit Index (GFI)

The goodness-of-fit index (GFI) was a measure of fit between the hypothesized model and the observed covariance matrix. Hair et al. (2010) mentioned that the minimum acceptable value of the goodness of fit indices (GFI) is ≥ .90. The principal is a higher value of GFI indicates a better fit model.

6.6 Adjusted Goodness-of- Fit Index (AGFI)

The adjusted goodness-of-fit index (AGFI) also measured the fit index between the hypothesized model and the observed covariance matrix; however, AGFI was affected by the number of indicators of each latent variable. The acceptable AGFI value is ≥ .90 (Tabachnick & Fidell, 2007).

6.7 Comparative Fit Indices (CFI)

The comparative fit indices (CFI) assessed the comparison of fitness index between a target model and the initial model (Munro, 2001). The minimum acceptable CFI value is ≥ .95 (Munro, 2001).

6.8 Root Mean Square Error of Approximation (RMSEA)

The RMSEA is an average of residual between the fitted and the original covariance matrix. RMSEA assessed the fit shortage of the final model compared to the perfect models (Tabachnick & Fidell, 2007). An RMSEA score between .06 - .10 is acceptable fit (Hair, Anderson, Babin, & Anderson, 2010) and according to Browne and Cudek (as cited in Munro, 2001), the final model is fit when the RMSEA score is < .10 and the RMSEA score of more than .10 indicated that the model is not fit.

6.9 Standardized Root Mean Square Residual (SRMR)

The SRMR is the square root of the discrepancy between the sample covariance matrix and the model covariance matrix. The SRMR acceptable value is < .08 or < .05 (Hair et al., 2010).

7. The researcher interpreted the path analysis results

The path analysis results were addressed in the output section of a statistical program. The researcher analyzed the path analysis results which were provided in the diagram and the table. After finish testing the proposed causal model, the researcher made an interpretation of the path results. According to Olobatuyi (2006), the researcher put the path coefficient (β) into the path diagram after testing the path. The objective was to find out the pattern of relationship between independent variables and a dependent variable. Furthermore, the researcher inspected the relationship between independent variables and read the path coefficient for each pair carefully. Path coefficient indicated the magnitude of the increasing or decreasing of the

dependent variable value when there was an increasing or decreasing of the independent variable. Thereafter, the researcher investigated the part of dependent variable which could not be explained by independent variables. The researcher counted the value of both the countable and uncountable parts of dependent variables by independent variables.

The researcher calculated the direct effects, indirect effects, and total effects (Olobatuyi, 2006). A direct effect is the magnitude of change on the dependent variable while a unit of independent variable change (Olobatuyi, 2006). The direct effect can be determined by finding the path coefficient (β) in the path analysis output (Munro, 2001). An indirect effect is the amount of change on the dependent variable which has a mediating variable, while an independent variable is changed (Olobatuyi, 2006). The way of counting indirect effect is by multiplying the path coefficients of the compound causal path (Munro, 2001). Total effect is the summation of direct effects and indirect effects in a path. The total effect can be calculated by summing all of the path coefficients between independent variables and dependent variables both direct effects and indirect effects.

CHAPTER 4

RESULTS AND DISCUSSION

This chapter provides information regarding the study results and discussion. This study aimed to develop and test a causal model of breastfeeding duration among working Muslim mothers in Central Java Province, Indonesia. Two hundred and forty mothers were recruited in this study. There are three parts in this chapter as follows:

Part I Personal characteristics of the sample and study variables

Part II Results of path analysis

Part III Discussion

Results

Part 1 Personal characteristics of the sample and study variables

Personal characteristics of the sample

The ages of the 240 mothers ranged from 22 to 42 years with a mean age of 30.93 years (*SD* = 4.16). Forty-five percent of the mothers' ages ranged from 31 – 35 years and only 4 (1.7%) mothers were more than 40 years old. For parity, forty percent of the mothers had 2 children and 36% had one child. The majority of mothers (88.3%) lived with their husbands. Half of them had completed a bachelor degree and only 4 mothers (1.7%) had completed primary school. One-fourth of the mothers were teachers (25.8%), almost one-fourth of the mothers (24.6%) were private sector employees, and 54 mothers (22.5%) were government employees. Forty-four percent of the mothers had an income more than 3,400,000 Rupiah and only 4 mothers (1.7%) had an income less than 850,000 Rupiah. The majority of the mothers perceived that their income was adequate (89.6%). There were more nuclear families (57.1%) than extended families (42.9%). Most of the relatives in the extended families were parents (51.9%).

Mothers received breastfeeding information from three major sources including midwives (63.8%), family members (51.2%), and friends (37.9%). For husbands, half of them had completed bachelor degree (50.4%) and thirty-five percent of the husbands worked in the private sector. For infants, the ages ranged from 185 to 360 days, with a median of 285 days (*QD* = 49.38). The infants' gender was nearly equal in both male (51.7%) and female (48.3%). More than half of the infants were delivered normally (61.6%). Approximately three-quarters of the mothers gave birth at the hospital (74.1%) (Table 2).

Table 2

Frequency, Percentage, Mean (M), Standard Deviation (SD), Median (Md), Quartile Deviation (QD), Minimum-Maximum, Skewness Value, and Kurtosis Value of Personal Characteristics of the Sample (N=240).

Items	Frequency	Percent
Mother		
Age (years)		
21 – 25	27	11.3
26 – 30	78	32.5
31 – 35	109	45.4
36 – 40	22	9.1
41 – 45	4	1.7
Min-max = 22 – 42 *M* = 30.93 *SD* = 4.16		
Skewness value = 0.66 Kurtosis value = -1.02		
Parity		
1	87	36.3
2	97	40.4
3	47	19.6
4	9	3.7
Marital status		
Separated	26	10.8
Lived with husband	212	88.4
Divorced	2	0.8
Education level		
Primary school	4	1.7
Junior high school	12	5
Senior high school	35	14.6
Bachelor	123	51.2
Master	29	12.1
Others	37	15.4

Table 2 *(Continued)*

Items	Frequency	Percent
Occupation		
Entrepreneur	5	2.1
Teacher	62	25.8
Bank clerk	4	1.7
Health care provider	33	13.8
Laborer	14	5.8
Seller	2	0.8
Private sector employee	59	24.6
Government employee	54	22.5
Others	7	2.9
Family income (Rupiah/month)		
< 850,000 Rupiah	4	1.7
850,000 - 1,700,000 Rupiah	29	12.1
1,700,001 - 2,550,000 Rupiah	42	17.5
2,550,001 - 3,400,000 Rupiah	59	24.5
> 3,400,000 Rupiah	106	44.2
Adequacy of income		
Adequate	215	89.6
Not Adequate	25	10.4
Family pattern		
Nuclear	137	57.1
Extended	103	42.9
If extended family, who stayed with you		
(can answer more than one)	70	51.9
Parent	23	17
Parent in law	21	15.6
Sister	6	4.4
Sister in law	15	11.1
Other		
Breastfeeding information sources: who gave advice or gave you information regarding breastfeeding (can answer more than one)		
Midwive	153	63.8
General practitioner	32	13.3
Pediatrician	81	33.7
Obstetrician and gynecologist	68	28.3
Nurse	47	19.6
Family member	123	51.2
Community health volunteer	18	7.5
Neighbor	32	13.3
Traditional birth attendant	16	6.7
Friend	91	37.9
Television	38	15.8
Others	40	16.7

Table 2 *(Continued)*

Items	Frequency	Percent
Husband		
Education level		
Primary school	5	2.1
Junior high school	5	2.1
Senior high school	49	20.4
Bachelor	121	50.4
Master	30	12.5
Doctoral	2	0.8
Others	28	11.7
Occupation		
Entrepreneur	44	18.3
Teacher	33	13.7
Bank clerk	6	2.5
Health care provider	13	5.7
Laborer	11	4.5
Private sector employee	84	35
Government employee	39	16.2
Others	10	4.1
Infant		
Age (days)		
180-210	27	11.3
211-240	31	12.9
241-270	43	17.9
271-300	36	15
301-330	27	11.2
331-360	76	31.7
Min-max = 185 – 360 *Md* = 285 *QD* = 49.38		
Skewness value = -1.29 Kurtosis value = -4.04		
Gender		
Male	124	51.7
Female	116	48.3
Type of delivery		
Normal	148	61.6
Forceps extraction	3	1.3
Vacuum extraction	2	0.8
Cesarean section	87	36.3
Place of delivery		
Hospital	178	74.1
Midwive’s clinic	58	24.2
Others	4	1.7

Study variables

The breastfeeding knowledge scores ranged from 38 – 49 with a mean of 43.50 (*SD* = 2.65). Family support scores ranged from 2.23 – 5 with a mean of 3.53 (*SD* = 0.72). Workplace support scores ranged from 2.92 – 6.92 with a mean of 5.13 (*SD* = 0.88). Attitude toward breastfeeding scores ranged from 91.12 – 312.5 with a mean of 224.50 (*SD* = 55.09). Breastfeeding problem scores ranged from 1.24 – 3.18 with a mean of 2.13 (*SD* = 0.41). Sufficient milk supply scores ranged from 3.78 – 7 with a mean of 5.85 (*SD* = 0.72). Breastfeeding initiation scores ranged from 15 – 210 hours with a mean of 95.71 hours (*SD* = 44.99). Intention to exclusive breastfeeding scores ranged from 3 – 10 with a mean of 7.54 (*SD* = 1.94). Then, breastfeeding duration scores ranged from 30 – 180 days with a mean of 103.91 days (*SD* = 43.48). All of the study variables had the skewness and kurtosis value less than ± 3.29 (Table 3).

Table 3

Possible Score, Actual Score, Mean, Standard Deviation (SD), Skewness Value and Kurtosis Value of the Study Variables (N = 240).

Variable	Possible score	Actual score	Mean	*SD*	Skewness value	Kurtosis value
1. Breastfeeding knowledge	0 – 49	38 – 49	43.50	2.65	0.803	1.719
2. Family support	1 – 5	2.23 – 5	3.53	0.72	0.293	3.016
3. Workplace support	1 – 7	2.92 – 6.92	5.13	0.88	0.650	2.754
4. Attitude toward breastfeeding	12.5 – 312.5	91.12 - 312.5	224.50	55.09	2.395	2.147
5. Breastfeeding problems	1 – 5	1.24 – 3.18	2.13	0.41	1.121	0.687
6. Sufficient milk supply	1 – 7	3.78 – 7	5.85	0.72	3.165	1.629
7. Breastfeeding initiation		15 – 210	95.71	44.99	2.700	1.881
8. Intention to breastfeed	0 – 10	3 – 10	7.54	1.94	3.280	1.735
9. Breastfeeding duration		30 – 180	103.91	43.48	1.828	3.153

Part II Results of path analysis

1) Results of correlation analysis

Before testing the path analysis, the researcher examined the correlation among study variables. All of the independent variables in this study had a significant correlation with the dependent variable. Therefore, all independent variables were included in the path analysis (Table 4).

Table 4

Correlation Matrix of the Study Variables

Variables	BK	FS	WS	ATB	BP	SMS	BI	IEB	BD
BK	1								
FS	.414**	1							
WS	.307**	.317**	1						
ATB	.413**	.335**	.245**	1					
BP	-.258**	-.238**	-.327**	-.275**	1				
SMS	.342**	.332**	.249**	.438**	-.332**	1			
BI	-.216**	-.151*	-.175*	-.312**	.071	-.184**	1		
IEB	.510**	.272**	.164*	.391**	-.149*	.319**	-.279**	1	
BD	.597**	.489**	.378**	.741**	-.398**	.527**	-.352**	.576**	1

Note. *p<.05 **p<.01 ***p<.001

BK = Breastfeeding knowledge, FS = Family support, WS = Workplace support, ATB = Attitude toward breastfeeding, BP = Breastfeeding problems, SMS = Sufficient milk supply, BI = Breastfeeding initiation, IEB = Intention to exclusively breastfeed, BD = Breastfeeding duration.

2) Results of path analysis

After all path analysis assumptions were met as previously mentioned in Chapter 3, the path analysis using a Maximum Likelihood Method were performed to test eight hypotheses. The results of testing the research hypotheses are presented as follows (Figure 5).

1. Research hypothesis 1

The first research hypothesis is the initial model fits the data. The overall model fit of the hypothesized model was judged. The hypothesized model had six exogenous variables and three endogenous variables. The hypothesized model was examined using

a computer program and the test results showed that some values were met the criteria; however, some criteria were not met (Table 5). Thus, the first research hypothesis was unacceptable.

Next, the researcher modified the hypothesized model based on the statistical and theoretical considerations. Based on the modification indices of a computer program output, the path between family support and intention to exclusive breastfeeding were not significant (the lowest non-significant path). Dropping the path between family support and intention to exclusive breastfeeding increased the values of fit indices. Justification of the model modification was also based on a previous study (Fatimah, Martini, Rostyaningtyas, &Sumarmi, 2013) in Central Java Province, Indonesia which revealed that family support did not significantly predict intention to exclusive breastfeeding among working mothers. Thus, the researcher dropped the path (family support for intention to exclusively breastfeed).

The overall model fit of the modified model after dropping one path was evaluated. The results showed that all values fit the criteria (Table 5). Thus, further interpretation of the results was based on this modified model (Figure 5).

Table 5

Comparisons of the Goodness of Fit between the Hypothesized Model and Modified Model

Test statistics	Hypothesized Model	Modified Model	Criteria of goodness of fit values
Chi-square (χ^2)	25.80 (p=.000)	16.59 (p=.035)	close to zero, p>.05 (Munro, 2001)
Relative Chi-square	3.69	2.07	≤ 3 (Munro, 2001)
NFI	.97	.99	≥ .95 (Hair et al, 2010)
NNFI	.87	.96	≥ .90 (Hair et al, 2010)
GFI	.97	.98	≥ .90 (Hair et al, 2010)
AGFI	.84	.91	≥ .90 (Tabachnick and Fidel, 2007)
CFI	.97	.99	≥ .95 (Munro, 2001)
90%RMSEA	.07, .15	.02, .11	< .08 and <.10 = acceptable fit (Hair et al, 2010)
SRMR	.06	.04	<.08 or .05 (Hair et al, 2010)

Note. NFI = Normed Fit Index, NNFI = Non-Normed Fit Index, GFI = Goodness of Fit Index, AGFI = Adjusted Goodness of Fit Index, CFI = Comparative fit index, RMSEA = Root mean square error of approximation, SRMR = Standardized Root Mean Residual

2. Research hypothesis 2

The second hypothesis examined direct effects of breastfeeding knowledge, family support, and intention to exclusive breastfeeding on breastfeeding initiation. The modified model showed that breastfeeding knowledge and intention to exclusive breastfeeding had a direct and negative effect on breastfeeding initiation (β = -.17; p < .05; β = -.22, p < .01) (Figure 5 and Table 6). In addition, family support did not significantly affect breastfeeding initiation (β = -.06, p > .05) (Figure 5 and Table 6). Therefore, the second research hypothesis was partially supported.

3. Research hypothesis 3

The third hypothesis evaluated direct effects of breastfeeding knowledge, family support, and attitude toward breastfeeding on intention to exclusive breastfeeding. The modified model dropped the path between family support and intention to exclusive breastfeeding. In addition, breastfeeding knowledge and attitude

toward breastfeeding affected intention to exclusive breastfeeding directly and positively (β = .42; β = .22, all p < .001, respectively) (Figure 5 and Table 6). Therefore, the third research hypothesis was partially supported.

4. Research hypothesis 4

The fourth hypothesis tested the direct effects of breastfeeding knowledge, family support, workplace support, attitude toward breastfeeding, sufficient milk supply, and intention to exclusive breastfeeding on breastfeeding duration. The modified model presented breastfeeding knowledge, family support, workplace support, attitude toward breastfeeding, sufficient milk supply, and intention to exclusive breastfeeding affected directly and positively on breastfeeding duration (β = .26, p < .001; β = .13, p < .001; β = .07, p < .05; β = .49, p < .001; β = .11, p < .01; β = .23, p < .001, respectively) (Figure 5 and Table 6). Therefore, the fourth research hypothesis was supported.

5. Research hypothesis 5

The fifth hypothesis proposed that breastfeeding problems and breastfeeding initiation have direct effects on breastfeeding duration. The modified model showed that breastfeeding problems affected breastfeeding duration directly and negatively (β = -.11, p < .01) and breastfeeding initiation did not affect breastfeeding duration directly and negatively (β = -.06, p > .05) (Figure 5 and Table 6). Therefore, the fifth research hypothesis was partialy supported.

6. Research hypothesis 6

The sixth hypothesis evaluated the mediating effect of breastfeeding initiation on the relationships between breastfeeding knowledge and breastfeeding duration, family support and breastfeeding duration, and intention to exclusive breastfeeding and breastfeeding duration. The indirect effect can be calculated by multiplying the path

coefficient of the compound causal path manually or get the indirect effect in the output of a computer program. The path analysis results showed breastfeeding knowledge, family support, and intention to exclusive breastfeeding did not significantly have indirect and positive effects on breastfeeding duration through breastfeeding initiation (β = -.01, p > .05; β = .00, p > .05; β = .01, p > .05, respectively) (Figure 5 and Table 6). Therefore, the sixth research hypothesis was not supported.

7. Research hypothesis 7

The seventh hypothesis examined the mediating effect of intention to exclusive breastfeeding on the relationships between breastfeeding knowledge, family support, attitude toward breastfeeding and breastfeeding initiation. The modified model showed breastfeeding knowledge and attitude toward breastfeeding affected breastfeeding initiation indirectly and negatively through intention to exclusive breastfeeding (β = -.01, p < .01; β = -.01, p < .01) (Table 6). The path between family support and intention to exclusive breastfeeding was dropped in the modified model. Therefore, the seventh research hypothesis was partially supported.

8. Research hypothesis 8

The eighth hypothesis tested the mediating effect of intention to exclusive breastfeeding on the relationships between breastfeeding knowledge and breastfeeding duration and attitude toward breastfeeding and breastfeeding duration. The modified model showed breastfeeding knowledge and attitude toward breastfeeding significantly affected breastfeeding duration indirectly and positively through intention to exclusive breastfeeding (β = .10, p < .001; β = .05, p < .01) (Table 6). Therefore, the eighth research hypothesis was supported.

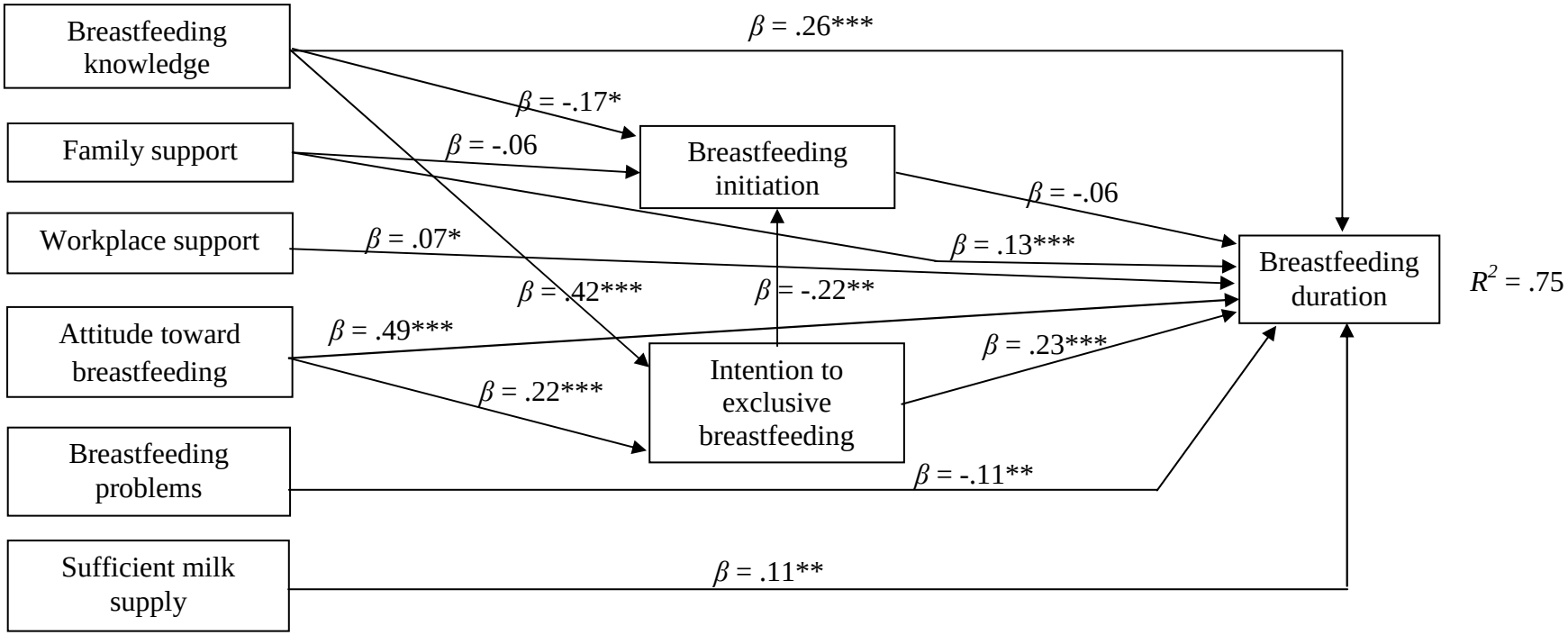

Figure 5. A Modified Causal Model of Breastfeeding Duration among Working Muslim Mothers in Central Java Province, Indonesia
Note. Model fit indices: χ^2 (8, n = 240) = 16.59, p = .035; χ^2/df = 2.07; NFI = .99; NNFI = .96; GFI = .98; AGFI = .91; RSMEA = .02; 0.11; SRMR = .037

9. Direct effects, indirect effects, and total effects in the modified model

The direct, indirect, and total effects of the modified model are presented in Table 6. The direct and indirect effects were mentioned in research hypotheses 2 – 8. All of total effects had a significant values, except breastfeeding initiation on breastfeeding duration and family support on breastfeeding initiation. The total effects of first three highest magnitude of coefficients were as follows. The total effect of attitude toward breastfeeding on breastfeeding duration was .54 ($p < .001$). The total effect of breastfeeding knowledge on intention to exclusive breastfeeding was .42 ($p < .001$).The total effect of breastfeeding knowledge on breastfeeding duration was .36 ($p < .001$).

Table 6

The Direct, Indirect, and Total Effects of the Modified Model

Paths	Direct effects	Indirect effects	Total effects
BK→ BI	-.17*	-.01	-.18*
BK →IEB	.42***	.00	.42***
BK→ BD	.26***	.10***	.36***
FS→ BI	-.06	.00	-.06
FS→BD	.13***	.00	.13***
WS→BD	.07*	.00	.07*
ATB→IEB	.22***	.00	.22**
ATB→BD	.49***	.05*	.54***
BI→BD	-.06	.00	-.06
IEB→BI	-.22**	.00	-.22**
IEB→BD	.23***	.01	.24***
BP→BD	-.11**	.00	-.11**
SMS→ BD	.11**	.00	.11**

*$p<.05$ **$p<.01$ ***$p<.001$

Note. BK = Breastfeeding knowledge, FS = Family support, WS = Workplace support, ATB = Attitude toward breastfeeding, BP = Breastfeeding problems, SMS = Sufficient milk supply, BI = Breastfeeding initiation, IEB = Intention to exclusively breastfeed, BD = Breastfeeding duration

Part III Discussion

The discussion section is divided into two parts: 1) Personal characteristics and 2) The research test results of the hypotheses.

1. Personal characteristics

The ages of the mothers ranged from 22 – 42 years, the mean of age was 30.93 years, and two-thirds of the mothers were 26 – 35 years old (77.9%). The age range of the mothers in this study was similar to the number of woman in Central Java Province in which the majority of the working women are in the reproductive age (Central Java Province Statistical Bureau, 2013).The finding of this study was consistent with the results of a previous study which was conducted by Fatimah, Martini, Rostyaningtyas, and Soemarmi (2013). Their study recruited working mothers and found that 74.7% of these mothers were in the reproductive age. The age of the mothers ranged from 23 – 42 years and the mean age was 31.2 years (Fatimah et al., 2013). Another study by Kartikasari and Afifah (2009) found that the age range of 75% of the mothers was 20 – 35 years. Numerous studies revealed that older mothers were more likely to breastfeed compared with younger mothers (Callen & Pinelli, 2004; Kehler et al., 2009; Millar & Maclean, 2005; Tarkka et al., 2001). The psychological development of adolescent mothers can interfere with the breastfeeding process which is one of the maternal tasks after delivery (Lowdermilk et al., 2000).

For parity, 97 mothers (40.4%) in this study had 2 children. The study finding was consistent with the data from Statistics Indonesia (2012a) which reported that the total fertility rate among Indonesian woman was 2.3. It shows that the average number of children in an Indonesian family is 2. A previous study by Hidayanti and Lina (2014) found that the majority of mothers in their study had two children. The proportion of multiparous and primiparous mothers in this study was nearly equal, so that the findings in this study can be generalized for both multiparous and primiparous mothers. A study revealed that multiparous mothers were more likely to breastfeed compared with primiparous mothers (Jessri, Farmer, Maximova, Willows, & Bell, 2013).

Multiparous mothers had experienced breastfeeding for the previous child that may influence the current infant breastfeeding duration (Lowdermilk et al., 2000).

The majority of mothers (88.4%) lived with their husbands. It is not surprising that the majority of mothers lived together with their husbands. In the Central Java culture, a woman has to stay with her husband after marriage. Living together with the husband may influence the breastfeeding duration. Evidence showed that family support had a significant effect on the breastfeeding duration (Biswas, 2010). The husband may help the lactating mother take care of another child, do the household work, help the mother feel comfortable, massage the mother, and feed the infant during working hours (Februhartanty et al., 2006).

A high education level may influence a mother to adapt to the breastfeeding journey. Half of the mothers had completed a bachelor degree and only 4 mothers (1.7%) had completed a primary school. This finding was not surprising since this study was conducted among working mothers who would generally have a higher education compared to mothers who stay at home. The study finding was consistent with several previous studies. A study by Umar, Abdullah, and Prawirodihardjo (2013) among working mothers in Indonesia found that ninety percent of mothers in their study had a bachelor degree. The higher educational level of the mothers might be expected as they were working mothers. A woman should have completed at least senior high school to be a female employee. In the Umar et al. (2013) study, more mothers graduated with a bachelor level compared with mothers in this study. It might due to more government employees (77.1%) in the Umar et al. (2013) study compared to this study. Becoming a government employee requires a higher level of education compared to a private sector employee. The education level influences the individual's ability regarding problem solving and how to deal with problems

(Koeske & Koeske, 1990). Much evidence revealed that a higher level of education significantly affected the intention to exclusively breastfeed, breastfeeding initiation, and breastfeeding duration (Jessri et al., 2013).

In terms of occupation, one-fourth of the mothers were teachers (25.8%), another one-fourth of the mothers (24.6%) were private sector employees, and 54 mothers (22.5%) were government employees. This study finding was consistent with the Central Statistical Bureau (2010) which mentioned that 30.63% of the manpower was working in the private sector. A study by Hakim (2012) revealed that 28.8% of the mothers were private sector employees and 23.1% of the mothers were government employees. In addition, Rejeki (2009) also found that 33.3% of the mothers in her study worked in the private sector. This is not surprising since this study was conducted in Semarang City which is an education, business and economic center and where factories are located in Central Java Province.

The percentage of mothers who had an income more than 3,400,000 Rupiah was 44.2% and the majority of mothers (89.6%) perceived that their income was adequate. Based on the Central Statistical Bureau (2010) data, the average employee income in Central Java Province was 981,047 Rupiah. In addition, the contribution of income from mothers in Central Java Province was nearly half of the total family income (44.01%) (Kusumastuti, 2012). The majority of mothers in this study had family income more than the average income in Central Java Province. It was not surprising because mothers in this study were working mothers so their families had two income sources (from themselves and their husbands). The adequacy of income may influence the ability to access better information regarding breastfeeding, buy their own breast milk pumping and storage tools, and select the best hospital during antenatal care and delivery. This study revealed that 89.6% of mothers reported an

adequate income. The finding in this study was consistent with a previous study in Indonesia. Yuliandarin (2009) found that 88.2% of mothers in her study had an adequate income. Therefore, the income of mothers in this study was similar to that of the previous study.

It is important to assess the family pattern because it is associated with social support sources. There were more nuclear families (57.1%) than extended families (42.9%). The findings were not surprising because this study was conducted in the capital city of Central Java Province. The trend of the family pattern in the capital city is a nuclear family. This study finding was consistent with the data from the Central Statistics Bureau (2010) in terms of the average number of family members per home in Central Java Province which is 3.82. Most of the relatives in an extended family were parents (51.9%). In Javanese culture, some families stay with their parents when they do not yet have a home or they ask their parent (grandmother) to stay with them. The grandmother and grandfather prefer to grow old together with their children and grandchildren. When the grandmother is still strong enough, she is involved in taking care of her grandchildren. Evidence revealed that a grandmother significantly influenced the infant's care, especially the decision making for the infant's feeding (Inayati et al., 2012). Therefore, the family pattern of the mothers in this study was similar to the findings of the previous studies.

Furthermore, mothers received breastfeeding information from various sources. The three most important sources were midwives (63.8%), family members (51.2%), and friends (37.9%). These study findings were not surprising. A previous study by Hidayanti and Lina (2014) found that 82% of mothers took antenatal care and gave birth in a midwife's clinic. In Indonesia, a midwife has a significant role in perinatal care. Mothers have prenatal care at a midwife's clinic, primary health center, or an

antenatal care unit in a hospital. For a high risk pregnancy, a midwife refers the mother to an obstetrician. Therefore, most mothers received information regarding breastfeeding from a midwife (Darwani, 2012). This study finding was consistent with the Central Java Ministry of Health (2012) data which reported that 92.99% of mothers received prenatal care from health care providers.

In the Indonesian culture, family members have a close relationship. Family members help each other. After delivery, there is a ritual to welcome the baby. It is called ‘aqiqah. At that moment, all of the family members come to help prepare and enjoy the ritual. Some of the family members (particularly a sister or grandmother) stay in the mother’s postpartum home until the mother is strong enough to take care of the baby on her own. In some families, a mother is asked to stay with her parent or sister during the postpartum period. Family members also provide information regarding postpartum adaptation which includes breastfeeding (Darwani, 2012). Working mothers have a wide social interaction with their colleagues. They share any experience regarding motherhood, including breastfeeding (Rejeki, 2009). Therefore, the sources of breastfeeding information in the mothers of this study were similar to those of the findings in previous studies.

For husbands, half of them had completed a bachelor degree (50.4%) and the majority of husbands worked in the private sector (35%). It was not surprising that the majority of the husband’s educational level was a bachelor degree. Employees in the formal sector reached a higher educational level compared to employees who were working in a non-formal sector. The findings of this study were consistent with the Central Statistical Bureau (2010) which stated that the majority of the manpower worked in the private sector. This study was conducted in Semarang City which is the center of trading and location of factories in Central Java Province. A husband who

has a higher education level may impart better knowledge and attitude toward breastfeeding and as a result the husband supports his wife to breastfeed exclusively (Dennis, 2006).

For the infants, the ages ranged from 185 to 360 days. The median of infant age was 285 days and the infant gender was nearly equal in both male (51.75%) and female (48.3%). This study finding was consistent with the data from Central Java Ministry of Health (2012) which reported that 50.75% of the infants in Central Java Province were male. A previous study by Nugraheni (2011) found that 59.7% of the infants in her study were male. This study finding can be generalized in both male and female infants. The majority of infants were delivered normally (61.6%) and approximately three-quarters of the mothers gave birth at a hospital (74.1%). This study finding was consistent with the Central Java Ministry of Health (2012) data in which three-quarters of mothers had a normal delivery (73.9%) and nearly all mothers received assistance during delivery from health providers including midwife and obstetrician (97.14%) (Central Java Ministry of Health, 2012). A previous study found that 75.8% of mothers gave birth normally (Hidayanti & Lina, 2014) and 52% delivered at a hospital (Hidayat, 2012). Therefore, the place of delivery of mothers in this study was similar to the findings in previous studies.

The type of delivery has a significant impact on breastfeeding initiation, EBF duration, and overall breastfeeding duration. Post cesarean section mothers were less likely to initiate breastfeding (Romero-Gwynn & Carias, 1989), had shorter EBF duration (Jahangeer, Khan, & Khan, 2009), and had shorter breastfeeding duration (J.A. Scott & Binns, 1999) comparing to normal delivery mothers. The rationale of delaying breastfeeding initiation might be due to maternal and infant condition post caesarean sections are too poor to be performed breastfeeding initiation. Another

contributing factor is hospital policy regarding breastfeeding initiation among post caesarean section mothers. Opeating room is very cold, so a hospital may have a policy to delay breastfeeding initiation until both mother and infant in a stabile condition and refered into a postpartum ward which the air is warmer. This study includes normal delivery, forceps extraction, vacuum extraction, and cesarean section, so this study can be generalized among all types of delivery.

2. Results of the research hypotheses

A discussion of the results of the research hypotheses in this study is presented as follows.

2.1 The model fit

A causal model provides the best evidence of the relationships among the variables. The first hypothesis was a fit of the model with the empirical data. The model development was based on a literature review. This study examined a set of causal relationships among independent and dependent variables. The researcher selected the Theory of Planned Behavior (Ajzen, 1991) as the main study framework but all of the intention predictors were not included. Based on the literature review, this study only selected knowledge, attitude toward behavior, intention, and behavior. There is no evidence to include subjective norm and perceived control in this study. Then, the researcher added five more variables as guided by empirical evidence. There are no previous studies which examined the combination of these variables. The previous studies regarding breastfeeding duration were conducted in the United States and Hong Kong. All of the previous studies were conducted in non-Muslim and developed countries. The predictors of breastfeeding duration may be different in the Muslim population.

Three previous studies examined the causal model of breastfeeding duration among mothers in the United States (Duckett et al., 1998; Wambach, 1997) and Hong Kong (Dodgson et al., 2003). All of these studies evaluated and modified the Theory of Planned Behavior. Comparing the three previous causal models, these studies have some similarities and differences. The similarities of this study with those three previous causal models were the model development based on the TPB and empirical evidence, recruited postpartum mothers, and selected breastfeeding duration as the dependent variable. This study added five more variables besides the TPB. Duckett al. (1998) and Dodgson, et al. (2003) also added some variables in their model. Duckett al. (1998) added insufficient milk supply and maternal education as variables. Dodgson, et al. (2003) added proximity index, antecedents, and difficulties as variables.

The differences between this study and the Duckett et al. (1998) study were that they included three first time mother groups: homemaker mothers (n = 180), mothers who worked less time (n = 110), and mothers who worked more time (n = 312). Furthermore, Dodgson et al. (2003) replicated Duckett et al.'s study (1998) with Hong Kong first time mothers (n = 239). There are differences between this study and the study by Dodgson et al. (2003). They recruited first time mothers and examined three models: the strict Theory of Planned Behavior model, the modified Minnesota Theory of Planned Behavior for women employed more than 20 hours per week model, and the Theory of Planned Behavior perceived control mediated model. In addition, the differences between this study and the Wambah's study (1997) was she examined the strict TPB model.

In addition, all of the previous studies were conducted in developed countries and non-Muslim majorities. This study recruited only Muslim mothers as the study respondents. The hypothesized model was examined among 240 lactating working

Muslim mothers in Central Java Province, Indonesia. Dodgson, et al. (2003) recruited 239 first time mothers in Hong Kong, Duckett et al.(1998) recruited 602 first time mothers in the USA, and Wambach (1997) recruited 135 first time mothers in Kansas, USA.

The path analysis results in this study showed that all eight independent variables significant accounted for 75% of the variance in the breastfeeding duration (R^2 = .75). Duckett at al. (1998) found the R^2 value of the model in their study was .38. Wambach's study (1998) revealed that the R^2 of the model was .04. In addition, Dodgson et al.'s study (2003) mentioned the R^2 value of the model was .36.

The path analysis results in this study showed that the hypothesized model did not fit with the empirical data. Some of the hypothesized model test results in this study did not meet the goodness of fit criteria. Duckett et al. (1998) examined five hypothesized models in their study in three groups and they mentioned the path coefficient values, the function value, Akaike Information Criterion (*AIC*), *GFI*, *RMSEA*, and R^2. Dodgson, et al. (2003) examined three models among first time mothers in Hong Kong and they provided the values of *GFI* and *SRMR*. In addition, Wambach (1997) examined one model and mentioned the R^2 value. Duckett et al. (1998) and Dodgson, et al. (2003) selected the best model based on the test result at this step. They did not modify and re-test the model. The previous studies did not completely report the value of the model fit statistics.

Afterwards, the researcher modified the model based on the statistical and theoretical considerations. The researcher dropped the lowest non-significant path in the hypothesized model (a path from family support with intention to exclusively breastfeed). The modified model consisted of 13 paths. The dropping of a non-significant path coefficient was based on the modification indices and a previous

study (Fatimah et al., 2013) which revealed that family support did not affect intention to exclusively breastfeed. There were no reports regarding the model modification process in the Duckett et al. (1998) and Dodgson, et al. (2003) studies. In addition, Wambach (1997) modified the model in her study by dropping the non-significant path between subjective norm and breastfeeding intention.

Then, the modified model was tested using a computer program. The overall model fit of the modified model after dropping one path was evaluated. The results showed that all values met the criteria of fit indices, so the modified model was fit with the empirical data. The modification was stopped since the values of Goodness of Fit Indices in the modified model met all of the criteria. The previous studies only mentioned some values of model fit statistics. Duckett et al. (1998) selected the fifth model as the best model in their study. The fifth model test results in Duckett et al. (1998)'s study had a satisfactory goodness of fit indices. The goodness-of-fit index (*GFI*) of those three models were .95, .94, and .97 for the homemaker, employed less time, and employed more time groups, respectively (Duckett et al., 1998). All path analysis results were significant except for two (i.e., the path from subjective norm to attitude toward breastfeeding in the employed less group, and the path from breastfeeding knowledge to attitude toward bottle feeding in the homemaker group) (Duckett et al., 1998). Dodgson, et al. (2003)'s study found that the modified Minnesota theory of planned behavior-breastfeeding for employed women model and the Theory of Planned Behavior perceived control mediated model had satisfactory goodness of fit indices (*GFI* = .94 and .95, respectively). However, the strict Theory of Planned Behavior had unsatisfactory goodness of fit indices (*GFI* = .85). Wambach (1997) did not report the results of goodness of fit indices in her study.

There were some similarities and differences between this study and previous studies. The similarities between this study and Duckett et al.'s (1998) study were using of four variables from TPB; breastfeeding knowledge, attitude toward breastfeeding, intention to exclusively breastfeed, and breastfeeding duration and from empirical evidence; sufficient milk supply (Duckett et al., 1998) and breastfeeding problems (Dodgson et al., 2003). The differences between this study and Duckett et al.'s (1998) study were this study had another mediating variables; breastfeeding initiation, this study include only modifiable variables which did not included in Duckett et al.'s (1998) study, such as family support, workplace support, and breastfeeding problems. Another difference was the variables which mediated by intention. In this study, intention to exclusive breastfeeding mediated breastfeeding knowledge and attitude toward breastfeeding on breastfeeding duration.

This study only had one hypothesized model (Figure 1). Whereas Duckett et al.'s (1998) study had three hypothesized models; homemakers, work less time, and work more time. In homemakers model, breast-feeding intention mediated bottle feeding attitude, breastfeeding attitude, and perceived control on breastfeeding duration. In work more time model, breast-feeding intention mediated bottle feeding attitude, breast-feeding attitude, and perceived control on breastfeeding duration (Duckett et al., 1998). In work less time model, breastfeeding intention mediated bottle feeding attitude, breastfeeding attitude, and perceived control on breastfeeding duration (Duckett et al., 1998). In Dodgson et al.'s (2003) study had three hypothesized models; modified TPB model, replication with modifications of TPB-BrF model for employed women, and TPB perceived control mediated model. In modified TPB model, breastfeeding intention mediated bottle feeding attitude, breastfeeding attitude, subjective norm, and perceived control on breastfeeding

duration. In replication with modifications of TPB-BrF model for employed women breastfeeding intention mediated bottle feeding attitude, breastfeeding attitude, subjective norm, perceived control, and proximity index on breastfeeding duration. In TPB perceived control mediated model breastfeeding intention mediated perceived control on breastfeeding duration.

In the hypothesized model, this study had 14 paths among variables, while Dodgson et al.'s (2003) study had 14 paths in TPB model and 22 paths in Minnesota TPB-BrF Model for women employed more than 20 hours per week. In addition, Duckett et al.'s (1998) study had 21 paths in the model. The hypothesized models in Dodgson et al.'s (2003) and Duckett et al.'s (1998) studies used all variables in the Theory of Planned Behavior and this study only selected and examined four variables from the Theory of Planned Behavior based on previous studies results. This study omitted subjective norm and perceived behavior control since there were no evidence to include those variables.

The overall modified model in this study provided new evidence regarding a causal relationship of breastfeeding duration predictors among working Muslim mothers in Central Java Province, Indonesia. Comparing to previous models, this study selected only modifiable variables, had two mediating variables (e.g., breastfeeding initiation and intention to exclusive breastfeeding), had six independent variables (e.g., breastfeeding knowledge, family support, workplace support, breastfeeding problems, and sufficient milk supply) and one dependent variable (e.g., breastfeeding duration). In the other hand, Duckett et al.'s (1998) model selected one non-modifiable independent variable (e.g., maternal education), four modifiable independent variables (e.g., breastfeeding knowledge, bottle feeding attitude, breastfeeding attitude, and perceived control), one mediating variable (e.g.,

breastfeeding intention), and one dependent variable (e.g., breastfeeding duration). Dodgson et al.'s (2003) model selected two non-modifiable independent variables (e.g., antecedents and proximity index), eight modifiable independent variables (e.g., bottle feeding attitude, breastfeeding attitude, subjective norm, perceived control, beliefs about outcomes of formula feeding, beliefs about outcomes of breastfeeding, referent beliefs, and control beliefs), one mediating variable (e.g., breastfeeding intention), and one dependent variable (e.g., breastfeeding duration).

In the modified model, this study had 11 significant paths and 2 non-significant paths. The non-significant path was family support on breastfeeding initiation and breastfeeding initiation on breastfeeding duration. Duckett et al.'s (1998) study had 15 significant paths in homemakers model, 19 significant paths in work less time model, and 21 significant paths in work more time model. While Dodgson et al.'s (2003) study had 10 significant paths and 6 non-significant paths in the modified TPB model, 13 significant paths and 10 non-significant paths in the replication with modifications of the TPB-BrF model for employed women, 13 significant paths in the TPB perceived mediated model.

In this study, attitude toward behavior was the strongest predictor of breastfeeding duration followed by breastfeeding knowledge and intention to exclusively breastfeed. In Duckett at al.'s (1998) study, intention was the strongest predictor of breastfeeding duration followed by insufficient milk in the homemakers model. In work less time and work more time model, intention was the strongest predictor of breastfeeding duration followed by breastfeeding knowledge, maternal education, and bottle feeding attitude. This study and Duckett et al.'s (1998) study had three similar variables which had a direct and positive effect on breastfeeding duration, (e.g., intention, breastfeeding knowledge, and attitude). In Dodgson et al.'s

(2003) study, intention was the strongest predictor of breastfeeding duration followed by difficulties and proximity index in all three models. This study and Dodgson et al.'s (1998) study had one similar variable which had a direct and positive effect on breastfeeding duration and it was intention.

In this study, intention to exclusive breastfeeding mediated breastfeeding knowledge and attitude toward breastfeeding significantly and positively on breastfeeding duration. In Duckett at al.'s (1998) study, intention to exclusive breastfeeding had higher correlation with attitude toward breastfeeding and perceived behavioral control comparing to subjective norm. Intention mediated bottle feeding attitude, breastfeeding attitude, and perceived control. In Dodgson et al.'s (2003) study, intention to exclusive breastfeeding mediated formula feeding attitude, breastfeeding attitude, subjective norm, and perceived control on breastfeeding duration in the Modified TPB Model. In the Replication with Modification of TPB-BrF Model for Employed Women, intention to exclusive breastfeeding mediated formula feeding attitude, breastfeeding attitude, and perceived control on breastfeeding duration. In TPB Perceived Control Mediated Model, intention to exclusive breastfeeding mediated formula feeding attitude, breastfeeding attitude, subjective norm, and perceived control on breastfeeding duration. The similarity between this study and previous studies model was the mediating effect of intention on attitude and breastfeeding duration.

This study had low magnitude path between workplace support ($\beta = .07$, $p < .05$) on breastfeeding duration. The possible reason was that the workplace did not provide a break time and convenience place for lactating female employee to breastfeed or express breastmilk. In this study, 73% of respondents reported that their workplace did not have break time and did not provide a special and suitable room for

the female employee to pumping their breastmilk. From Basrowi's (2013) study, 78% of labor and 50% of government and private sector employees did not breastfed their infants exclusively. It may be concluded that the workplace support in Indonesia was still not good enough. In this study, mothers might received a little or insufficient support from the workplace and mothers who breastfeed exclusively might be influenced by other high significant contributing factors, such as have a high breastfeeding knowledge, great family support, positive attitude toward breastfeeding, less breastfeeding problems, perceived sufficient breastmilk supply, and high intention to exclusively breastfeed.

2.2 Direct effect of breastfeeding knowledge, family support, and intention to exclusive breastfeeding on breastfeeding initiation

The second hypothesis examined the direct effect of breastfeeding knowledge, family support, and intention to exclusive breastfeeding on breastfeeding initiation. The modified model showed that breastfeeding knowledge and intention to exclusive breastfeeding had a direct and negative effect on breastfeeding initiation (β = -.17; $p < .05$; β = -.22, $p < .01$). However, family support did not significantly affect breastfeeding initiation (β = -.06, $p > .05$). Possible reasons for partially support of the second hypothesis are explained as follows.

2.2.1 Effect of knowledge on breastfeeding initiation

The Theory of Planned Behavior proposed knowledge is one of the antecedents of behavior predictors (Ajzen, 1991). Knowledge forms the belief that eventually affects intention and actual behavior (Ajzen, Joyce, Sheikh, & Cote, 2011). In addition, several previous studies examined the predictive factors of breastfeeding initiation. Evidence showed that breastfeeding knowledge predicted breastfeeding initiation directly and significantly (Gijsbers et al., 2006; Hidayat & Dewantiningrum,

2012; Nastiti, 2013). This study examined the ability of breastfeeding knowledge to predict breastfeeding initiation directly.

The path analysis results showed breastfeeding knowledge significantly affect breastfeeding initiation directly and negatively (β = -.17, p < .05). It means that the higher breastfeeding knowledge creates the earlier breastfeeding initiation. The result of this study was consistent with previous studies results. A study among Indonesian mothers revealed that breastfeeding knowledge influenced breastfeeding initiation (*OR* = 1.62, 95%*CI* = 1.03 – 2 .54) (Hidayat & Dewantiningrum, 2012). Indonesian mothers who had greater breastfeeding knowledge were 1.6 times more likely to initiate breastfeeding compared to mothers who had less breastfeeding knowledge (Hidayat & Dewantiningrum, 2012). A study conducted by Nastiti (2013) in Indonesia also revealed that breastfeeding knowledge had a significant correlation with breastfeeding initiation (χ^2 = 15.33, p < .05). Similarly, a study in the Netherlands revealed that breastfeeding knowledge significantly predicted breastfeeding initiation (β = .18, p < .05) (Gijsbers et al., 2006).

The effect of breastfeeding knowledge on breastfeeding initiation was inconsistent. This study finding was not consistent with the Virarisca, Dasuki, and Sofoewan (2010) study. They assessed the factors correlated to early breastfeeding initiation in Jogjakarta, Indonesia. They also found that breastfeeding knowledge did not have a significant correlation with breastfeeding initiation (χ^2 = .03, p > .05). Another study that examined the correlation between breastfeeding knowledge and breastfeeding initiation in Indonesia was conducted by Nugraheni (2011). That study revealed that there was no significant correlation between breastfeeding knowledge and breastfeeding initiation (r = .52, p = .84) (Nugraheni, 2011). In addition, a study by Adiyasa (2014) also found that breastfeeding knowledge did not have a significant

correlation with breastfeeding initiation in Indonesia (χ^2 = .87, p > .05). According to Ajzen et al. (2011), although information is important, information only cannot produce an expected behavior. In a critical analysis, an individual needs not only knowledge but also the intention to perform a behavior (Ajzen et al., 2011). Several studies revealed that only knowledge failed to predict the behavior (Ajzen et al., 2011).

2.2.2 Effect of family support on breastfeeding initiation

Family support is derived from social support theory. According to Cohen (2004), social support is defined as the assistance from others to help the individual solve the problems. The assistance may be categorized into four parts including emotional, informational, appraisal, and instrumental support (House, 1981). The social support which comes from family members is called family support (Biswas, 2010). Previous studies also found that family support was significantly associated with breastfeeding initiation (Biswas, 2010; L. Li et al., 2004; J. A. Scott & Binns, 1999). This study examined the ability of family support to predict breastfeeding initiation.

The result of this study was somewhat surprising. The path analysis result also revealed that family support did not significantly affect breastfeeding initiation (β = -.06, p > .05). The study finding was congruent with some recent studies. According to Nastiti (2013), family support did not have a significant correlation with breastfeeding initiation (χ^2 = .75, p > .05). Another study in Indonesia (Adiyasa, 2014) also found that family support did not have a significant correlation with breastfeeding initiation (χ^2 = .34, p > .05).

This study finding was not congruent with previous studies. According to L. Li et al. (2004) and J. A. Scott and Binns (1999), family support was the major factor that influenced breastfeeding initiation among Australian mothers. The father's support positively influenced breastfeeding initiation of Chinese mothers who gave birth in Australia (*OR* = 4.96; 95%*CI* = 1.93 - 12.66) (L. Li et al., 2004). This study finding was also not congruent with a study in Indonesia. The previous study found that family support was significantly correlated with breastfeeding initiation ($\chi^2 = 8.167$, $p < .05$) (Suryani & Mularsih, 2010).

The rationale of the difference between the results of this study and the results of the Suryani and Mularsih (2010) study might be due to the place of delivery. Suryani and Mularsih (2010) conducted their study in a midwife clinic, whereas almost two-thirds of the mothers in this study gave birth at a hospital. In a midwife clinic, family members can stay with the mother during delivery. They help the mother eat, drink, go to the toilet, and other activities during the intrapartum and postpartum periods. Consequently, family members play a significant role in breastfeeding initiation. In the hospital, family members are not permitted to stay with the mother in the delivery room. They wait for the delivery process in front of the delivery room. They are called by the health care providers after completion of the delivery process. The mothers stay in the delivery room from the intrapartum period up to two hours after delivery. After two hours of delivery, the postpartum mother and her infant are transferred to a postpartum ward. The family members are permitted to visit the mother and her infant in the postpartum ward. So, family members do not have a significant role in breastfeeding initiation when the mother gives birth in a hospital.

The possible reason is that a postpartum mother should stay in the delivery room up to two hours after giving birth. The postpartum mother is monitored for vital signs, urine output, bowel activity, lochia, and postpartum emergency signs, such as postpartum hemorrhage, delayed uterine involution, high blood pressure, fatigue, thrombophlebitis, etc. Family members do not stay in the delivery room with the mother. Breastfeeding initiation is performed within one hour after delivery. Thus, the family members do not participate in the mother's breastfeeding initiation. After two hours, postpartum mothers are moved to a postpartum ward with her infant. The family members are permitted to visit postpartum mothers and their infants in the postpartum ward. Therefore, the health care providers play a significant role in the breastfeeding initiation. Consequently, there are several factors that influence breastfeeding initiation in the hospital, such as the health care provider's knowledge regarding breastfeeding initiation (Rahardjo, 2014), health care provider's attitude toward breastfeeding initiation (Daryati, 2008; Susanti, 2011), and the hospital policy regarding breastfeeding initiation (Kadir, 2014).

Another possible reason is this study involved mothers with several types of delivery. Some mothers in this study gave birth via cesarean section. Previous studies found that mothers who gave birth normally were more likely to initiate breastfeeding, intent to exclusively breastfeed, and breastfeed longer duration comparing to mothers who delivered via a cesarean section. The policy regarding breastfeeding initiation might affect the breastfeeding initiation among post partum mothers. The Indonesian government had regulated breastfeeding initiation since 2006. The Indonesian government encouraged health care providers to facilitate every mother performing breastfeeding initiation by providing several breastfeeding initiation workshop for

health care provider and launching a baby friendly hospital program in each hospital to support breastfeeding initiation (Kristiyansari, 2009).

Hospitals which have baby friendly hospital program have to encourage health care providers to facilitate the breastfeeding initiation within the first hour after birth. So, a baby friendly hospital policy in a hospital takes an important role in breastfeeding initiation. However, the breastfeeding initiation rate is still low. Only 10% of Indonesian mothers performed breastfeeding initiation (Statistics Indonesia, 2007). In Central Java Province, not all of hospitals which have a baby friendly hospital policy so the health care providers less aware regarding breastfeeding initiation. Furthermore, not all of hospitals in Central Java Province have a rooming in policy. So, mother and her infant stay in a different room during hospitalized. In addition, kangaroo mother care did not implemented at hospitals. Breastfeeding initiation is not only predicted by the mothers' knowledge regarding breastfeeding initiation but also other factors. In this study, breastfeeding initiation may be predicted by type of delivery, delivery assistance, health provider support, maternal physical and psychological condition (Virarisca et al., 2010), midwife's knowledge, attitude, and length of working (Widiastuti, Rejeki, & Khamidah, 2013), maternal disease, infant's disease, and the hospital policy regarding breastfeeding initiation (Aprillia, 2010).

2.2.3 Effect of intention to exclusive breastfeeding on breastfeeding initiation

As proposed by Ajzen (1991), intention is the main factor of a human behavior. Intention stimulates the individual to perform a specific behavior (Ajzen, 1991). The intention to breastfeed motivates a mother to initiate breastfeeding within the first hour after delivery (Donath & Amir, 2003; Herndon, 2014). This study

examined the predictive ability of intention to exclusive breastfeeding on breastfeeding initiation.

The results of this study supported the TPB and previous study findings. As expected, intention to exclusive breastfeeding had a direct and negative effect on breastfeeding initiation (β = -.22, p < .01). A greater intention to exclusive breastfeeding caused early breastfeeding initiation. The association between intention to breastfeed and breastfeeding initiation was consistent with the previous study results in Australia and the United States. A large population study in Australia by Donath and Amir (2003) found that mothers who intended to breastfeed were more likely to initiate breastfeeding compared to those who did not intend to breastfeed. The variance of intention to breastfeed accounts for 91.4% of the variance in the breastfeeding initiation. Another study in the United States by Herndon (2014) also found a significant relationship between intention to breastfeed and breastfeeding initiation among American mothers.

The correlation between intention to breastfeed and breastfeeding initiation in Indonesia was inconsistent. A study by Nastiti (2013) revealed that intention to breastfeed did not have a significant correlation with breastfeeding initiation in Indonesia (χ^2 = .61, p > .05). The possible reason is the education level in the majority of mothers in this study was a bachelor degree, whereas the education level in the majority of mothers in the Nastiti (2013) study was senior high school. Evidence showed that a higher level of education created greater intention to breastfeed (Humphreys et al., 2002) and earlier breastfeeding initiation (Celi, et al., 2005; L. Li et al., 2004).

2.3 Direct effect of breastfeeding knowledge, family support, and attitude toward breastfeeding on intention to exclusive breastfeeding

The third research hypothesis proposed the direct effect of breastfeeding knowledge, family support, and attitude toward breastfeeding on intention to exclusively breastfeed. The modified model test results showed that breastfeeding knowledge and attitude toward breastfeeding affected the intention to exclusive breastfeeding directly and positively (β = .42; β = .22, all p < .001, respectively). The path analysis in the hypothesized model test result revealed that family support did not predict intention to exclusive breastfeeding (β = .09, p > .05, respectively). Therefore, the third research hypothesis was partially supported.

2.3.1 Effect of breastfeeding knowledge on intention to exclusive breastfeeding

According to Ajzen (1991), knowledge is the antecedent of behavior predictors. Knowledge is the foundation of beliefs which thus formulate individual intention and actual behavior (Ajzen et al., 2011). This study selected breastfeeding knowledge as a predictor of intention to exclusive breastfeeding based on the results of previous studies. Evidence showed that knowledge influenced intention to breastfeed directly (Herndon, 2014; Mitra et al., 2004; Ratananugool, 2001). That study result was not surprising. The modified model showed that breastfeeding knowledge affected intention to exclusive breastfeeding directly and positively (β = .42, p < .001). Breastfeeding knowledge was the strongest predictor of intention to breastfeed (β = .42, p < .001) among working Muslim mothers in Central Java Province, Indonesia. Greater knowledge produced a greater intention to exclusively breastfeed. The study finding was consistent with the previous study findings in Mississippi, Thailand, and North Carolina. A study in Mississippi found that breastfeeding knowledge influenced

intention to breastfeed (Mitra et al., 2004). Greater breastfeeding knowledge caused a stronger intention to breastfeed among low income mothers ($\beta = .39$, $p < .05$) (Mitra et al., 2004). In another supporting study, breastfeeding knowledge was significantly correlated with intention to breastfeed among Thai mothers ($r = .17$, $p < .05$) (Ratananugool, 2001). A study by Herndon (2014) showed that breastfeeding knowledge had a significant correlation with intention to breastfeed ($r = .41$, $p < .001$) among rural, low-income Native Americans and African American adolescent mothers in North Carolina.

2.3.2 Effect of family support on intention to exclusively breastfeed

The influence of family support on the intention to exclusive breastfeeding is well known. Evidence showed that family support significantly affected the intention to exclusive breastfeeding (Al-Akour, et al., 2002; Humpreys et al., 2002). The hypothesized model test result revealed that family support did not affect intention to exclusive breastfeeding ($\beta = .09$, $p > .05$). This study result was somewhat surprising. Several possible reasons are the assumed correlation with the findings of this study. One of the possible explanations is that the population in this study was composed of working mothers. They might have extensive social interaction and access to breastfeeding information sources. They also had the ability to find information sources regarding exclusive breastfeeding on their own. They had more independence and confidence to determine the choice for infant feeding. In addition, the majority of mothers in this study had a bachelor degree. The high level of education also contributed to the mothers' way of thinking and decision making for a healthier life style.

Furthermore, the mothers in this study had a higher income compared to the general population of mothers. According to Crimmel (2004), family income level affected the type of health insurance selected. A family with a higher income selected better health insurance for their family members (Crimmel, 2004). Mothers in this study probably had good health insurance and selected a good hospital for antenatal care and to give birth. Thus, they might receive a good antenatal class during pregnancy at a hospital. Most of the mothers had a nuclear family and stayed far away from their other family members because they stayed in the city and their families stayed in the village. So, interaction between the mothers and their families was just a little. The reasons above probably explain the possibility that family support did not correlate with the intention to exclusively breastfeed. As a result, working mothers had the intention to exclusive breastfeeding without influence from their family members. Since the influence of family support on the intention to exclusive breastfeeding was not significant among working mothers, the path between family support and intention to exclusive breastfeeding was dropped in the modified model.

2.3.3 Effect of attitude toward breastfeeding on intention to exclusive breastfeeding

Theoretically, attitude toward behavior forms individual intention to perform a specific behavior (Ajzen, 1991). In the TPB, attitude toward behavior is one of the predictors of intention (Ajzen, 1991). As a general rule, positive attitudes produce a greater intention to perform a behavior. In this study, the premise in the Theory of Planned Behavior was supported. The modified model showed that the attitude toward breastfeeding affected intention to exclusive breastfeeding directly and positively

(β = .22, p < .001). The study finding was consistent with evidence from Bangladesh, America, Thailand, and Hong Kong. A cross sectional study among Muslim mothers in Bangladesh revealed that attitude could predict intention to exclusive breastfeeding (β = .52, p < .05) (S. Khatun, 2010). A study among American mothers found that attitude toward breastfeeding (β = .36, p < .05) was a significant predictor of intention to breastfeed (Bai et al., 2010). Ratananugool (2001) conducted a longitudinal study in Thai adolescent mothers. She examined the mothers' intention to breastfeed and breastfeeding practice at four weeks and three months postpartum. The study revealed that the Thai adolescent mothers' intention to breastfeed can be predicted by attitude toward breastfeeding (β = .17, p < .05) (Ratananugool, 2001). In addition, attitude toward breastfeeding had a positive effect on breastfeeding duration through the intention among Hong Kong mothers (Dodgson et al., 2003).

The predictive ability of attitude toward breastfeeding on intention to EBF was inconsistent. A study showed that intention to breastfeed among low income mothers in the United States could not be predicted by attitude toward breastfeeding (G. J. Hill et al., 2008). In this population, intention to breastfeed was predicted by other factors. A possible rationale is the study by G. J. Hill et al. (2008) was conducted in a developed country, whereas this study was conducted in a developing country. Another possible reason is the mother's religion. All of the mothers in this study were Muslim. Religious beliefs shape individual beliefs regarding a behavior. Islam regulates all of a Muslim's daily life. Islam encourages Muslim mothers to breastfeed their infants up to two years old. A mother who refuses to breastfeed will accept God's punishment and a mother who breastfeeds will accept God's reward. It makes Muslim mothers try to breastfeed their infants.

2.4 Direct effect of breastfeeding knowledge, family support, workplace support, attitude toward breastfeeding, sufficient milk supply, breastfeeding initiation, and intention to exclusive breastfeeding on breastfeeding duration

The fourth hypothesis was the direct effects of breastfeeding knowledge, family support, workplace support, attitude toward breastfeeding, sufficient milk supply, breastfeeding initiation, and intention to exclusive breastfeeding on breastfeeding duration. The modified model showed that breastfeeding knowledge, family support, workplace support, attitude toward breastfeeding, sufficient milk supply, and intention to exclusive breastfeeding affected directly and positively on breastfeeding duration (β = .26, p < .001; β = .13, p < .001; β = .07, p < .05; β = 0.49, p < .001; β = .11, p < .001; β = .23, p < .001, respectively).

2.4.1 Effect of breastfeeding knowledge on breastfeeding duration

In the TPB, knowledge is one of the antecedents of the behavior predictors and has no direct path to intention and behavior (Ajzen, 1991). This study tested the ability of breastfeeding knowledge to predict breastfeeding duration directly based on evidence. The results of several previous studies found that knowledge affected individual behavior directly and significantly (Chezem et al., 2006; Ratananugool, 2001; Wicitra, 2009).

The results of this study revealed that breastfeeding knowledge predicted breastfeeding duration directly and significantly. It was not surprising. The path analysis result showed that breastfeeding knowledge affected directly and positively on breastfeeding duration (β = .26, p < .001). Greater breastfeeding knowledge created longer breastfeeding duration among working Muslim mothers in Central Java Province, Indonesia.

The findings of this study were congruent with the findings of previous studies. Breastfeeding knowledge affected longer breastfeeding duration among Indonesian, American, and Thai mothers. A study among Indonesian mothers was conducted by Wicitra (2009). The study showed that greater breastfeeding knowledge significantly predicted breastfeeding duration among working Indonesian mothers. Breastfeeding knowledge also had a significant correlation with breastfeeding duration among American mothers (Chezem et al., 2006). Furthermore, breastfeeding knowledge was a significant predictor of breastfeeding at four weeks after delivery among Thai mothers (Ratananugool, 2001).

The significant association between breastfeeding knowledge and breastfeeding duration may be due to a mother's education level. The majority of mothers in this study had a bachelor degree. A higher level of education caused better adherence to a healthy behavior (Baum & Payea, 2004). In addition, a literature review in the United States revealed that the educational level contributed to a healthy behavior preference (Cutler & Lireas-Munrey, 2010). A higher educated person performed healthier behavior and it was affected by income, health insurance, family background, knowledge, cognitive ability, and social networks (Cutler & Lireas-Munrey, 2010).

2.4.2 Effect of family support on breastfeeding duration

It is well known that support affects breastfeeding duration positively (Shahla, Fahy, & Kable, 2010). Evidence showed that family support plays a significant role on breastfeeding duration. A higher level of family support produced a longer breastfeeding duration among Asian (Biswas, 2010; Ratananugool, 2001) and Western mothers (Dennis, 2006). Mothers who received support from their family members breastfed longer than mothers who did not receive breastfeeding support

(Biswas, 2010; Dennis, 2006; Ratananugool, 2001). This study examined the ability of family support to predict breastfeeding duration directly.

The findings of this study showed that family support significantly predicted breastfeeding duration. The path analysis result of the modified model showed that family support directly and positively affected breastfeeding duration (β = .13, $p < .001$). It was not surprising. This study was consistent with four previous study results in Thailand, Bangladesh, and Indonesia. Family support had a significant correlation with breastfeeding duration among Thai mothers (r = .56, $p < .05$) (Ratananugool, 2001). A high correlation value between family support and breastfeeding duration was found in Bangladesh. A study among postpartum Bangladeshi mothers revealed that family support correlated significantly with exclusive breastfeeding duration (r = .90, $p < .01$) (Biswas, 2010). Family support correlated significantly with breastfeeding duration in Central Java Province, Indonesia (Anggorowati & Nuzulia, 2013) and in Makassar city, Indonesia (Rahmawati, Bahar, & Salam, 2013). The results of this study supported the family support concept.

Although the family pattern of most mothers in this study was a nuclear family, the significant effect of family support on breastfeeding duration in this study might be due to a close relationship among family members among Javanese. In Javanese culture, family members have a very strong bonding with each other. Family members love, help, share, give, and protect each other (Wiranta, 2013). Parents in Javanese culture take care of their children not only until they grown up but also until their grandchildren grow up (Wiranta, 2013). Just after the birth of a baby, the family members gather to help a new mother, celebrate the baby's birth, do the household tasks, and prepare a ritual to welcome the baby. During the postpartum period, many

family members visit and congratulate the parents on the birth of the baby. They also share the childcare and breastfeeding experience. New mothers also get information regarding motherhood. Family members, mostly women, help a mother take care of the infant while the mother goes outside the home that includes working (Rejeki, 2009). Family members of working mothers are involved in providing the expressed breast milk to the infant during working hours (Rejeki, 2009). Therefore, family support had a significant effect on breastfeeding duration among working Javanese mothers (Rejeki, 2009).

2.4.3 Effect of workplace support on breastfeeding duration

During the lactating period, a working mother has special needs to maintain the breast milk supply. Examples of workplace support are the availability of a designated room to express the breast milk, a refrigerator to keep the expressed breast milk, break time, maternity leave, encouragement from supervisors or colleagues, flexible work hours, and policies that support breastfeeding in the workplace (Hirani & Karmaliani, 2012). Evidence showed that workplace support increased breastfeeding duration among lactating working mothers (Mensah, 2011; Ortiz et al., 2004). Workplace support significantly influenced overall breastfeeding and EBF duration among working mothers (R. M. Amin et al., 2011; Whaley et al., 2002).

The findings of this study support the empirical evidence. The modified model showed that workplace support affected directly and positively on breastfeeding duration ($\beta = .07$, $p < .05$). This study result was congruent with previous study results in Malaysia and the United States. Malaysian mothers experienced short breastfeeding duration due to lack of breastfeeding support in the workplace. Working Malaysian mothers who did not have appropriate workplace support were 1.8 times more likely to

have a shorter duration of breastfeeding compared with working mothers who received workplace support (*OR* = 1.80, 95%*CI* = 1.05 – 3.10) (R. M. Amin et al., 2011). Workplace support significantly affected breastfeeding duration among female employees in the United States ($p < .05$) (Whaley et al., 2002).

Workplace support plays a significant role in breastfeeding duration among working mothers in Indonesia (Lestari, Trisyani, & Widiasih, 2012). No doubt, lactating working mothers who received sufficient workplace support breastfed longer than mothers who did not receive workplace support (Whaley et al., 2002). The availability of equipment needed for pumping the breast milk, sufficient maternity leave, flexible working hours, break time, encouragement from colleagues, and breastfeeding policies in the workplace support working mothers to maintain the breast milk supply (Aisyah, 2009; Setyawati & Sutrisminah, 2012). Pumping the breast milk during working hours may sustain the breast milk supply, thus the mother can breastfeed exclusively up to six months after delivery.

2.4.4 Effect of attitude toward breastfeeding on breastfeeding duration

In the TPB, attitude toward behavior does not have a direct path to behavior but it affects behavior indirectly through intention (Ajzen, 1991). According to Ajzen (1991), a more positive individual attitude toward a behavior produces a greater intention to perform a behavior. Consequently, the individual had a higher possibility to perform the behavior. Previous studies showed that attitude toward breastfeeding affected breastfeeding duration directly, positively, and significantly (Cernadas, Noceda, Barera, Martinez, & Garsd, 2003; Nasution, 2013).

This study provides new evidence because this study found that attitude toward breastfeeding predicted breastfeeding duration directly and positively. As expected, the modified model showed that attitude toward breastfeeding affected directly and

positively on breastfeeding duration (β = .49, p < .001). This study result was congruent with the previous study results. Exclusive breastfeeding duration was significantly affected by attitude toward breastfeeding (Cernadas et al., 2003). Another study in Indonesia also revealed that attitude toward breastfeeding significantly predicted exclusive breastfeeding duration (Nasution, 2013).

In this study, attitude toward breastfeeding included four items regarding Muslim beliefs toward the commands of Allah to breastfeed the infant up to two years of age and Allah will give rewards to mothers who breastfeed their child. Those four items were item number 24 “Mother who breastfeed her infant will get the God’s rewards”, item number 25 “Islam encourages mother to breastfeed up to 2 years”, item number 49 “Mother who breastfeed her infant will get the God’s rewards is very important for me”, and item number 50 “Islam encourages mother to breastfeed up to 2 years is very important for me”. The study finding showed that attitude toward breastfeeding was the most powerful predictor of breastfeeding among the subjects of this study (β = .49, p < .001). It might be because the religion of all subjects was Muslim and they have similar beliefs regarding breastfeeding in Islam. Muslim women are encouraged to breastfeed their infants. Consequently, they try to obey the commands of Allah to get the rewards and to avoid the punishments.

2.4.5 Effect of sufficient milk supply on breastfeeding duration

Sufficient milk supply is defined as mother perceived that her breast milk only is adequate to meet her infant’s necessity. Sufficient milk supply is an important factor of long breastfeeding duration because insufficient milk supply is the major reason of non-exclusive breastfeeding and short breastfeeding duration. Insufficient milk supply is defined as maternal perception that her breast milk is not enough to fulfill her infant’s need. Insufficient milk supply is well-known as a major

predictor of a non-exclusive breastfeeding practice in both developed (Hill & Aldag, 1991; Ruowei et al., 2008) and developing countries (Afiyanti & Juliastuti, 2012). This study examined the ability of sufficient milk supply to predict breastfeeding duration. Sufficient milk supply was measured using the nine-item H & H Lactation Scale. This instrument provides information regarding the perception of a lactating mother toward the adequacy of her milk supply. A higher score of the nine-item H & H Lactation Scale indicates a greater maternal perception regarding the adequacy of her breast milk supply. Conversely, a lower score of the nine-item H & H Lactation Scale indicates a lower maternal perception regarding the adequacy of her breast milk supply.

The results of this study support the empirical evidence. The path analysis result of the modified model revealed that sufficient milk supply affected breastfeeding duration ($\beta = .11$, $p < .01$). This study finding was not surprising. It is well-known that sufficient milk supply significantly results in long breastfeeding duration. In contrast, insufficient milk supply produces a short breastfeeding duration that leads the mother to provide supplementary food for an infant younger than six months of age.

This study finding was consistent with the previous study results from Turkey, Nigeria, Bangladesh, Ghana, and the United States. The study in Turkey found that perceived insufficient milk supply was the strongest predictor of non-exclusive breastfeeding practice among Turkish mothers (Khassawneh et al., 2006). A low breast milk supply perception caused Nigerian mothers to provide supplementary food for their baby before six months of age (Davies-Adetugbo, 1997). Another study among Bangladeshi mothers found that the major cause of giving supplementary food

to infants below six months of age was the perception of insufficient breast milk supply (62.3 percent) (Gatrell, 2007).

Furthermore, a study in Ghana (Otoo et al., 2009) revealed that insufficient milk supply was the most common problem during a breastfeeding period which led mothers to provide supplementary food besides the breast milk for their infants. In addition, Hill and Humenick (1996) also found a significant correlation between the total score of the H & H Lactation Scale, and the three-subscales and 12 weeks of breastfeeding status (r = .62, .66, .48, and .53, all $p < .05$, respectively). Other studies also found that the perception of having a low breast milk supply significantly predicted artificial milk feeding among term (*OR* = 10.4, 95%*CI* = 3.0 – 37.6) (Hill & Humenick, 2007) and preterm infants (*OR* = 11.16, 95%*CI* = 3.18 – 39.22) (Hill & Humenick, 2007).

The perception of a lack of breast milk supply influences early breast milk supplementation and affects exclusive breastfeeding duration. Breast milk production may be a small amount during the first three days after delivery (Pilliteri, 2012). The mother and her family members may perceive that the breast milk production is not enough to feed the infant. In Javanese culture, an infant is given sweet water, honey, sweet food, rice porridge, and other kinds of soft food for a few days after birth (Rejeki, 2009). This cultural belief may impede the exclusive breastfeeding practice. Conversely, a mother who is confident with her breast milk supply can exclusively breastfeed her infant up to six months after delivery. Information regarding the infant's nutritional needs and the signs of inadequate nutrition are important to be provided to the mother. It may prevent the mother from the perception of an insufficient milk supply.

2.4.6 Effect of intention to exclusive breastfeeding on breastfeeding duration

Intention to exclusive breastfeeding was an essential component of breastfeeding duration. This finding supports the Theory of Planned Behavior which proposed that intention is the central factor of a behavior (Ajzen, 1991). According to Ajzen (1991), intention leads an individual to perform a specific behavior. Several previous studies revealed that intention to exclusive breastfeeding correlated with breastfeeding duration. Evidence showed that a greater intention by the mother to breastfeed produced a longer duration of breastfeeding practice (J. A. Scott et al., 2001; J.A. Scott et al., 1999; Ratananugool, 2001).

The results of this study support the findings of previous studies. The modified model showed that an intention to exclusive directly and positively on breastfeeding duration (β = .22, p < .001). A greater intention led to longer breastfeeding duration. This finding in the study supported the TPB and it was not surprising. This study finding was consistent with the previous study findings from Thailand, Hong Kong, and the United States. A study among Thai mothers (Ratananugool, 2001) revealed that intention to breastfeed was the best predictor of breastfeeding duration (β = .74, p < .01). In addition, a study in Hong Kong found that intention to EBF significantly correlated with actual duration of EBF (r = .67, p < .01) (Dodgson et al., 2004). Furthermore, a study in the United States (Whaley et al., 2002) revealed that intention to exclusive breastfeeding was a significant predictor of breastfeeding duration.

Human behavior is goal oriented and controlled by willingness (Ajzen, 1985). An individual who intends to accomplish a behavior has a greater possibility of success in performing the behavior (Orbeil, Hodgldns, & Sheeran, 1997). The Theory of Planned Behavior is used widely in health sciences and evidence showed that intention

was the main predictor of a health behavior (Ajzen, 1991). The integration of intention into an intervention study provided evidence that individual intention to carry out a behavior enhances the actual behavior implementation and diminishes the proficiency of the past behavior effect to the imminent behavior (Orbeil et al., 1997). The results of this study support the TPB and provide evidence regarding the ability of intention to exclusive breastfeeding to predict breastfeeding duration directly and positively.

2.5 Direct effect of breastfeeding problems and breastfeeding initiation on breastfeeding duration

The fifth hypothesis proposed that breastfeeding problems and breastfeeding initiation have direct effects on breastfeeding duration. The modified model showed that breastfeeding problems affected breastfeeding duration directly and negatively (β = -.11, p < .01) and breastfeeding initiation did not affect breastfeeding duration directly (β = -.06, p > .05). Therefore, the fifth research hypothesis was partially supported.

2.5.1 Effect of breastfeeding problems on breastfeeding duration

Breastfeeding problems may occur during the breastfeeding period and interfere with breastfeeding duration (Wambach, 1997). Breastfeeding problems significantly affected exclusive breastfeeding duration (Taveras et al., 2004). More breastfeeding problems created shorter breastfeeding durations (J. A. Scott et al., 2006; Ratananugool, 2001, Wojcicki et al., 2010).

The results of this study support the previous empirical evidence. The modified model showed that breastfeeding problems affected breastfeeding duration directly and negatively (β = -.11, p < .01). This study finding was consistent with the results of previous studies. In Thai mothers, breastfeeding problems were the predictor of breastfeeding duration at four weeks and three months after delivery

(Ratananugool, 2001). Mothers who did not have breastfeeding problems breastfed 1.75 times longer compared to mothers who had breastfeeding problems (*OR* = 1.75, 95%*CI* = 1.35 –2.23) (J. A. Scott et al., 2006). Furthermore, the study revealed that feeling pain and being uncomfortable during breastfeeding were predictors of a short EBF duration (*OR* = 1.41, 95%*CI* = 1.06 – 1.89) (Wojcicki et al., 2010).

Experiencing breastfeeding problems during the lactating period may affect exclusive breastfeeding duration. Feeling pain during breastfeeding, breast engorgement, breast milk leak onto clothes while working, tiredness and sleepiness while working, sore nipples, and other problems influenced the duration of breastfeeding among working mothers (Rejeki, 2009). Some mothers preferred to combine breast milk and formula milk so her husband or other family members could help feed the infant at night. Preventing breastfeeding problems is the best way to manage the situation before problems occur. A breastfeeding problem prevention program may be included in the lactation management program and delivered during antenatal visits.

2.5.2 Effect of breastfeeding initiation on breastfeeding duration

Breastfeeding initiation has several benefits for both mother and infant. Breastfeeding initiation is implemented within the first hour after delivery (WHO, 2012). Evidence showed that breastfeeding initiation affected exclusive breastfeeding duration (Clements et al., 1999; DiFrisco et al., 2011; Kumar et al., 2006; Nakao et al., 2008; Sumini, 2011). This study examined the ability of breastfeeding initiation to predict breastfeeding duration.

The results of this study did not support the previous studies results. The path analysis showed that breastfeeding initiation did not have a significant effect on the length of breastfeeding duration directly (β = -.06, p > .05). Previous study results

from Egypt, Japan, the United States, and Indonesia were not consistent with the finding of this study. A study in Egypt (Clements et al., 1999) found that breastfeeding initiation affected EBF duration. Mothers who initiated breastfeeding quickly were more likely to breastfeed exclusively longer compared to mothers who did not initiate breastfeeding at the same time. A study in Japan found that Japanese mothers who initiated early breastfeeding breastfed 2.5 times longer compared to mothers who initiated breastfeeding later (*OR* = 2.50, 95%*CI* = 1.21-.95) (Nakao et al., 2008). Another study (DiFrisco et al., 2011) found that early breastfeeding initiation among American mothers increased EBF duration by 8.05 times (χ^2= 8.05, $p < .01$). Breastfeeding initiation within one hour after delivery correlated significantly with exclusive breastfeeding duration among Indonesian mothers ($r = .72$, $p < .01$) (Sumini, 2011).

The possible reason of inability of breastfeeding initiation to predict breastfeeding duration ($\beta = -0.06$, $p > .05$) might be due to several possible reasons. The Indonesian Ministry of Health issued a law No.450/MENKES/SK/VI/ 2004 related to breastfeeding initiation. As stated in the law, the Indonesian Ministry of Health suggests all of health care providers to facilitate breastfeeding initiation within the first hour after delivery both among normal or cesarean section delivery. In addition, the Indonesian ministry of Health also provides breastfeeding initiation training for health care providers who work in delivery room. The Indonesian Ministry of Health also issued a law related to Baby Friendly Hospital policy which mentioned in the Law No.603/2008. A hospital which has a baby friendly hospital policy has to facilitate breastfeeding initiation within the first hour after delivery as a routine care**.**

In this study, the majority of mothers gave birth in a hospital, however the breastfeeding initiation among mothers in this study was low (35.4%). It might be assumed that the hospital do not follow the breastfeeding initiation regulation. Breastfeeding initiation did not perform within the first hour after delivery. Other related causes may be health care providers provide formula to infants, post caesarean mothers have to stay separately with her infant, infant was cleaned up just after birth, and do not follow rooming in regulation (Fikawati & Syafiq, 2011).

2.6 Mediating effect of breastfeeding initiation on the relationships among breastfeeding knowledge, attitude toward breastfeeding, and intention to exclusive breastfeeding on breastfeeding duration

The sixth hypothesis evaluated the mediating effect of breastfeeding initiation on the relationships between breastfeeding knowledge and breastfeeding duration, family support and breastfeeding duration, and intention to exclusively breastfeed, and breastfeeding duration. The path analysis results showed that breastfeeding knowledge, family support, and intention to exclusive breastfeeding did not have significant indirect and positive effects on breastfeeding duration through breastfeeding initiation (β = -.01, p > .05; β = 0.00, p > .05; β = .01, p > .05, respectively). Therefore, the sixth research hypothesis was not supported.

Breastfeeding initiation was suggested by WHO (2012) to be performed within one hour after delivery. The mediating effect of breastfeeding knowledge, family support, and intention to exclusive breastfeeding was novel. There is no previous study that examined this path. This study selected breastfeeding knowledge, attitude toward breastfeeding, and intention to exclusive breastfeeding as the predictors of breastfeeding duration mediated by breastfeeding initiation based on the literature review. Evidence showed that breastfeeding knowledge (Gijsbers et al., 2006; Hidayat &

Dewantiningrum, 2012; Nastiti, 2013), family support (Biswas, 2010; L. Li et al., 2004; J. A. Scott & Binns, 1999), and intention to exclusive breastfeeding (Donath & Amir, 2003; Herndon, 2014) directly predicted breastfeeding initiation. In addition, breastfeeding initiation directly predicted breastfeeding duration (Clements et al., 1999; DiFrisco et al., 2011; Kumar et al., 2006; Nakao et al., 2008; Sumini, 2011).

The results of this study partially supported the sixth research hypothesis. The path analysis results showed that breastfeeding knowledge, family support, and intention to exclusive breastfeeding did not have indirect effects on breastfeeding duration through breastfeeding initiation. The rationale of the inability of breastfeeding initiation to mediate breastfeeding knowledge, family support, and intention to exclusive breastfeeding on breastfeeding duration may be due to several factors. Firstly, the subjects in the population of this study were working mothers. Although the working mothers initiated breastfeeding early after delivery, they may have experienced some breastfeeding problems affecting breastfeeding during the six months after delivery (Chen, Wu, & Chie, 2006). Working mothers have more breastfeeding obstacles compared to general mothers in performing exclusive breastfeeding. The obstacles may be physical, psychological, or social such as difficulty getting a break time during working hours, the breast milk pumping room is located far from the working site, unsupported working environment, negative appreciation from working colleagues, lack of supervisor support (Chen et al., 2006), no breast milk pumping room and other supporting facilities in the workplace, breast and nipple problems, perceived insufficiency milk supply, lack of family support, and drug effects while breastfeeding (Okwy-nweke, Anyanwu, & Maduforo, 2014).

Secondly, providing supplementary food for infants younger than six months of age is common in Javanese culture. Exclusive breastfeeding may be unsuccessful because the infant is provided supplementary food or water by the person who takes care of the infant when the mother is working (Rejeki, 2009). Thirdly, some mothers who gave birth via a caesarean section postponed breastfeeding initiation due to the effects of intra-operative anesthesia and an uncomfortable environment in the operating room (Zanardo, Svegliado, Cavallin, Giustardi, Cosmi, Litta, & Trevisanuto, 2010). A post-caesarean section mother may have a strong intention to breastfeed exclusively and breastfeed exclusively up to six months of the infant's age; however, she cannot initiate the breastfeeding within one hour after delivery (Kuyper, Vitta, & Dewey, 2014).

These study findings were innovative, because there are no previous studies that test the mediating effect of breastfeeding initiation on the relationships among breastfeeding knowledge, attitude toward breastfeeding, and intention to exclusive breastfeeding to breastfeeding duration. It is highly recommended to test the model across groups such as general mothers and adolescent mothers.

2.7 Mediating effect of intention to exclusive breastfeeding on the relationships among breastfeeding knowledge and attitude toward breastfeeding on breastfeeding initiation

The seventh hypothesis was intention to exclusive breastfeeding mediates the relationships among breastfeeding knowledge and attitude toward breastfeeding to breastfeeding initiation. Testing the mediating effect of intention to exclusive breastfeeding on the relationship among breastfeeding knowledge and attitude toward breastfeeding to breastfeeding initiation was innovative in this study. The selection of intention to exclusive breastfeeding as the mediator on the relationships among breastfeeding knowledge and attitude toward breastfeeding to breastfeeding initiation

was based on previous study results. Intention to exclusive breastfeeding was the greatest predictive factor of breastfeeding initiation among mothers in the United Kingdom (Donath & Amir, 2003). In addition, breastfeeding knowledge (Mitra et al., 2004) and attitude toward breastfeeding (Dodgson et al., 2003; Duckett et al., 1998; Trzcinski & Holst, 2007) affected maternal intention to breastfeed. Therefore, this study hypothesized that intention to breastfeed mediates breastfeeding knowledge and attitude toward breastfeeding to breastfeeding initiation.

The path analysis results of the modified model showed that breastfeeding knowledge and attitude toward breastfeeding affected breastfeeding initiation indirectly and negatively through intention to exclusive breastfeeding (β = -.09, $p < .01$; β = -.05, $p < .01$, respectively). The study findings were not surprising. As a general rule, greater breastfeeding knowledge and a better attitude toward breastfeeding create a higher intention to exclusive breastfeeding and faster breastfeeding initiation. The results of this study were congruent with previous study findings. A study that recruited a large sample in the United Kingdom found that maternal intention to breastfeed was the strongest predictor of breastfeeding initiation (OR = .91, $p < .05$) (Donath & Amir, 2003). Intention mediated the effect of attitude toward breastfeeding to breastfeeding duration (Dodgson et al, 2003; Duckett et al., 1998). There are no previous studies that examined the mediating effect of intention to exclusive breastfeeding on the relationships of breastfeeding knowledge and breastfeeding duration; so, it was novel.

This study provides evidence regarding the power of intention to force an individual to accomplish a behavior. The ability of intention to mediate breastfeeding knowledge and attitude toward behavior support the TPB. According to Ajzen (1991), intention to perform a behavior is the main focus of a behavior and mediates the relationships between the predictors and the behavior. In this study, mothers had a

high mean score of breastfeeding knowledge and attitude toward breastfeeding. A higher score of breastfeeding knowledge and attitude toward breastfeeding reflected more breastfeeding knowledge (Ismail & Sulaiman, 2010) and a greater positive attitude toward breastfeeding (S. Khatun, 2010). Thus, greater breastfeeding knowledge and attitude toward breastfeeding caused a greater intention to exclusive breastfeeding among mothers (Wang, Lau, Chow, & Chan, 2014). Afterwards, the greater intention to exclusive breastfeeding significantly affected longer breastfeeding duration (Donath & Amir, 2003).

Another reason is it might be due to the higher education level of mothers in this study compared to mothers in the general population in Indonesia. The maternal and paternal education levels affected breastfeeding initiation (Heck, Braveman, Cubbin, Chavez, & Kiely, 2006). A higher education level influenced the ability to get proper information regarding breastfeeding, positive beliefs regarding breastfeeding, and a higher intention to exclusively breastfeed. In addition, the majority of mothers in this study delivered normally. Mothers who gave birth normally were more likely to initiate breastfeeding earlier compared to mothers who gave birth via a caesarian section (Zanardo, Svegliado, Cavallin, Giustardi, Cosmi, Litta, & Trevisanuto, 2010).

2.8 Mediating effect of intention to exclusive breastfeeding on the relationships among breastfeeding knowledge and attitude toward breastfeeding on breastfeeding duration

The eighth hypothesis mentioned that intention to exclusive breastfeeding mediates the relationships between breastfeeding knowledge and attitude toward breastfeeding with breastfeeding duration. The ability of intention to mediate attitude toward behavior is well recognized. Ajzen (1991) supposed in the Theory of Planned Behavior that intention is the mediator between a behavior and the intention predictive

factors. Attitude toward behavior is one of the intention predictive factors (Ajzen, 1991). In addition, the ability of intention to mediate the knowledge to a behavior in this study was novel. This study examined the mediating effect of intention to exclusive breastfeeding on the relationships between breastfeeding knowledge and attitude toward breastfeeding to breastfeeding duration.

The path analysis results of the modified model showed that breastfeeding knowledge and attitude toward breastfeeding significantly affected breastfeeding duration indirectly and positively through intention to exclusive breastfeeding (β = .10, $p < .001$; β = .05, $p < .01$, respectively). The results of this study were congruent with previous study findings. Intention significantly mediated the effect of breastfeeding knowledge on breastfeeding duration. Three previous studies examined the causal models of breastfeeding duration among mothers in the United States (Duckett et al., 1998; Wambach, 1998) and Hong Kong (Dodgson et al., 2003). All of these studies evaluated the TPB in the area of breastfeeding. The findings of this study were consistent with the studies of Duckett et al. (1998) and Wambah (1997). Attitude toward breastfeeding significantly affected breastfeeding duration indirectly and positively through intention to breastfeed (Duckett et al., 1998; Wambah, 1997).

The findings of this study were not congruent with the study of Duckett et al. (1998). Duckett et al. (1998) examined the indirect effect of breastfeeding knowledge on breastfeeding duration via intention to exclusively breastfeed. The result showed that breastfeeding knowledge influenced breastfeeding duration directly. No previous study found the mediating effect of breastfeeding knowledge on breastfeeding duration. So, the finding in this study was novel. A study by Mitra et al. (2004) showed that breastfeeding knowledge affected intention to exclusively breastfeed. Afterwards, a randomized control trial study among Australian women was conducted

by Forster, McLachlan, and Lumley (2006). The study found a significant correlation between intention to breastfeed and actual breastfeeding duration across groups and personal characteristics. It might be assumed that breastfeeding knowledge affected breastfeeding duration through intention to breastfeed.

It is well-known that intention is the central factor of a human behavior (Ajzen, 1991). Knowledge and attitude toward behavior influence individual intention to perform a behavior (Ajzen, 1985). It may be supposed that greater knowledge and a greater positive attitude make a greater intention to perform a behavior. Afterward, the greater intention creates a greater possibility to perform a behavior. In this study, greater breastfeeding knowledge may be because the education level in the majority of mothers was a bachelor degree. Higher education of an individual brings better opportunities to access breastfeeding information sources, learn various cultural and social differences, and live a healthier life style (Cutler & Llereas-Muney, 2010). It may be assumed that an individual with a high educational level has better knowledge regarding breastfeeding. In addition, all of the mothers in this study were Muslim. Religious beliefs form the individual beliefs regarding a behavior (Lindeman & McAthie, 1999). Islam encourages Muslim mothers to breastfeed and it may affect the Muslim mothers' attitude toward breastfeeding. It is highly recommended to replicate the mediating effect of intention to exclusive breastfeeding on the relationships among breastfeeding knowledge and attitude toward breastfeeding to breastfeeding initiation in a future study among a different population to support the theoretical framework.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the conclusions of the study findings, implications of the study results into nursing science, the strengths and limitations of this study, and recommendations for nursing and future research.

Conclusions of the Study Findings

This study aimed to develop and examine causal relationships of breastfeeding duration predicting factors among working Muslim mothers in Central Java Province, Indonesia. The hypothesized model was depicted based on the theory, empirical evidence, and consideration of Muslim beliefs. The Theory of Planned Behavior and six other concepts were used to guide the researcher to develop the hypothesized model. There were eight independent variables and one dependent variable. The independent variables were breastfeeding knowledge, family support, workplace support, attitude toward breastfeeding, breastfeeding problems, sufficient milk supply, breastfeeding initiation, and intention to exclusive breastfeeding. The dependent variable was breastfeeding duration.

This study recruited 240 lactating working mothers in six primary health centers which are situated in Semarang, Central Java Province, Indonesia. This study used 10 research instruments to collect the data. They were the Personal Characteristic Questionnaire, Modified Malay-version of Breastfeeding Knowledge Questionnaire, Modified Family Support Questionnaire, Modified Workplace Breastfeeding Support Scale, Modified Breastfeeding Attitude Questionnaire, Breastfeeding Experience Scale, nine-item H & H Lactation Scale, Intention to Exclusive Breastfeeding Scale, Breastfeeding Initiation Scale, and Breastfeeding Duration Scale.

The research instruments in this study were validated by six experts in Indonesia and Thailand for the appropriateness of the concept and cultural sensitivity. The results of validity tests in this study showed that the research instruments had both adequate concept and culture sensitivity with a minor revision based on an expert's recommendation. A panel of experts evaluated the suitability of the questionnaires to the related construct, the clinical and cultural appropriateness, and language relevance with Indonesian context. For the content validity index (CVI), the experts were asked to rate each item of the instruments on a 4-point scale with 1 indicating not relevant and 4 indicating very relevant. The proportion of ratings 3 and 4 of the Modified Malay-version of Breastfeeding Knowledge Questionnaire, Modified Family Support Questionnaire, Modified Workplace Breastfeeding Support Scale, Modified Breastfeeding Attitude Questionnaire, Breastfeeding Initiation Scale, and Breastfeeding Duration Scale were .96, .95, .85, .95, 1, and 1, respectively. Since all instruments were established in English, all of them were translated from English into the Indonesian language using a back translation technique.

The research instrument reliabilities in this study were examined using the Kuder-Richardson 20, Cronbach's Alpha, and test-retest techniques. The results of the Kuder-Richardson 20 test revealed that the internal consistency of the Modified Malay-version of Breastfeeding Knowledge Questionnaire was .82. The Cronbach's Alpha coefficients of the Modified-Family Support Questionnaire, Modified Workplace Breastfeeding Support Scale, Modified Breastfeeding Attitude Questionnaire, nine-item H & H Scale, and Breastfeeding Experience Scale were .94, .87, .95, .89, and .85, respectively. In addition, the Pearson Correlation and Intraclass Correlation test results showed that the test-retest reliabilities of the Breastfeeding Initiation Scale, Intention to

Exclusive Breastfeeding Scale, and the Breastfeeding Duration Scale were .99, 1, and .99, respectively. The results of the reliability tests revealed that all of the research instruments in this study were in an acceptable reliable range.

The hypothesized model was tested using a computer program. Some of the statistic test results met the goodness of fit criteria; however, some of them did not meet the criteria. The Chi-square test was 25.80 (p = .000), relative chi-square (3.69) was more than 3, NFI (.97) was more than .95, NNFI was .87, GFI (.97) was more than .90, AGFI (.84) was less than .90, CFI (.97) was more than .95, RMSEA (.07; .15) partially met the criteria (<.08 & <.10), and SRMR (.06) was less than .08 or .05. Thus, further interpretation of the results was not performed.

Based on the modification indices and empirical evidence consideration, the researcher modified the hypothesized model. The path which had the lowest path coefficient value was dropped (family support with intention to exclusive breastfeeding). Thus, the modified model had 13 paths**.** The modified model was tested using a computer program. The results showed that there was one non-significant path from the 13 paths. The model revealed the acceptable fit with the data. The Chi-square test was 16.59 (p = .035), relative chi-square (2.07) was less than 3, NFI (.99) was more than .95, NNFI (.96) was more than .90, GFI (.98) was more than .90, AGFI (.91) was more than.90, CFI (.99) was more than .95, RMSEA (.02, .11) were acceptable (normal RMSEA <.08 and <.10), and SRMR (.04) was less than .08 or .05.

The overall research hypotheses were partially supported. The modified model presented breastfeeding knowledge, family support, workplace support, attitude toward breastfeeding, sufficient milk supply, and intention to exclusive breastfeeding affected directly and positively on breastfeeding duration (β = .26, p < .001; β = .13, p < .001;

β = .07, p < .05; β = .49, p < .001; β = .11, p < .01; β = .23, p < .001, respectively). In contrast, breastfeeding problems affected breastfeeding duration directly and negatively (β = -.11, p < .01). Breastfeeding initiation did not have a significant effect on breastfeeding duration (β = -.06, p > .05).

In addition, breastfeeding knowledge and intention to exclusive breastfeeding had direct and negative effect on breastfeeding initiation (β = -.17, p < .05; β = -.22, p < .01). Family support did not significantly affect breastfeeding initiation directly (β = -.06, p > .05). Breastfeeding knowledge and attitude toward breastfeeding affected intention to exclusive breastfeeding directly and positively (β = .42; β = .22, all p < .001, respectively). Breastfeeding knowledge and attitude toward breastfeeding affected breastfeeding initiation indirectly and negatively through intention to exclusive breastfeeding (β = -.09, p < .01; β = -.05, p < .001). Breastfeeding knowledge, family support, and intention to exclusive breastfeeding did not significantly have an indirect effect on breastfeeding duration through breastfeeding initiation (β = -.01, p > .05; β = .00, p > .05; β = .01, p > .05, respectively).

Contribution of the Study Results into Nursing Science

In the 1950s, nurses used empirical knowledge as science (Carper, 1978). Empirical knowledge was developed by hypothesis testing in which the empirical knowledge development processes are describing, explaining, and predicting (Chinn & Kramer, 2008). This study developed a model based on theory and empirical evidence. The Theory of Planned Behavior is used worldwide as a research framework in health and social sciences. This theory explains human behavior. Other empirical evidence was used to select the study variables. This study was conducted

in Indonesia to understand more about the predictive factors affecting breastfeeding duration among working Indonesian Muslim mothers. The results of this study provide a conceptual model to explain and predict the relationships among the study variables.

Empirical study enriches the body of knowledge in nursing (Chinn & Kramer, 2008). Most of the study results can be used to enrich the body of knowledge in nursing to improve breastfeeding duration, particularly the knowledge of predictive factors affecting breastfeeding duration among working Muslim mothers in Indonesia. Most of the study results can be used as basic knowledge to correct the short durations of breastfeeding among working mothers in Indonesia.

These study findings can be used as evidence to develop nursing knowledge and a foundation for future research. The hypothesized test results revealed that the model did not fit with empirical data. Then, the researcher modified the hypothesized model based on the statistical and empirical considerations. The modified model of breastfeeding duration test results showed that the model had a good model fit. Therefore, the Theory of Planned Behavior and five other concepts could be used to explain the breastfeeding duration. This study revealed that intention to exclusive breastfeeding was the significant factor influencing breastfeeding duration. Moreover, the attitude toward breastfeeding significantly predicted intention to exclusive breastfeeding and breastfeeding knowledge affected intention to breastfeeding directly and breastfeeding duration both directly and indirectly via intention to exclusive breastfeeding.

This study results provided new evidence regarding the combination between TPB and empirical evidence. Not all of the TPB variables were included in this study. Only variable which had evidence supported in Muslim and Indonesia population were included in this study. Comparing with those three previous models, this study provide new knowledge in terms of added four variables in the model, e.g., workplace support, breastfeeding problems, sufficient milk supply and breastfeeding initiation. This study did not support the family support concept. This study found that family support could not predict intention to exclusive breastfeeding and breastfeeding initiation. Breastfeeding knoewledge, attitude toward breastfeeding, and intention to exclusive breastfeeding was the three majors influencing factors of breastfeeding duration. The mediating effect of intention to exclusive breastfeeding on breastfeeding knowledge and attitude toward behavior on breastfeeding duration was a novel. However, breastfeeding initiation did not have a significant effect both direct and indirect on breastfeeding duration, so further studies to explore the causes are needed.

The Strengths and Limitations of this Study

The strengths of this study

1. Theoretical framework: This study used a well-known human behavior theory and six other concepts. The findings of this study contributed to the theory-based research and evidence-based nursing practice. These study findings also provided novel evidence regarding the mediating effect of breastfeeding initiation of breastfeeding knowledge, family support, and intention to exclusive breastfeeding into breastfeeding duration.

2. Methodology: The methodological strengths in this study were the research instruments have been developed and tested across countries with high validity and reliability of the research instruments, large sample size, multistage random sampling, and statistical analysis using path analysis. This study also recruited an equal number of mothers in terms of parity and infant gender. These study findings may be generalized to both primiparous and multiparous mothers and to both male and female infants.

The limitations of this study

1. A descriptive and cross sectional study was used as the research design in this research. Data were collected at 6 to 12 months after delivery. Therefore, the respondents may have forgotten the answer of some items, such as the exactly time of breastfeeding initiation of the current infant and the real score of breastfeeding intention before delivery. A longitudinal study from pregnancy, one hour after delivery, and six months after delivery would provide much better data.

2. The respondents in this study work outside the home, had no complications, and had a healthy infant. Therefore, the study findings cannot be generalized to mothers with different characteristics and various groups of lactating mothers. Testing the model across groups and different subject characteristics would provide evidence regarding the predictive factors of breastfeeding duration across groups and different characteristics.

Recommendations for Nursing Practice and Future Research

This study provides evidence for nursing practices and future research. The empirical model can be used as basic knowledge regarding factors affecting

breastfeeding duration among working Muslim mothers. The recommendations for nursing practice and future research are as follows.

Recommendations for nursing practice, administration, and education

These study findings provide some recommendations for nursing practice in order to improve the breastfeeding duration among lactating working mothers, particularly in the Muslim population. These study findings also provide recommendations for nursing administration and nursing education.

1. Recommendations for nursing practice

1) Assessing lactating working mothers who have risk factors for a short breastfeeding duration

This study found that there were significant, positive, and direct effects of breastfeeding knowledge, family support, workplace support, attitude toward breastfeeding, sufficient milk supply, and intention to exclusive breastfeeding on breastfeeding duration. It means that longer breastfeeding durations were predicted by higher breastfeeding knowledge, greater family support, higher workplace support, greater attitude toward breastfeeding, higher sufficient milk supply, and greater intention to exclusive breastfeeding. In contrast, breastfeeding problems affected breastfeeding duration directly and negatively. During pregnancy, nurses can assess a mother's breastfeeding knowledge, family support, workplace support, attitude toward breastfeeding, and intention to exclusive breastfeeding. Nurses should pay more attention to mothers who have low breastfeeding knowledge, family support, workplace support, attitude toward breastfeeding, and intention to exclusive breastfeeding.

In addition, there were significant, negative, and direct effects of breastfeeding problems on breastfeeding duration. Short breastfeeding duration may be caused by the occurrence of breastfeeding problems. Nurses may discuss with mothers regarding the prevention of breastfeeding problems and how to deal with these problems during antenatal care. As a result, the mother will have sufficient and appropriate knowledge regarding breastfeeding problems before delivery.

2) Improving intention to exclusive breastfeeding of lactating working mothers

This study supports the Theory of Planned Behavior and provides empirical evidence regarding the mediating effect of intention to perform a behavior. A greater intention to exclusive breastfeeding resulted in quicker breastfeeding initiation and longer breastfeeding duration of lactating working mothers in the Muslim population. Therefore, nurses may assess the mother's intention to exclusive breastfeeding during pregnancy and it is highly recommended that exclusive breastfeeding be included in the regular antenatal assessment program. Nurses should pay attention to mothers who have a low intention to exclusive breastfeeding during antenatal care. It is highly recommended to develop a culturally sensitive antenatal program to improve a mother's intention to exclusive breastfeeding in order to accelerate breastfeeding initiation and prolong breastfeeding duration among working Muslim mothers.

3) Preparing nursing care for lactating working Muslim mothers

Becoming a lactating working mother has several differences with a general lactating mother. Working mothers should deal with many obstacles to provide exclusive breastfeeding. However, the mothers can manage the breastfeeding

process to provide exclusive breastfeeding. Thus, lactation management is an important method to prepare a mother during pregnancy and after delivery. Nurses should have appropriate and sufficient knowledge regarding lactation management among working mothers before educating the mother. Then, the nurses can develop a lactation management program for education during antenatal care. Mothers who are well prepared regarding lactation management during pregnancy can be expected to have a higher intention to exclusive breastfeeding, quicker breastfeeding initiation, and longer exclusive breastfeeding. Nurses should recommend that family members be included in the lactation management program because family members take care of the infant when the mother is working outside the home. Nurses may involve the community and spiritual leaders to cultivate a working Muslim mother's intention to exclusive breastfeeding and to promote breastfeeding initiation and a long duration. Nurses should advocate for working mothers related to their right to get maternity leave after delivery and provide a breastfeeding facility in the workplace. Nurses should provide a sharing forum among lactating working mothers so they may support and help solve each other's breastfeeding problems.

4) Developing a nursing care program

A nursing care program integrate breastfeeding knowledge, attitude toward breastfeeding, and intention to exclusive breastfeeding will provide a significant effect on breastfeeding duration. Since those three variables were the major influencing factors of breastfeeding duration among working Muslim mothers in Central Java Province, Indonesia. The integrated program is proposed to extend the breastfeeding duration among working Muslim mothers in Central Java Province, Indonesia.

2. Recommendations for nursing administration

These study findings revealed that breastfeeding knowledge was the most significant factor of intention to exclusive breastfeeding and breastfeeding duration. In addition, the major source of breastfeeding information was the midwife. Nurse administrators may provide a lactation management training to nurse midwives to improve their knowledge regarding lactation management. Nurse administrators should encourage the nurse midwives to provide more breastfeeding education activities to pregnant mothers. Greater breastfeeding knowledge creates a greater intention to exclusive breastfeeding and longer breastfeeding duration.

3. Recommendations for nursing education

Undergraduate nursing students should have sufficient and appropriate knowledge regarding breastfeeding before they enter a clinical practice experiment. Breastfeeding knowledge may be included in a maternity nursing course. The nurse educators may encourage nursing students to do more investigations regarding breastfeeding duration among a specific population in order to better understand this nursing phenomenon.

Recommendations for future research

These study findings provide some recommendations for future research to improve the methodologies and outcomes.

1) Examine the causal model using a longitudinal study starting from the third trimester up to six months after delivery to provide more accurate data. Breastfeeding knowledge and attitude toward breastfeeding data can be collected during the antenatal period. Breastfeeding initiation data can be collected just after delivery. Then, family support, workplace support, breastfeeding problems, and sufficient milk supply data can be collected during the postpartum period. The last,

breastfeeding duration data can be collected at four and six months after delivery. The model also may be modified by adding some more variables or adding some more paths in the model based on current evidence.

2) The mediating effect of breastfeeding initiation was not significant in this study. It is new evidence. There are no previous studies to test the mediating effect of breastfeeding initiation to breastfeeding knowledge, family support, intention to exclusive breastfeeding, and breastfeeding duration. Another study is needed to test the ability of breastfeeding initiation to mediate the predictors and breastfeeding duration because breastfeeding initiation did not mediate breastfeeding knowledge, family support, and intention to exclusive breastfeeding on breastfeeding duration in this study.

3) The results of this study provide empirical evidence to develop intervention programs. A quasi-experiment or randomized control trial can be used as the methodology to test the effectiveness of the program. A program that aims to establish a strong intention to breastfeed is highly needed. In this study, intention to exclusive breastfeeding mediated breastfeeding knowledge and attitude toward breastfeeding on breastfeeding duration. In addition, attitude toward breastfeeding was the greatest influencing factor of breastfeeding duration. Furthermore, the breastfeeding knowledge, attitude toward breastfeeding, and intention to exclusive breastfeeding among working Muslim mothers in Central province were medium. Midwives were the major breastfeeding information source. A program includes midwives, community leader, and religious leader is proposed to increase intention to exclusive breastfeeding and extend breastfeeding duration. The program will be near perfection when it uses a longitudinal study.

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APPENDICES

Appendix A

Instruments

A Causal Model of Breastfeeding Duration among Muslim Working Mothers

In Central Java Province, Indonesia

Direction: Ten questionnaires will be answered in this study. These consist of:

1. Personal Characteristic Questionnaire
2. The Modified Malay-version of Breastfeeding Knowledge Questionnaire
3. The Modified Family Support Questionnaire
4. The Modified Workplace Breastfeeding Support Scale
5. The Modified Breastfeeding Attitude Questionnaire
6. The Breastfeeding Experience Scale
7. The Nine-item H & H Lactation Scale
8. The Intention to Exclusive Breastfeeding Scale
9. The Breastfeeding Initiation Scale
10. The Breastfeeding Duration Scale

ID number.....

Date of data collection.....

Place of data collection.....

Part I. Personal Characteristics Questionnaire

Direction: This questionnaire consists of 16 items regarding personal characteristics of mother (9 items), husband (2 items), and infant (5 items). Please make a mark (√) in the appropriate box or fill in the blank regarding your personal data.

Mother

1. Age .....in years
2. Parity

☐ 1 ☐ 3 ☐ >4

☐ 2 ☐ 4

.....

.....

15. Type of delivery

☐ 1. Vaginal ☐ 2. Forceps assisted delivery

☐ 3. ..... ☐ 4. .....

☐ 5. Cesarean section

16. Place of delivery

☐ 1. Hospital ☐ 2. Midwife clinic

☐ 3. .....

☐ 4..... ☐ 5. Parent's home

☐ 6. Other..... (Please specify)

Part II: The Modified Malay-Breastfeeding Knowledge Questionnaire

Code: _____

Date: _____

Direction: This questionnaire consists of 10 subscales and 49 items regarding breastfeeding knowledge. Please read the following sentences and make a mark (√) in the appropriate each answer. There are 2 choices available: 1 = correct and 0 = Incorrect.

For example:

No	Item	Correct (1)	Incorrect (0)
1.	Colostrum contains poison.		√

Note: I know that colostrum does not contain poison.

No	Items	Correct (1)	Incorrect (0)
	Advantages to baby		
1.	Breastfeeding reduces the risk of lung infection among baby.	√	
2.	Breastfeeding increases the baby's intelligence.	√	
3.	Breastfeeding helps to reduce the incidence of child abuse and neglect.	√	
	.....		
	.....		
48.	In order to maintain breastmilk production, working mother have to pumping the breastmilk in the office.***		
49.	A properly latch on position prevents sore nipples. ***	√	

Note: *negative items, **modified items, ***added items, and √ means the best answer. These symbols will not be on the questionnaire given to the mother. The using and modification of this questionnaire in this study was permitted by Dr. Tengku Alina Tengku Ismail and Dr. Zaharah Sulaiman in October 17, 2013.

Interpretation:

1. Negative scores (15 items) are reversed.
2. The ratings of all items are entered.
3. Calculate the right answers and wrong answers.
4. Calculate the mean scores of right answers.

Part III: The Modified Family Support Questionnaire

Code: _____

Date: _____

Direction: This questionnaire consists of four subscales and 22 items regarding family support on your breastfeeding to your infant. Please read the following sentences and make a mark **(√)** in the appropriate each answer.

There are 5 choices available:

1 = Never

2 = Sometimes

3 = Often

4 = Very often

5 = Always

For example:

No	Item	Never (1)	Sometimes (2)	Often (3)	Very often (4)	Always (5)
1.	My husband massages my shoulder to make me feel relax after breastfeeding.			√		

Note: My husband often massages my shoulder to make me feel relax after breastfeeding.

No	Items	Never (1)	Sometimes (2)	Often (3)	Very often (4)	Always (5)
	Dimension 1: Emotional support					
1.	My family members encourage me to breastfeeding.					
2.	My family shows empathy to me when I have problems related to breastfeeding.					

No	Items	Never (1)	Sometimes (2)	Often (3)	Very often (4)	Always (5)
3.	My family gives me cheerfulness when I have problems related to breastfeeding.					
4.	My family helps me to relax by taking care of my baby.					
	.....					
	.....					
	.....					
21.	My family appreciates me about giving breastfeeding.					
22.	My family helps me how to solve the common breastfeeding problems.					

Note: ***added items. The using and modification of this questionnaire was permitted by Rani Lipika Biswash on November 13, 2013.

Interpretation:

1. The ratings of all items are entered.
2. Calculate the total scores.
3. Calculate the mean scores.

Part IV: The Modified Workplace Support Questionnaire

Code: _____

Date: _____

Direction: This questionnaire consists of four subscales and 12 items regarding workplace support on your breastfeeding process since you go back to work. Please read the following sentences and make a mark **(**√) in the appropriate each answer. There are 7 choices available:

1 = Strongly disagree

2 = Disagree

3 = Somewhat disagree

4 = Neutral

5 = Somewhat agree

6= Agree

7 = Strongly agree

For example:

Subscales/items	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neutral (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
1. My coworkers share their experience while breastfeeding their infant.						√	

Note: I agree that my coworkers sharing their breastfeeding experience to me.

Subscales/items	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neutral (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Dimension 1: Technical support							
1. I can easily find a quiet place other than the bathroom at my work to pump breast milk.							

Subscales/items	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neutral (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
2. My workplace has a refrigerator that I can use to store my milk.							
....							
....							
12. My coworkers listen to me talk about my breastfeeding experience.							

Note: **modified items. The using and modification of this questionnaire in this study was permitted by Assoc. Prof. Dr. Yeon Bai in October 17, 2013.

Interpretation:

1. The ratings of all items are entered.
2. Calculate the mean scores in each dimension.

Part V: The Modified Breastfeeding Attitude Questionnaire

Code: _____

Date: _____

Direction: This questionnaire consists of two subscales: breastfeeding beliefs (25 items) and outcome evaluation of breastfeeding beliefs (25 items). Please make a mark (√) in the column to represent the best choice based on your opinion. The rating scales are as follows:

Strongly disagree (1) = I do not really agree with the statement
Disagree (2) = I do not agree with the statement
Uncertain (3) = I am not sure about the statement
Agree (4) = I agree with the statement
Strongly agree (5) = I really agree with the statement

For example:

Items	Strongly disagree (1)	Disagree (2)	Uncertain (3)	Agree (4)	Strongly agree (5)
1. Breastfeeding is painful for you.			√		

Note: I do not really believe that breastfeeding is painful for me.

Items	Strongly disagree (1)	Disagree (2)	Uncertain (3)	Agree (4)	Strongly agree (5)
Dimension 1: Breastfeeding beliefs: I believe that.....					
1. Breastfeeding protects the baby from infectious diseases.					
2. Breastfeeding is embarrassing for you.*					
3. Breastfeeding limits your social life.*					
.....					
.....					

Items	Strongly disagree (1)	Disagree (2)	Uncertain (3)	Agree (4)	Strongly agree (5)
47. Breastfeeding establishes close bond between you and you baby.					
48. Before six months, banana cannot satisfy your baby's hungry is very important to you.**					
49. The God give rewards to mother who breastfeeding her infant, it is very important to you. ***					
50. Islam encourages mother to breastfeeding up to 2 years, it very is important to you.***					

Note: *scoring reversed, **modified items, and ***added items. These symbols will not be on the questionnaire given to the mother. The using and modification of this questionnaire in this study was permitted by Shanzida Khatun in October 9, 2013.

Interpretation:

1. Negative scores are reversed.
2. The ratings of all items are entered.
3. The breastfeeding attitude score are obtained by multiplying the score of breastfeeding belief (b_1) and the score of outcome evaluation of breastfeeding beliefs (e_1), summing the result of these multiplication
4. The mean score is obtained by dividing the total score by number of items.
5. The formula to calculate total score of breastfeeding attitude is $\frac{\sum (b_1 e_1)}{n}$

Part VI: The Breastfeeding Experience Scale

Code: _____

Date: _____

Direction: This questionnaire consists of 17 multiple-choice items and one open-end item regarding breastfeeding problems on your breastfeeding process. Please read the following sentences and make a mark (√) if you experience the problems during breastfeeding. There are 5 choices available:

1 = Not at all

2 = Mild

3 = Moderate

4 = Severe

5 = Unbearable

For example:

Items	Not at all (1)	Mild (2)	Moderate (3)	Severe (4)	Unbearable (5)
1. Wet clothes during working		√			

Note: I experienced a mild problem of wet clothes after breast milk pumping at the working place.

Items	Not at all (1)	Mild (2)	Moderate (3)	Severe (4)	Unbearable (5)
1. Sore nipple (s)					
2. Cracked nipple (s)					
.....					
.....					
17. Difficulty combining work and breastfeeding					
18. Other (please write in).....					

Note. The using of this questionnaire in this study was permitted by Assoc. Prof. Dr. Karen Wambach in October 3, 2013.

Interpretation: (information from the scale developer by personal communication via email)

1. The ratings of all items are entered.
2. Calculate the mean score of BES and data will present as mean and median.

Part VII: The Nine-item of H & H Lactation Scale

Code: _____

Date: _____

Direction: This scale consists of 3 subscales and 9 items regarding insufficient milk supply. Please read the following sentences and make a mark (√**)** in the appropiate each answer that you feel about breastfeeding. There is no wrong answer in this scale. There are 7 scales:

1 = strongly disagree

2 = Disagree

3 = Somewhat disagree

4 = Neutral

5 = Somewhat agree

6 = Agree

7 = Strongly agree

For example:

Subscales/items	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neutral (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
1. The breast milk only can fulfil my infant's nutrition need up to six months.							√

Note. I am very agree that breast milk only can fulfil my infant's nutrition need up to six months.

Subscales/items	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neutral (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Subscale 1: Maternal Confident/Commitment Breastfeeding							
1. I believe I can solve my breastfeeding problems which come along.							

2. My baby would only get a bottle if I am not available for breastfeeding.							
.....							
.....							
3. My baby appeared to enjoy breastfeeding.							

Note. * mean scoring reversed. These symbol will not be on the questionnaire given to the mother. The using of this questionnaire in this study was permitted by Assoc. Prof. Dr. Busakorn Punthmatharith on November 25, 2013.

Interpretation:

1. Negative scores are reversed.
2. The ratings of all items are entered.
3. Calculate the average mean of individual item scores.
4. Calculate the average mean of each subscale (combination scores).

Part VIII: The Breastfeeding Initiation Scale

Code: _____

Date: _____

Direction: This scale consists of one item regarding breastfeeding initiation. Please answer the question of how many minutes/hours after delivery you start breastfeeding your infant.

1. How many minutes/hours.....?

   Answer: …….

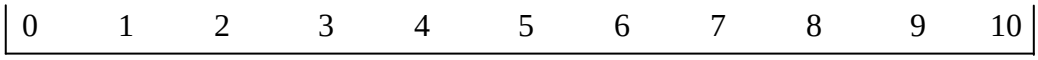
Part IX: The Intention to Exclusive Breastfeeding Scale

Code: _____

Date: _____

Direction: This scale consists of one item regarding intention to exclusively breastfeeding of mothers. Please tell or make a mark (X) the degree of how much you intend to provide breast milk only to your baby for at least six months when you were on the third trimester of pregnancy.

1. How did you intend.....?



....

Note. The using of this questionnaire in this study was permitted by Sanzida Khatun in October 9, 2013.

Part X: The Breastfeeding Duration Scale

Code: _____

Date: _____

Direction: This scale consists of one item regarding the length of mother provide breast milk only as infant feeding source to her infant. Please answer the question of how many months/days you provide breast milk only as infant feeding source to your infant.

1. How many days/months.....?

   Answer: .....days.....months

Appendix B

Permission of Using the Study Instruments

Part I: Permission of Using the Malay version of Breastfeeding Knowledge Questionnaire
From: alina tengku <dramnna1997@yahoo.com>
To: Mekar Anggraeni <mekar.dwi@gmail.com>
Sent: Wednesday, October 2, 2013
Subject: RE: Asking permission for using the Malay-version of Breastfeeding Knowledge Questionnaire

Dear Mekar Dwi Anggraeni,

Thank you for your interest in the above study.
We do not have any problem for you to use the validated Malay-version Breastfeeding Knowledge Questionnaire. Attached here is the questionnaire, both in Malay and English version.

Alina

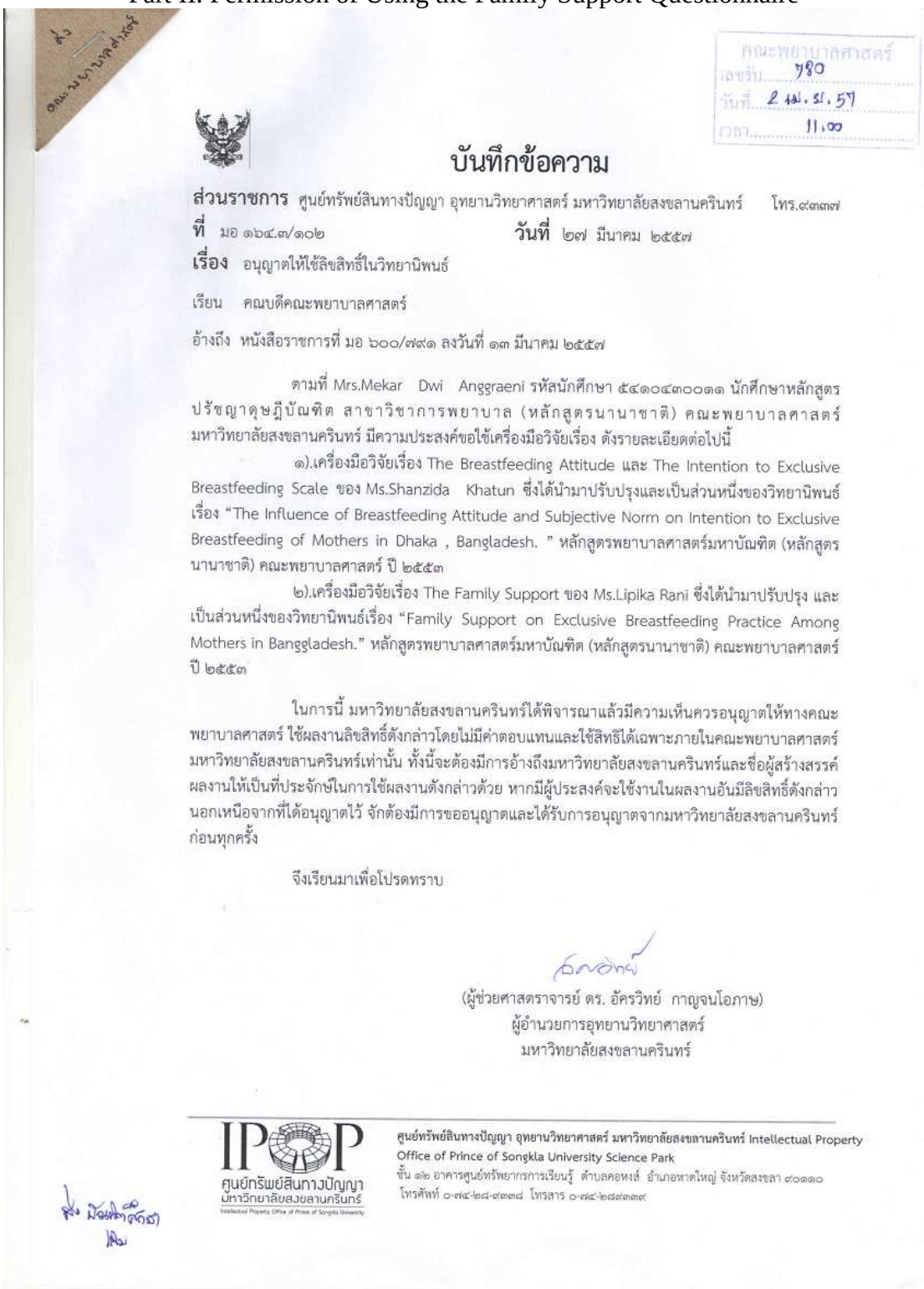
-----Original Message-----
From: Mekar Anggraeni <mekar.dwi@gmail.com>
To: alina tengku <dramnna1997@yahoo.com>
Sent: Monday, September 30, 2013
Subject: Asking permission for using the Malay-version of Breastfeeding Knowledge Questionnaire

Dear Dr. Tengku Alina Tengku Ismail,

I am Mekar Dwi Anggraeni, a Doctoral student of Faculty of Nursing (International Program), Prince of Songkla University, Thailand.
My major is in Maternal and Child Nursing.
I am going to conduct my dissertation entitled: “A Causal model of Exclusive Breastfeeding duration among Muslim working mothers".
Based on my literature review about factors influencing exclusive breastfeeding among Muslim working mothers, I and my advisory committee have decided to use the Malay-version of Breastfeeding Knowledge Questionnaire.
Therefore, I ask your permission as the first author of the Malay-version of Breastfeeding Knowledge Questionnaire to use this questionnaire in my study.
I am under supervision Assoc.Prof.Dr. Busakorn Punthmatharith as my advisory and Assist.Prof.Dr.Wongchan Petpichetcian as my co advisory.

Thank you for your attention and kind consideration.
I look forward to hearing from you.
Best regards,
Mekar Dwi Anggraeni
Doctoral student
Faculty of Nursing, Prince of Songkla University
Thailand

Part II: Permission of Using the Family Support Questionnaire



คณะพยาบาลศาสตร์
เลขรับ 780
วันที่ 2 เม.ย. 57
เวลา 11.00

บันทึกข้อความ

ส่วนราชการ ศูนย์ทรัพย์สินทางปัญญา อุทยานวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ โทร.๙๓๓๗

ที่ มอ ๑๖๔.๓/๑๐๒ **วันที่** ๒๗ มีนาคม ๒๕๕๗

เรื่อง อนุญาตให้ใช้ลิขสิทธิ์ในวิทยานิพนธ์

เรียน คณบดีคณะพยาบาลศาสตร์

อ้างถึง หนังสือราชการที่ มอ ๖๐๐/๗๙๑ ลงวันที่ ๑๓ มีนาคม ๒๕๕๗

ตามที่ Mrs.Mekar Dwi Anggraeni รหัสนักศึกษา ๕๔๑๐๔๓๐๐๑๑ นักศึกษาหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาการพยาบาล (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์ มีความประสงค์ขอใช้เครื่องมือวิจัยเรื่อง ดังรายละเอียดต่อไปนี้

๑).เครื่องมือวิจัยเรื่อง The Breastfeeding Attitude และ The Intention to Exclusive Breastfeeding Scale ของ Ms.Shanzida Khatun ซึ่งได้นำมาปรับปรุงและเป็นส่วนหนึ่งของวิทยานิพนธ์เรื่อง "The Influence of Breastfeeding Attitude and Subjective Norm on Intention to Exclusive Breastfeeding of Mothers in Dhaka , Bangladesh. " หลักสูตรพยาบาลศาสตร์มหาบัณฑิต (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ ปี ๒๕๕๓

๒).เครื่องมือวิจัยเรื่อง The Family Support ของ Ms.Lipika Rani ซึ่งได้นำมาปรับปรุง และเป็นส่วนหนึ่งของวิทยานิพนธ์เรื่อง "Family Support on Exclusive Breastfeeding Practice Among Mothers in Banggladesh." หลักสูตรพยาบาลศาสตร์มหาบัณฑิต (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ ปี ๒๕๕๓

ในการนี้ มหาวิทยาลัยสงขลานครินทร์ได้พิจารณาแล้วมีความเห็นควรอนุญาตให้ทางคณะพยาบาลศาสตร์ ใช้ผลงานลิขสิทธิ์ดังกล่าวโดยไม่มีค่าตอบแทนและใช้สิทธิได้เฉพาะภายในคณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์เท่านั้น ทั้งนี้จะต้องมีการอ้างถึงมหาวิทยาลัยสงขลานครินทร์และชื่อผู้สร้างสรรค์ผลงานให้เป็นที่ประจักษ์ในการใช้ผลงานดังกล่าวด้วย หากมีผู้ประสงค์จะใช้งานในผลงานอันมีลิขสิทธิ์ดังกล่าวนอกเหนือจากที่ได้อนุญาตไว้ จักต้องมีการขออนุญาตและได้รับการอนุญาตจากมหาวิทยาลัยสงขลานครินทร์ก่อนทุกครั้ง

จึงเรียนมาเพื่อโปรดทราบ

(ผู้ช่วยศาสตราจารย์ ดร. อัครวิทย์ กาญจนโอภาษ)
ผู้อำนวยการอุทยานวิทยาศาสตร์
มหาวิทยาลัยสงขลานครินทร์

IPOP ศูนย์ทรัพย์สินทางปัญญา มหาวิทยาลัยสงขลานครินทร์ Intellectual Property Office of Prince of Songkla University

ศูนย์ทรัพย์สินทางปัญญา อุทยานวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ Intellectual Property Office of Prince of Songkla University Science Park
ชั้น ๑๒ อาคารศูนย์ทรัพยากรการเรียนรู้ ตำบลคอหงส์ อำเภอหาดใหญ่ จังหวัดสงขลา ๙๐๑๑๐
โทรศัพท์ ๐-๗๔-๒๘-๙๓๓๘ โทรสาร ๐-๗๔-๒๘๙๓๓๙

From:lipika biswas lipika019@gmail.com
To: Mekar Anggraeni <mekar.dwi@gmail.com>
Sent: Thursday, November 15, 2013
Subject: Asking permission for using The Family Support Questionnaire

Dear Mekar,

You can use the Family Support Questionnaire in your study.
Please cite my name in your study

Regards,
Lipika Biswas

-----Original Message-----
From: Mekar Anggraeni <mekar.dwi@gmail.com>
To: lipika biswas <lipika019@gmail.com>
Sent: Thursday, October 31, 2013
Subject: Asking permission for using The Family Support Questionnaire

Dear Ms. Lipika Rani Biswas,
I am Mekar Dwi Anggraeni, a Doctoral student of Faculty of Nursing (International Program), Prince of Songkla University, Thailand.
My major is in Maternal and Child Nursing.
I am going to conduct my dissertation entitled: “A Causal model of Exclusive Breastfeeding duration among Muslim working mothers".
Based on my literature review about factors influencing exclusive breastfeeding among Muslim working mothers, I and my advisory committee have decided to use the Family Support Questionnaire.
Therefore, I ask your permission as the first author of the Family Support Questionnaire to use this questionnaire in my study.
I am under supervision Assoc.Prof.Dr. Busakorn Punthmatharith as my advisory and Assist.Prof.Dr.Wongchan Petpichetcian as my co advisory.

Thank you for your attention and kind consideration.
I look forward to hearing from you.
Best regards,
Mekar Dwi Anggraeni
Doctoral student
Faculty of Nursing, Prince of Songkla University
Thailand

Part III: Permission of Using the Workplace Breastfeeding Support Scale

From: Yeon Bai <baiy@mail.montclair.edu>
To: Mekar Anggraeni <mekar.dwi@gmail.com>
Sent: Thursday, October 17, 2013
Subject: RE: Asking permission for using the The Workplace Breastfeeding Support Scale

Mekar,

Sure, I am glad to know that the instrument is used widely.

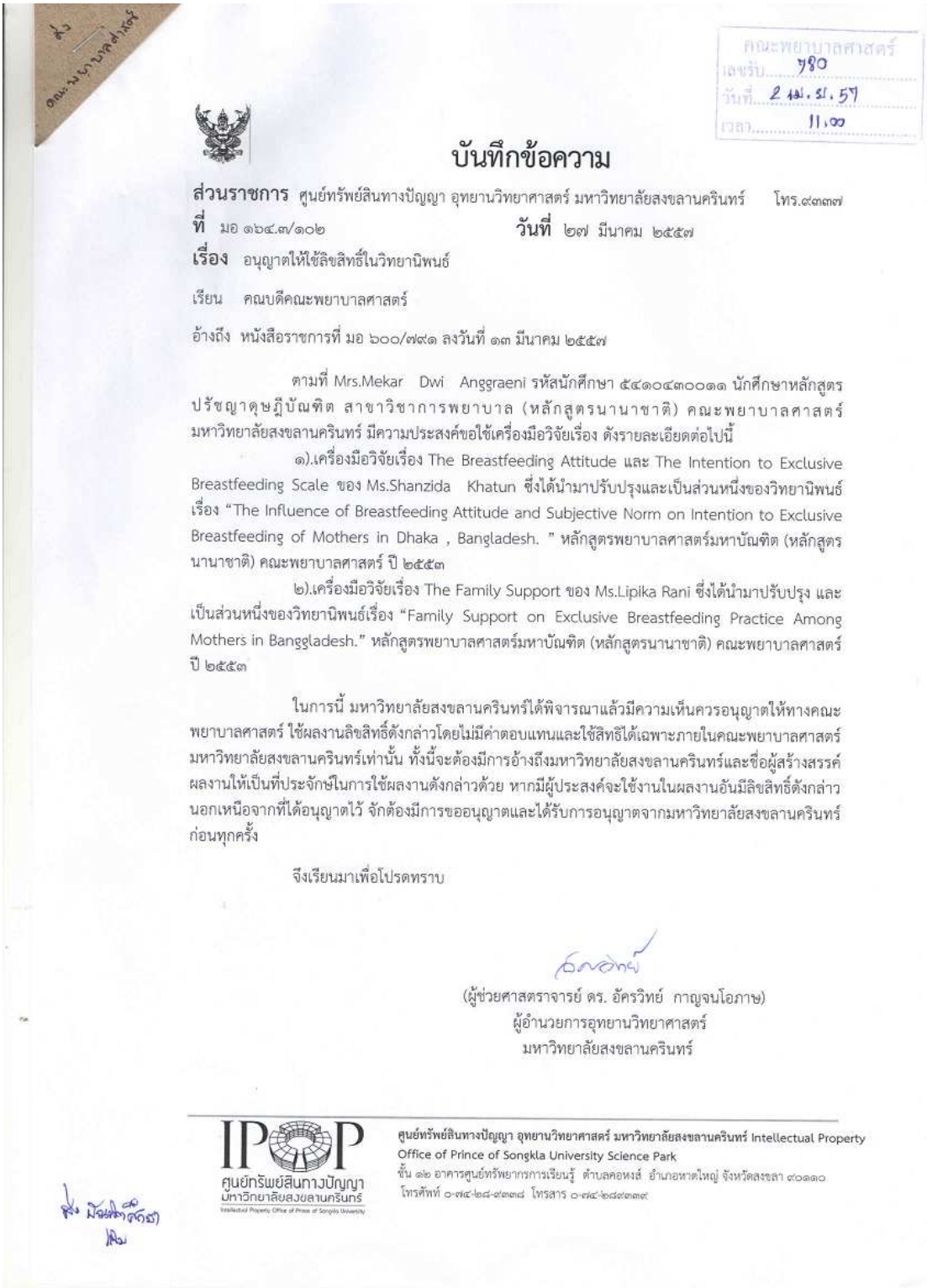
Yeon Bai

-----Original Message-----
From: Mekar Anggraeni <mekar.dwi@gmail.com>
To: Yeon Bai <baiy@mail.montclair.edu>
Sent: Monday, September 30, 2013
Subject: Asking permission for using The Workplace Breastfeeding Support Scale

Dear Professor. Bai,

I am Mekar Dwi Anggraeni, a Doctoral student of Faculty of Nursing (International Program), Prince of Songkla University, Thailand.
My major is in Maternal and Child Nursing.
I am going to conduct my dissertation entitled: “A Causal model of Exclusive Breastfeeding duration among Muslim working mothers".
Based on my literature review about factors influencing exclusive breastfeeding among Muslim working mothers, I and my advisory committee have decided to use the workplace breastfeeding support scale (WBSS).
Therefore, I ask your permission as the first author of the workplace breastfeeding support scale (WBSS) to use this scale in my study.
Thank you for your attention and kind consideration.
I look forward to hearing from you.
Best regards,
Mekar Dwi Anggraeni
Doctoral student
Faculty of Nursing, Prince of Songkla University
Thailand

Part IV: Permission of Using the Breastfeeding Attitude Questionnaire



คณะพยาบาลศาสตร์
เลขรับ 780
วันที่ 2 เม.ย. 57
เวลา 11.00

บันทึกข้อความ

ส่วนราชการ ศูนย์ทรัพย์สินทางปัญญา อุทยานวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ โทร.๙๓๓๗
ที่ มอ ๑๖๔.๓/๑๐๒ **วันที่** ๒๗ มีนาคม ๒๕๕๗
เรื่อง อนุญาตให้ใช้ลิขสิทธิ์ในวิทยานิพนธ์

เรียน คณบดีคณะพยาบาลศาสตร์

อ้างถึง หนังสือราชการที่ มอ ๖๐๐/๗๙๑ ลงวันที่ ๑๓ มีนาคม ๒๕๕๗

ตามที่ Mrs.Mekar Dwi Anggraeni รหัสนักศึกษา ๕๔๑๐๔๓๐๐๑๑ นักศึกษาหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาการพยาบาล (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์ มีความประสงค์ขอใช้เครื่องมือวิจัยเรื่อง ดังรายละเอียดต่อไปนี้

๑).เครื่องมือวิจัยเรื่อง The Breastfeeding Attitude และ The Intention to Exclusive Breastfeeding Scale ของ Ms.Shanzida Khatun ซึ่งได้นำมาปรับปรุงและเป็นส่วนหนึ่งของวิทยานิพนธ์เรื่อง "The Influence of Breastfeeding Attitude and Subjective Norm on Intention to Exclusive Breastfeeding of Mothers in Dhaka , Bangladesh. " หลักสูตรพยาบาลศาสตร์มหาบัณฑิต (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ ปี ๒๕๕๓

๒).เครื่องมือวิจัยเรื่อง The Family Support ของ Ms.Lipika Rani ซึ่งได้นำมาปรับปรุง และเป็นส่วนหนึ่งของวิทยานิพนธ์เรื่อง "Family Support on Exclusive Breastfeeding Practice Among Mothers in Banggladesh." หลักสูตรพยาบาลศาสตร์มหาบัณฑิต (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ ปี ๒๕๕๓

ในการนี้ มหาวิทยาลัยสงขลานครินทร์ได้พิจารณาแล้วมีความเห็นควรอนุญาตให้ทางคณะพยาบาลศาสตร์ ใช้ผลงานลิขสิทธิ์ดังกล่าวโดยไม่มีค่าตอบแทนและใช้สิทธิได้เฉพาะภายในคณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์เท่านั้น ทั้งนี้จะต้องมีการอ้างถึงมหาวิทยาลัยสงขลานครินทร์และชื่อผู้สร้างสรรค์ผลงานให้เป็นที่ประจักษ์ในการใช้ผลงานดังกล่าวด้วย หากมีผู้ประสงค์จะใช้งานในผลงานอันมีลิขสิทธิ์ดังกล่าวนอกเหนือจากที่ได้อนุญาตไว้ จักต้องมีการขออนุญาตและได้รับการอนุญาตจากมหาวิทยาลัยสงขลานครินทร์ก่อนทุกครั้ง

จึงเรียนมาเพื่อโปรดทราบ

(ผู้ช่วยศาสตราจารย์ ดร. อัครวิทย์ กาญจนโอภาษ)
ผู้อำนวยการอุทยานวิทยาศาสตร์
มหาวิทยาลัยสงขลานครินทร์

IPOP ศูนย์ทรัพย์สินทางปัญญา มหาวิทยาลัยสงขลานครินทร์ Intellectual Property Office of Prince of Songkla University

ศูนย์ทรัพย์สินทางปัญญา อุทยานวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ Intellectual Property Office of Prince of Songkla University Science Park
ชั้น ๑๒ อาคารศูนย์ทรัพยากรการเรียนรู้ ตำบลคอหงส์ อำเภอหาดใหญ่ จังหวัดสงขลา ๙๐๑๑๐
โทรศัพท์ ๐-๗๔-๒๘-๙๓๓๘ โทรสาร ๐-๗๔-๒๘๙๓๓๙

From: Sanzidaadib@yahoo.com
To: Mekar Anggraeni <mekar.dwi@gmail.com>
Sent: Wednesday, October 9, 2013
Subject: RE: Asking permission for using the Breastfeeding Attitude Questionnaire

Dear Mekar
I am so sorry for late reply. Just now I got your mail and knew about your massage because I am very busy regarding my PhD admission procedure. You can use my Breastfeeding Attitude Questionnaire. If you need soft copy I may send to you or you can get it from my Advisor (Ajarn Busakorn).

Best wishes
Shanzida

-----Original Message-----
From: Mekar Anggraeni <mekar.dwi@gmail.com>
To: Sanzidaadib@yahoo.com
Sent: Monday, September 30, 2013 9:21 AM
Subject: Asking permission for using the Breastfeeding Attitude Questionnaire

Dear Ms.Sanzida Khatun,

I am Mekar Dwi Anggraeni, a Doctoral student of Faculty of Nursing (International Program), Prince of Songkla University, Thailand.
My major is in Maternal and Child Nursing.
I am going to conduct my dissertation entitled: “A Causal model of Exclusive Breastfeeding duration among Muslim working mothers".
Based on my literature review about factors influencing exclusive breastfeeding among Muslim working mothers, I and my advisory committee have decided to use the Breastfeeding Attitude Questionnaire. Therefore, I ask your permission as the first author of the Breastfeeding Attitude Questionnaire to use this scale in my study.
I am under supervision Assoc. Prof. Dr.Busakorn Punthmatharith as the major advisory and Assist. Prof. Dr. Wongchan Petchietcian as my co advisory.

Thank you for your attention and kind consideration.
I look forward to hearing from you.
Best regards,
Mekar Dwi Anggraeni
Doctoral student
Faculty of Nursing, Prince of Songkla University
Thailand

Part V: Permission of Using the Breastfeeding Experience Scale

From: Karen Wambach <kwambach@kumc.edu>
To: Mekar Anggraeni <mekar.dwi@gmail.com>
Sent: Wednesday, October 9, 2013
Subject: RE: Asking permission for using The Breastfeeding Experience Scale

Hello Mekar....

You have my permission to use the BES.
Will you be using it in English language or are you planning on using Thai?
Please let me know.
Attached is the scale and information on it.
Please keep me appraised of your progress and any psychometric (reliability information) you obtain on the BES.
Good luck with your research.

Dr Wambach

-----Original Message-----
From: Mekar Anggraeni <mekar.dwi@gmail.com>
To: Karen Wambach <kwambach@kumc.edu>
Sent: Monday, September 30, 2013 9:21 AM
Subject: Asking permission for using The Breastfeeding Experience Scale

Dear Assoc.Prof.Dr. Wambach,

I am Mekar Dwi Anggraeni, a Doctoral student of Faculty of Nursing (International Program), Prince of Songkla University, Thailand.
My major is in Maternal and Child Nursing.
I am going to conduct my dissertation to complete my degree entitled: “A Causal model of Exclusive Breastfeeding duration among Muslim working mothers".
Based on my literature review about factors influencing exclusive breastfeeding, I and my advisory committee have decided to use the Breastfeeding Experience Scale to measure breastfeeding problems.
Therefore, I ask your permission as the first author of The Breastfeeding Experience Scale to use this scale in my study.
Thank you for your attention and kind consideration.
I look forward to hearing from you.
Best regards,
Mekar Dwi Anggraeni
Doctoral student
Faculty of Nursing, Prince of Songkla University
Thailand

Part VI: Permission of Using the Nine items of H & H Scale

Faculty of Nursing
Prince of Songkla University
Hat Yai, Songkhla 90112 Thailand

November 25, 2013

Subject: Asking for a permission to translate, adapt, and use the Thai-version of H & H Lactation Scale

Dear Asst. Prof. Dr. Busakorn Punthmatharith,

I am Mekar Dwi Anggraeni, a full time Doctoral student in Faculty of Nursing, Prince of Songkla University, Thailand. I will conduct a study as part of the requirements for the degree of doctor of philosophy in nursing. My dissertation entitled "A Causal Model of Breastfeeding among Muslim Working Mothers in Central Java Province, Indonesia."

Based on my literature review about factors influencing exclusive breastfeeding among Muslim working mothers, I and my advisors have decided to use the Thai-version of H & H Lactation Scale to measure the insufficient milk supply variable. Therefore, I ask your permission as the first author of the Thai-version of H & H Lactation Scale to translate, adapt, and use this scale in my study. I am under supervision of Asst. Prof. Dr. Busakorn Punthmatharith as my advisor and Asst. Prof. Dr. Wongchan Petpichetcian as my co advisor.

Thank you so much for your attention and kind consideration to this request.
I look forward to hearing from you.

Sincerely yours,

(Mekar Dwi Anggraeni)
Doctoral student
Faculty of Nursing, Prince of Songkla University
Thailand

(Asst. Prof. Dr. Busakorn Punthmatharith)
Advisor
Faculty of Nursing, Prince of Songkla University
Thailand

Your signature on the line below will give me your permission to translate, adapt, and use your research instrument in my dissertation.

Signature: _____
Name : Asst. Prof. Dr. Busakorn Punthmatharith
Date : 26/11/2013

Part VII: Permission of Using the Intention to Exclusive Breastfeeding Scale

คณะพยาบาลศาสตร์
เลขรับ 780
วันที่ 2 เม.ย. 57
เวลา 11.00

บันทึกข้อความ

ส่วนราชการ ศูนย์ทรัพย์สินทางปัญญา อุทยานวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ โทร.๙๓๓๗

ที่ มอ ๑๖๔.๓/๑๐๒ **วันที่** ๒๗ มีนาคม ๒๕๕๗

เรื่อง อนุญาตให้ใช้ลิขสิทธิ์ในวิทยานิพนธ์

เรียน คณบดีคณะพยาบาลศาสตร์

อ้างถึง หนังสือราชการที่ มอ ๖๐๐/๗๙๑ ลงวันที่ ๑๓ มีนาคม ๒๕๕๗

ตามที่ Mrs.Mekar Dwi Anggraeni รหัสนักศึกษา ๕๔๑๐๔๓๐๐๑๑ นักศึกษาหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาการพยาบาล (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์ มีความประสงค์ขอใช้เครื่องมือวิจัยเรื่อง ดังรายละเอียดต่อไปนี้

๑).เครื่องมือวิจัยเรื่อง The Breastfeeding Attitude และ The Intention to Exclusive Breastfeeding Scale ของ Ms.Shanzida Khatun ซึ่งได้นำมาปรับปรุงและเป็นส่วนหนึ่งของวิทยานิพนธ์เรื่อง "The Influence of Breastfeeding Attitude and Subjective Norm on Intention to Exclusive Breastfeeding of Mothers in Dhaka , Bangladesh. " หลักสูตรพยาบาลศาสตร์มหาบัณฑิต (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ ปี ๒๕๕๓

๒).เครื่องมือวิจัยเรื่อง The Family Support ของ Ms.Lipika Rani ซึ่งได้นำมาปรับปรุง และเป็นส่วนหนึ่งของวิทยานิพนธ์เรื่อง "Family Support on Exclusive Breastfeeding Practice Among Mothers in Banggladesh." หลักสูตรพยาบาลศาสตร์มหาบัณฑิต (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ ปี ๒๕๕๓

ในการนี้ มหาวิทยาลัยสงขลานครินทร์ได้พิจารณาแล้วมีความเห็นควรอนุญาตให้ทางคณะพยาบาลศาสตร์ ใช้ผลงานลิขสิทธิ์ดังกล่าวโดยไม่มีค่าตอบแทนและใช้สิทธิได้เฉพาะภายในคณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์เท่านั้น ทั้งนี้จะต้องมีการอ้างถึงมหาวิทยาลัยสงขลานครินทร์และชื่อผู้สร้างสรรค์ผลงานให้เป็นที่ประจักษ์ในการใช้ผลงานดังกล่าวด้วย หากมีผู้ประสงค์จะใช้งานในผลงานอันมีลิขสิทธิ์ดังกล่าวนอกเหนือจากที่ได้อนุญาตไว้ จักต้องมีการขออนุญาตและได้รับการอนุญาตจากมหาวิทยาลัยสงขลานครินทร์ก่อนทุกครั้ง

จึงเรียนมาเพื่อโปรดทราบ

(ผู้ช่วยศาสตราจารย์ ดร. อัครวิทย์ กาญจนโอภาษ)
ผู้อำนวยการอุทยานวิทยาศาสตร์
มหาวิทยาลัยสงขลานครินทร์

ศูนย์ทรัพย์สินทางปัญญา
มหาวิทยาลัยสงขลานครินทร์

ศูนย์ทรัพย์สินทางปัญญา อุทยานวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ Intellectual Property Office of Prince of Songkla University Science Park
ชั้น ๑๒ อาคารศูนย์ทรัพยากรการเรียนรู้ ตำบลคอหงส์ อำเภอหาดใหญ่ จังหวัดสงขลา ๙๐๑๑๐
โทรศัพท์ ๐-๗๔-๒๘-๙๓๓๘ โทรสาร ๐-๗๔-๒๘๙๓๓๙

From: Sanzidaadib@yahoo.com

To: Mekar Anggraeni <mekar.dwi@gmail.com>
Sent: Wednesday, October 9, 2013
Subject: RE: Asking permission for using the intention to EBF Scale

Dear Mekar,
It is great pleasure for me that you want to use my Instrument in your study. I am giving permission to you that you may use 'Intention to EBF Scale'. If it is possible you may ask my advisor Ajarn Busakorn and she was another author as well.

Best wishes
Shanzida

-----Original Message-----
From: Mekar Anggraeni <mekar.dwi@gmail.com>
To: Sanzidaadib@yahoo.com
Sent: Monday, September 30, 2013 9:21 AM
Subject: Asking permission for using the intention to EBF Scale

Dear Ms. Sanzida Khatun,

I am Mekar Dwi Anggraeni, a Doctoral student of Faculty of Nursing (International Program), Prince of Songkla University, Thailand.
My major is in Maternal and Child Nursing.
I am going to conduct my dissertation entitled: “A Causal model of Exclusive Breastfeeding duration among Muslim working mothers".
Based on my literature review about factors influencing exclusive breastfeeding among Muslim working mothers, I and my advisory committee have decided to use the intention to EBF scale.
Therefore, I ask your permission as the first author of the intention to EBF scale to use this scale in my study.
I am under supervision Assoc.Prof.Dr. Busakorn Punthmatharith as my advisory and Assist.Prof.Dr.Wongchan Petpichetcian as my co advisory.

Thank you for your attention and kind consideration.
I look forward to hearing from you.
Best regards,
Mekar Dwi Anggraeni
Doctoral student
Faculty of Nursing, Prince of Songkla University
Thailand

Appendix C

Informed Consent Form

Title: A causal model of breastfeeding duration among Muslim working mothers In Central Java Province, Indonesia

Researcher: Mekar Dwi Anggraeni, Faculty of Nursing, Prince of Songkla University, Thailand. Phone: +66833996192, Email: mekar.dwi@gmail.com

Dear participants,

You are appreciated and invited to join in the study entitled "A causal model of breastfeeding duration among Muslim working mothers in Central Java Province, Indonesia." The study is conducted by Mekar Dwi Anggraeni, a Doctoral student in Faculty of Nursing, Prince of Songkla University, Thailand. I am conducting a study to fulfill the requirement of the Doctoral program in nursing under supervision of Assoc. Prof. Dr. Busakorn Punthmatharith, Faculty of Nursing, Prince of Songkla University, Thailand. The purpose of this study is to develop and test a causal model of breastfeeding duration among Muslim working mothers in Central Java Province, Indonesia.

The study and its procedure have been approved by the Institutional Review Board (IRB) of Faculty of Nursing, Prince of Songkla University, Thailand. The data will be collected using self-report questionnaires. The data collection procedure has not a harmful risk to you. Your participation in this study is encouraged to better understand the phenomena and provide valuable information to nurses on promoting breastfeeding duration among working mothers, particularly in Indonesia.

The information will be kept confidentiality. Only the researcher and the advisor are eligible to access the data. Your name and other identity will be reported using code and not be showed in the research report. All of the questionnaires will be destroyed after the study finished for five years. You can decide to participate or not participate in this study because your participation in this study is voluntary. You also can withdraw from this study anytime without any negative consequences.

Lastly, please sign in the informed consent if you agree to participate in this study. After sign in the informed consent form, please fill out all of the study's questionnaires and return all of the questionnaires to the researcher. It will take about 90 - 120 minutes for answer all of the questionnaires. During filling out all of these questionnaires, you may be feel tired, hungry, exhaust, in hurry, fussy infant, or other problems. You can decide to continue filling out the questionnaires at your home, your office, or another place. I or the research assistant will come to your home, your office, or another place by appointment. If you have any questions related to this study, please do not be hesitating to contact me by phone number +6281327717444 or by email address mekar.dwi@gmail.com.

Thank you for your cooperation,

Mekar Dwi Anggraeni

For participants,

I was informed regarding to the study details and I agree to participate in this study.

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(Name of Participant)	(Signature of Participant)	Date
---	---	---
(Name of Researcher)	(Signature of Researcher)	Date

Appendix D

Assumptions of Path Analysis Test Results

Figure 6. The Results of Univariate Outliers' Evaluation of Each Variables

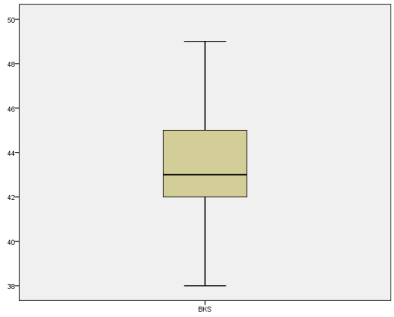
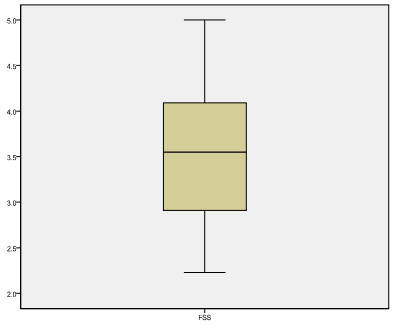
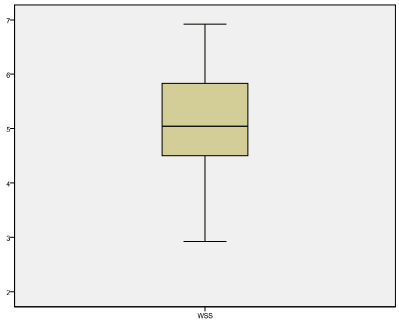
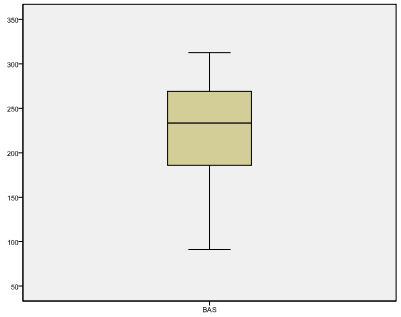
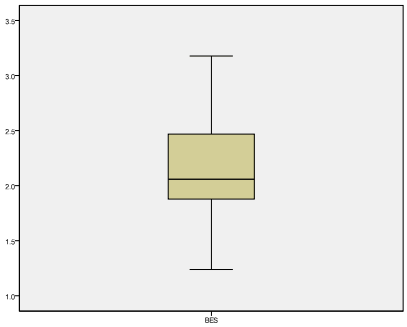
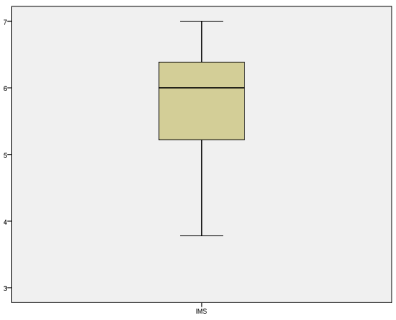
Variables	Boxplot
1. Breastfeeding knowledge	
2. Family support	
3. Workplace support	
4. Attitude toward breastfeeding	
5. Breastfeeding problems	
6. Sufficient milk supply	

Figure 6 (*Continued*)

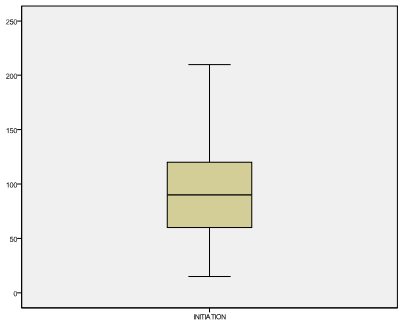
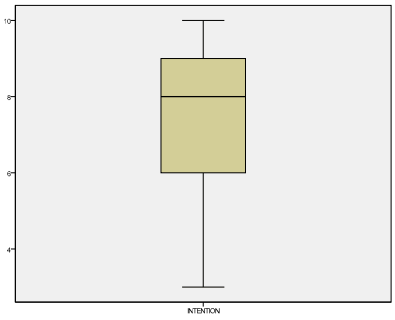
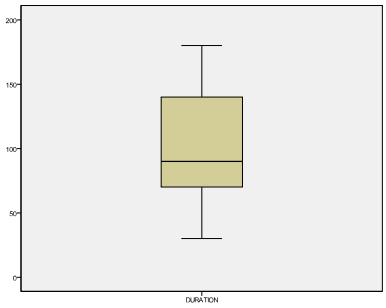
Variables	Boxplot
7. Breastfeeding initiation	8. Intention to exclusive breastfeeding
	
9. Breastfeeding duration	
	

Figure 7. The Results of Univariate Linearity Evaluation

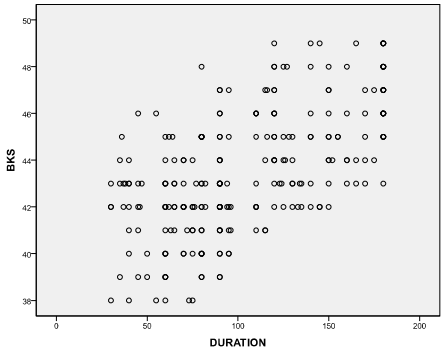
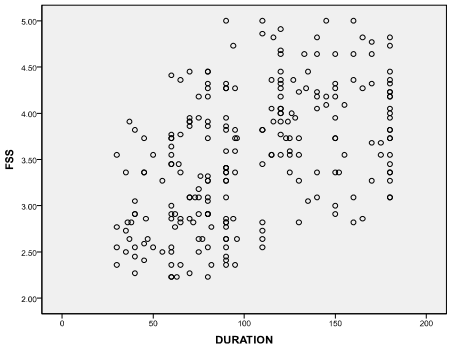
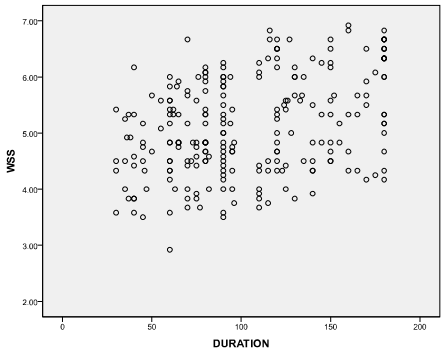
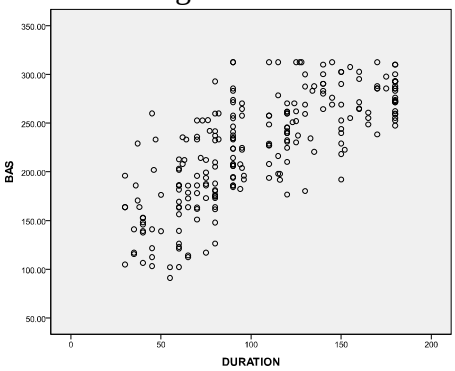
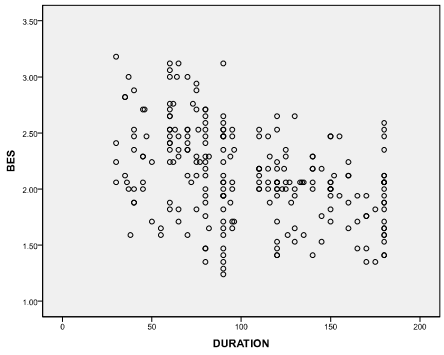
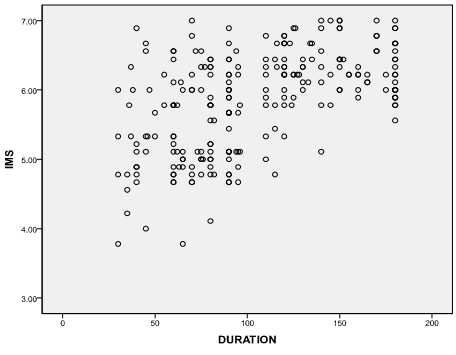
Variable	Scatterplot
1. Breastfeeding knowledge and breastfeeding duration	
2. Family support and breastfeeding duration	
3. Workplace support and breastfeeding duration	
4. Attitude toward breastfeeding and breastfeeding duration	
5. Breastfeeding problems and breastfeeding duration	
6. Sufficient milk supply and breastfeeding duration	

Figure 7 (*Continued*)

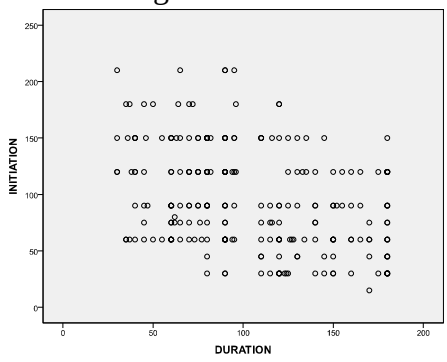
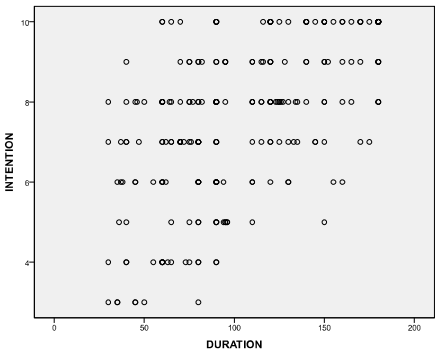
Variables	Scatterplot
7. Breastfeeding initiation and breastfeeding duration	
8. Intention to exclusive breastfeeding and breastfeeding duration	

Figure 8. The Results of Homoscedasticity Evaluation

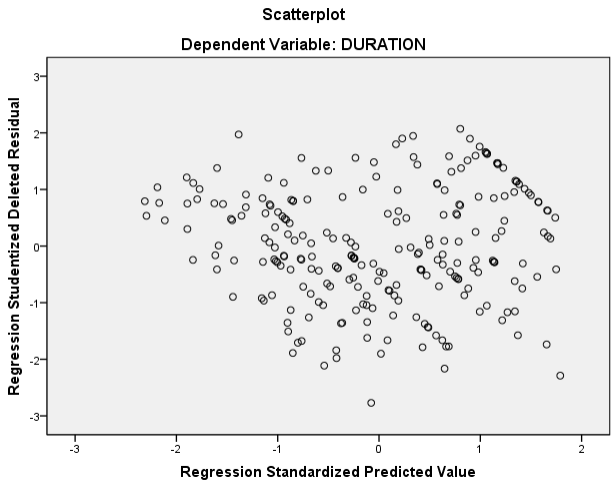


Table 7

The Tolerance Values and the Variance Inflation Factor Values

Variables	Tolerance	VIF
Breastfeeding knowledge	0.614	1.629
Family support	0.744	1.345
Workplace support	0.798	1.254
Attitude towards breastfeeding	0.674	1.484
Breastfeeding problems	0.807	1.239
Sufficient milk supply	0.700	1.428
Breastfeeding initiation	0.870	1.150
Intention to exclusive breastfeeding	0.672	1.488

Table 8

The Correlation Matrix among Dependent Variables

Variables	BK	FS	WS	ATB	BP	SMS	BI	IEB	BD
BK	1								
FS	.414**	1							
WS	.307**	.317**	1						
ATB	.413**	.335**	.245**	1					
BP	-.258**	-.238**	-.327**	-.275**	1				
SMS	.342**	.332**	.249**	.438**	-.332**	1			
BI	-.216**	-.151*	-.175*	-.312**	.071	-.184**	1		
IEB	.510**	.272**	.164*	.391**	-.149*	.319**	-.279**	1	
BD	.597**	.489**	.378**	.741**	-.398**	.527**	-.352**	.576**	1

Note. * Correlation is significant at the 0.05 level (2 tailed)
** Correlation is significant at the 0.01 level (2 tailed)
BK = Breastfeeding knowledge, FS = Family support, WS = Workplace support, ATB = Attitude towards breastfeeding, BP = Breastfeeding problems, SMS = Sufficient milk supply, BI = Breastfeeding initiation, IEB = Intention to exclusive breastfeeding, BD = Breastfeeding duration

Figure 9. The Results of Multivariate Normality Evaluation

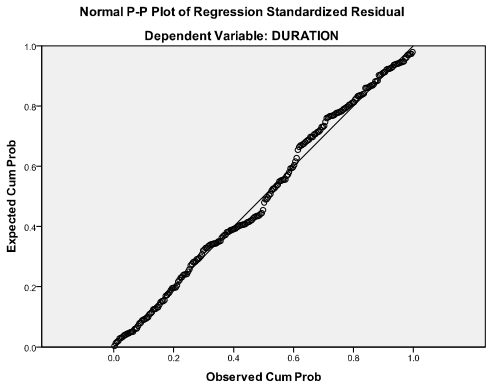
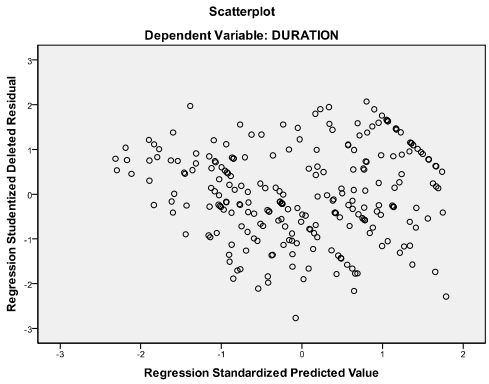


Figure 10. The Results of Multivariate Linearity Evaluation



APPENDIX E

List of Expert Participants

This study involved five experts to evaluate the content validity of modified and new developed research instruments, as follows.

1. Assoc. Prof. Dr. Waricha Janjindamai
   Department of Pediatric, Faculty of Medicine, Prince of Songkla University, Thailand
2. Assist. Prof. Dr. Sopen Chunuan
   Department of Obstetric-Gynecologic and Midwifery, Faculty of Nursing, Prince of Songkla University, Thailand
3. Assoc. Prof. Dr. Yaowares Somsap
   Department of Obstetric-Gynecologic and Midwifery, Faculty of Nursing, Prince of Songkla University, Thailand
4. Dr. Setyowati
   Department of Maternity Nursing, Faculty of Nursing, University of Indonesia, Indonesia
5. Dr. Yati Afiyanti
   Department of Maternity Nursing, Faculty of Nursing, University of Indonesia, Indonesia

VITAE

Name Mekar Dwi Anggraeni

Student ID 5410430011

Educational Attainment

Degree	Name of Institution	Year of Graduation
Bachelor's Degree of Nursing Science (BSN)	Nursing Department, Faculty of Medicine, Gadjah Mada University, Jogjakarta, Indonesia	2005
Master's degree of Nursing Science	Faculty of Nursing University of Indonesia, Jakarta, Indonesia	2009

Scholarship Awards during Enrolment

Project	Granting Agency	Year
Directorate General of Higher Education	Ministry of National Education Republic of Indonesia	2011-2014

Work Position and Address

Nurse Lecturer, Nursing Department, Faculty of Health Sciences, Jenderal Soedirman University

Jl. Dr.Soeparno, Karang Wangkal, Purwokerto Utara, Jawa Tengah, Indonesia

Mobile: +6281327717444

Email: mekar.dwi@gmail.com

List of Published Paper and Proceeding

Anggraeni, M. D., Punthmatharith, B., & Petpichetchian, W. (2013). The proposed causal model of EBF practice among Muslim mothers. *Songklanagarind Journal of Nursing*, *34,* 138-148

Anggraeni, M. D., & Punthmatharith, B. (2014). The use of causal model as a research design in breastfeeding studies: A literature review. Oral presentation at the *7th East Asian Forum of Nursing Scholars*. Philippines