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Maternal Attitudes related to Infant Feeding and Breastfeeding Behaviors in Taiwan

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Maternal Attitudes Related to Infant Feeding and Breastfeeding Behaviors in Taiwan

A dissertation project submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University

by

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Overview of the Research Process

With the consultation and approval of my dissertation committee, a publication style dissertation option was selected for the dissertation project. This option includes two manuscripts that are ready for journal submission and a detailed IRB application. The first manuscript, entitled: Breastfeeding Assessment Tools Designed to Measure Modifiable Maternal Variables: A Review of Psychometric Properties has been recently accepted for publication by the *Journal of Obstetric, Gynecologic & Neonatal Nursing (JOGNN).* The purpose of this systematic review was to compare and contrast the clinical usefulness and psychometric properties of existing self-report instruments. These pen and paper tools address modifiable variables related to breastfeeding duration by assessing breastfeeding attitudes, experience, satisfaction, and confidence that can be used to predict initiation and duration of breastfeeding. Choosing the right tool is essential to achieving the intended outcomes and for providing appropriate interventions and program planning for prolonging breastfeeding duration.

The second manuscript, entitled: Maternal Attitudes related to infant feeding and Breastfeeding Behaviors in Taiwan, is consistent with the manuscript guidelines for the *International Journal of Nursing Studies* (the intended journal for submission). The government in Taiwan has promoted breastfeeding in recent years but the initiation rate and exclusive continuation of breastfeeding are still low. Maternal attitudes have been found to be better predictors of infant feeding method during the postpartum period than are socio-demographic factors. The purpose of this study was to assess maternal attitudes about breastfeeding and examine duration of breastfeeding during the first 6 weeks postpartum. For this study, the Iowa Infant Feeding Attitude Scale (IIFAS) was translated into Chinese, and thus assessing the

psychometric properties of the translated tool was the second aim of the study. The results indicated that the Cronbach's alpha of the IIFAS was 0.73. In-hospital IIFAS scores significantly predicted infant feeding methods at six weeks postpartum. Also, maternal breastfeeding attitudes were the only predictive factor of the breastfeeding duration.

Appendix A is the Institutional Review Board Submission and Approval that indicated the study plan of "Maternal Attitudes Related to Infant Feeding and Breastfeeding Behaviors in Taiwan" submitted to the IRB and an approval letter obtained from the Institutional Review Board.

Breastfeeding Assessment Tools Designed to Measure Modifiable Maternal Variables: A Review of Psychometric Properties

Yen-Ju Ho

Jacqueline M. McGrath

Abstract

Objective: To compare and contrast the clinical usefulness and psychometric properties of existing self-report instruments designed to assess maternal breastfeeding attitudes, experience, satisfaction, and confidence.

Data Sources: CINAHL, PsycINFO, MEDLINE, PubMed databases from 1990 through 2009, and reference lists from selected articles were included in the search. Only published research articles written in English that provided reliability and validity of the self-report instruments for breastfeeding assessment were reviewed.

Study Selection: A total of 301 articles were retrieved according to the initial selection criteria; 24 articles met the final inclusion criteria.

Data Extraction: Data extracted from research studies addressing the purpose of the review and demonstrating psychometric properties were presented.

Data Synthesis: Seven breastfeeding assessment tools were identified, and each tool demonstrated acceptable reliability and validity.

Conclusion: Seven self-report instruments were found to be valid, reliable, and feasible measures for assessing breastfeeding relationships. Yet, two of the seven self-report instruments were only tested in one study, and only one study used a self-report instrument (the breastfeeding attrition prediction tool - BAPT) to test the effectiveness of an intervention. It is recommended that researchers consider using the existing self-report instruments in future experimental studies to test the feasibility and effectiveness of breastfeeding interventions. Moreover, it is important to continue to conduct more well-designed research to further test and refine these self-report instruments in a variety of diverse populations and ethnic groups and to further examine their psychometric properties. Clinical applications have not been well addressed and need to be considered in the design of these future works. Understanding how to

best support the breastfeeding mother must be the long term outcome of instrument development in this area.

Key words: breastfeeding, attitudes, confidence, satisfaction, psychometric properties

Callout 1: Insert at about line 38

Accurate and appropriate assessments that lead to effective interventions are essential for increasing the number of women who initiate and continue to exclusively breastfeed.

Callout 2: Insert at about line 235

Seven self-report breastfeeding assessment instruments have been designed to assess women's attitudes, experiences, satisfaction, and confidence, providing health professionals with a greater understanding of many variables affecting breastfeeding success.

Callout 3: Insert at about line 329

Research is needed to test the tools with racially and ethnically diverse samples to further evaluate the generalizability of their psychometric properties.

Exclusive breastfeeding provides optimal nutrition for infants in the first six months of life, and breastfeeding with complementary foods for at least twelve months is the ideal feeding pattern for optimal infant health. Moreover, breastfeeding is being advocated as a public health strategy for improving infant and child health survival, improving maternal morbidity, and controlling health care costs (American Dietetic Association, 2005). The breastfeeding goals within Healthy People 2010 include a breastfeeding initiation rate of 75% and a six month breastfeeding rate of 50% (U. S. Department of Health and Human Services, 2000). Recent statistics show that the breastfeeding initiation rate for the early postpartum period in the United States is 74%, which is approaching the Healthy People 2010 goal; however, breastfeeding rates are only 43.4% at six months. Rates for exclusive breastfeeding through ages three months and six months are 33.1% and 13.6 % respectively, well below targets set by Healthy People 2010 (Centers for Disease Control and Prevent (CDC), 2009). Breastfeeding goals for Healthy People 2020 are still under development but will likely be consistent with those for 2010.

Many known predictors for mothers at risk for discontinuing breastfeeding prematurely are non-modifiable demographic variables, such as maternal age, marital status, educational level, and socioeconomic status. In general, older, better educated, married and /or high-income women are most likely to breastfeed for a longer period of time (Scott, & Binns, 1999; Thulier, & Mercer, 2009). The possible modifiable variables related to breastfeeding outcomes include breastfeeding attitudes, experience, satisfaction, and breastfeeding confidence. Accurate and appropriate assessment and effective interventions are essential elements in increasing the number of women who plan to initiate and continue to breastfeed. For health professionals to truly address the short duration of breastfeeding, they need to identify high-risk mothers based on modifiable variables that may guide the development and evaluation of supportive interventions (Blyth et al., 2004; Dennis, & Faux, 1999; Dennis, 2002;

Janke, 1994). As a result, many self-report assessment tools have been developed to increase the ability of health professionals to determine maternal attitudes, experience, satisfaction, and confidence associated with the breastfeeding behavior. These self-report tools focus on different aspects of breastfeeding that are associated with the potentially modifiable variables.

However, assessing the reliability and validity of these self-report tools is essential for health professionals who must choose the most appropriate tool to apply in clinical settings or for research. Thus, the purpose of this systematic review is to compare and contrast the clinical usefulness and psychometric properties of existing self-report tools in assessing breastfeeding attitudes, experience, satisfaction, and confidence that can be used to predict initiation and duration of breastfeeding. Choosing the right tool is essential to achieving the intended outcomes and for providing appropriate interventions and program planning for prolonging breastfeeding duration.

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Methods

Several databases were searched, including CINAHL, PsycINFO, MEDLINE, and PubMed, using the following keywords: breastfeeding, scale, tool, measure, and nursing. The keywords were used one by one for searching the articles, and then in combination. A total of 301 articles were retrieved and evaluated from the databases and reviewed. For this review, only articles that reported modifiable maternal psychosocial variables including maternal attitudes, experience, satisfaction, and confidence toward breastfeeding, described the methodological process used to determine the reliability and/or validity of a self-report tool to predict or explore the outcome of breastfeeding, and were published in English between years 1990 and 2009 were included. The review was limited to 1990 through 2009 because we believed this would provide tools relevant for current practice. Moreover, the articles included in this review that examine both the reliability and validity of the self-report tool are (1) the original study

that indicated how the self-report tool was developed and (2) studies presenting how the self-report tool was used in different settings or populations and/or translation of the self-report tool into different languages. Only research articles reporting the reliability of the self-report tools within their findings were included. Unpublished doctoral dissertation and reports were not included in the search. During the initial selection process, only 17 articles met the inclusion criteria. Of the 284 articles excluded, 179 were not research studies and represented summaries, reviews or reports; 68 were research studies however, psychometric properties for the self-report tools used in the research were not reported. Ten of these 68 articles used self-report tools included in this review; however, they did not report the psychometric properties. The other 58 articles used untested researcher developed self-report tools for their study and did not provide any information about the reliability and validity of those self-report tools. Additionally, we found 24 qualitative research articles and 13 qualitative reviews none of which were included in this review.

After the initial screening process, the reference lists of those 17 articles were then searched for additional articles related to the identified self-report tools, which also reported the reliability and/or validity of the self-report tools. Eight more articles were found and included in the review based on this strategy for a total of 25 research articles. A diagram of the decision-making for the review process is provided in Figure 1. This comprehensive review was conducted to examine evidence regarding the psychometric properties of the identified self-report breastfeeding assessment tools. This information will be helpful to those trying to identify tools for use in future research or translational implementation projects in the clinical setting.

----------Insert Figure 1 about here----------

Results

Our search identified a total of seven self-report breastfeeding assessment tools that

assessed breastfeeding attitudes, experience, satisfaction, and confidence. These self-report tools were found within 25 research articles that reported the findings as well as psychometric properties of the self-report tools. Reliability was reported in all cases using the Cronbach's alpha. Validity was demonstrated in several different ways, including content, construct, and/or predictive validity. First, a descriptive overview of each self-report tool is provided in Table 1. Then, the psychometric properties of the self-report tools are presented in Table 2 to demonstrate the reliability and validity of the self-report tools.

The Gender-Role Attitudes toward Breastfeeding Scale (GRABS) was originally developed by Kelley, Kviz, Richman, Kim, and Short (1993) to measure gender-role attitudes about breastfeeding in primiparous women. This self-report tool has acceptable reliability and validity and was initially tested in a sample of new mothers. The advantage of this self-report tool is that it is easy to administer because it consists of only 6 items. However, only the initial tool development study of the GRABS reported the reliability and validity of the tool. No other studies have used this self-report tool since the development, and thus assessment of generalizability is difficult.

The Iowa Infant Feeding Attitudes Scale (IIFAS) was developed by De La Mora and Russell (1999) to measure attitudes toward infant feeding and to identify factors that influence women's decisions related to infant feeding methods. Six studies that utilized the IIFAS and included a description of the psychometric characteristics were found. The IIFAS has been also translated into Romanian. Adequate content, construct and predictive validity of IIFAS were examined in one study (De La Mora, & Russell, 1999). De La Mora and Russell tested the IIFAS in three different studies to evaluate the construct and predictive validity. They examined the relationship between maternal attitudes and intended feeding behavior in studies 1 and 2, and the tool was found to be highly reliable. Then, they conducted a third study examining the relationship between attitudes and the duration of breastfeeding. The

Cronbach's alpha coefficient was only 0.68 indicating less internal consistency among the items than in the previous studies. Overall, this self-report tool has acceptable reliability and validity and has been tested with a variety of populations including prenatal women, postpartum women, formula feeding women, breastfeeding women, low-income pregnant women, fathers, and health visitors. The main advantage of this self-report tool is its simplicity and ease of use. In addition, the wording of items makes it possible to use the self-report tool with a variety of groups, such as students, fathers, and adolescents.

The Maternal Breastfeeding Evaluation Scale (MBFES) was originally developed by Leff, Jefferis, and Gagne (1994) to measure important aspects of breastfeeding that mothers identified as essential to success. Adequate predictive validity was examined in two studies (Leff et al., 1994, & Riordan, Woodley, & Heaton, 1994). Leff et al. (1994) also reported on the construct and content validity. Exploratory factor analysis was used to assess the construct validity (Leff et al. 1994). The MBFES has also demonstrated good predictive validity. Overall, this self-report tool has acceptable reliability and validity when used with postpartum women. The advantage of this self-report tool is that it is helpful in identifying mothers' satisfaction with breastfeeding; it also provides insight into important aspects of the process by examining dimensions of both mother and infant variables.

The Breastfeeding Self-Efficacy Scale (BSES) was originally developed by Dennis and Faux (1999) to measure new mothers' breastfeeding self-efficacy, that is, the mothers' perceived ability to perform breastfeeding. Bandura's (1977) social learning theory was used as a framework for the development of this self-report tool. The BSES has been translated into Spanish and Chinese. This self-report tool has been used in several studies. However, after the original research, Dennis (2003) reworked the original BSES into BSES-Short Form (BSES-SF) because the results of internal consistency and multiple factor loadings suggested a need to reduce the items. Three other research studies were found describing the psychometric

characteristics of the BSEF-SF.

Dennis and Faux (1999) reported adequate content validity of the BSES in their original study. Construct validity was tested by exploratory factor analysis in each of four studies (Creedy et al., 2003; Dennis, & Faux, 1999; Dai, & Dennis, 2003; Torres, Davila Torres, Parrilla, Rodriguez, & Dennis, 2003). Construct validity was also tested by comparison of contrasted groups in three of these studies (Creedy et al., 2003; Dennis, & Faux, 1999; Torres et al., 2003). Additionally, the BSES was tested by correlations with measures of theoretically related constructs in three of these studies (Creedy et al., 2003; Dennis, & Faux, 1999; Dai, & Dennis, 2003). Based on the theory of self-efficacy, it was hypothesized that women with previous breastfeeding experience would have had higher breastfeeding self-efficacy than women who had no breastfeeding experience (Dennis, & Faux, 1999). As a result, the comparison of contrasted groups indicated that there was a significant difference in BSES scores among primiparas and multiparas with previous breastfeeding experience (Creedy et al., 2003; Dennis, & Faux, 1999); there were also significant differences in the antenatal breastfeeding scores when the mother had previous breastfeeding experiences ($p=0.02$) (Torres et al., 2003).

Dennis and Faux (1999) proposed examining the construct validity of the BSES through simultaneous exploration of the self-report tool with other measures of breastfeeding self-efficacy or theoretically related concepts. However, because no other known measures of breastfeeding self-efficacy were found, these researchers hypothesized that the BSES would be positively associated with the questionnaire measure of individual differences in achieving tendency (QMIDAT) and general self-efficacy scale (GSES). The QMIDAT developed by Mehrabian and Bank (1978) to measure achievement motivation, and the GSES is an instrument developed by Sherer et al. (1982) to measure the individual's broad sense of confidence across different situations that have developed from past success and failure

experiences. The results indicated that the BSES was positively related to the measures of achievement tendency motivation (QMIDAT) ($p<0.001$) but negatively related to the general self-efficacy ($p=0.03$) (GSES) (Dennis, & Faux, 1999). Moreover, Creedy et al. (2003) found that the BSES was positively correlated with a maternal confidence/commitment subscale of the H&H lactation scale (HHLS) ($p<0.01$). The H & H Lactation Scale developed by Hill and Humenick (1996) is a self-report tool designed to evaluate maternal perceptions of insufficient milk supply. The BSES was found to be negatively correlated with the Edinburgh postnatal depression scale (EPDS) at four weeks postpartum ($p<0.001$) and eight weeks postpartum ($p=0.04$) (Dai, & Dennis, 2003). Additionally, women who have depressive symptoms at seven weeks postpartum could be predicted to have a reduced preference for breastfeeding (Galler, Harrison, Biggs, Ramsey, & Forde, 1999). Moreover, the BSES scores have also demonstrated good predictive validity for breastfeeding self-efficacy.

Dennis (2003) refined the breastfeeding self-efficacy scale (BSES) to the breastfeeding self-efficacy scale-short form (BSES-SF). Adequate construct and predictive validity were noted in three studies. Dennis (2003) assessed the construct validity using factor analysis, comparison of contrasted groups, and correlations with measures of similar constructs. The comparison of contrasted groups indicated that there was a significant difference in BSES-SF scores between primiparas and multiparas with previous breastfeeding experience at one week ($p<0.001$), four weeks ($p=0.02$) and eight weeks ($p=0.05$). They also found that the BSES-SF was positively correlated with self-esteem and negatively with measures of maternal mood and perceived stress (all were $p<0.001$). Wutke and Dennis (2006) assessed construct validity and found that women with previous breastfeeding experience had significantly higher BSES-SF scores than women with no previous breastfeeding experience ($p=0.002$); and multiparous women had significantly higher BSES-SF than primiparous women ($p=0.018$). Gregory, Penrose, Morrison, Dennis, and MacArthur (2008) compared two contrasting groups to assess

construct validity and found that there was a significant difference in in-hospital BSES-SF scores between primiparas and multiparas with previous breastfeeding experience (p=0.001). McCarter-Spaulding and Dennis (2010) indicated that women with previous breastfeeding experience had significantly higher mean in-hospital BSES-SF scores than those with no previous breastfeeding experience (P<0.001), and network support for breastfeeding was significantly associated with BSES-SF scores at the first postpartum week (p<0.001) and one month postpartum (p<0.001). The BSES-SF was also found to have good predictive validity.

Overall, the BSES and BSES-SF both have acceptable reliability and validity and have been tested with a variety of populations, including hospitalized breastfeeding women, antenatal women, and postnatal breastfeeding women. The advantages of these two self-report tools are that they assess the unique needs of new breastfeeding mothers, identify areas of focus for nursing interventions and practice, as well as promote specific approaches to increase breastfeeding rates. It would seem that since the BSES-SF has fewer items it would be easier to use in the clinical setting; although more research is needed to confirm that belief.

The Breastfeeding Personal Efficacy Beliefs Inventory (BPEBI) was originally developed by Cleveland and McCrone (2005) to measure women's confidence in initiation and duration of breastfeeding in the first postpartum year. They also reported content and construct validity. The construct validity was supported by performing a stepwise multiple regression in which the BPEBI was a significant predictor of duration of exclusive breastfeeding during the early weeks after birth (p<0.00). The combined predictive effects of number of children, personal efficacy beliefs, and current pregnancy explained 46% of the variance, while BPEBI scores explained 4% of the variance. Reliability and validity are also acceptable for this self-report tool. The advantage of this self-report tool is that it assesses women's self-efficacy beliefs about breastfeeding during the early weeks after birth, thus helping health professionals to better understand women's confidence related to successful breastfeeding behaviors. Yet, the

BPEBI was tested in only one study by Cleveland and McCrone (2005), and the sample was university students. This self-report tool needs to be further tested with women who have different breastfeeding experiences and ethnic backgrounds to support the continued use of the BPEBI in research and clinical practice.

The Breastfeeding Attrition Prediction Tool (BAPT) was initially developed by Janke (1992) to identify women who have a tendency to wean their infants relatively early. This self-report tool is based on the Theory of Planned Behavior as a means to measures maternal attitudes, perceived control, and subjective norms toward breastfeeding. Janke (1994) revised the initial BAPT based on the result of the initial factor analysis in the pilot study. Researchers have subsequently used the revised BAPT.

The BAPT has been tested in a variety of populations. Five studies in which the psychometric properties of the BAPT were described were found. Dick et al. (2002) conducted a study to test the reliability and validity of the BAPT in women intending to breastfeeding at least eight weeks postpartum. They used the original BAPT developed by Janke (1992) in their study, but after factor analysis, they deleted several items to increase the factor loadings. Their modified BAPT has 42 items and uses a 5-point Likert type scale instead of 6-point Likert type scale. Reliabilities of Janke's original scoring and modified scoring were compared by using first time breast-feeders (n=156) in the study, and the results indicated that scoring methods of the original and modified BAPT had acceptable Cronbach's alpha coefficients. So Dick et al. (2002) replaced the original scoring with the modified scoring.

Evans, Dick, Lewallen, and Jeffrey (2004) used the modified BAPT tool for their study to further test the psychometric properties of the modified BAPT in first- time mothers intending to breastfeed through at least eight weeks postpartum. They also examined the effectiveness of the modified BAPT given in the prenatal breastfeeding class and in the first two days postpartum in predicting cessation of breastfeeding. Mothers completed the first

administration of BAPT when they were in the last trimester and completed the second BAPT during their hospital stay. Adequate construct and predictive validity of the BAPT were examined in three studies (Janke, 1992; Janke, 1994; Dick et al., 2002). Overall, the BAPT has acceptable reliability and validity and has been tested in low income pregnant women and women who planned to breastfeed for at least 6-8 weeks. The advantages of this self-report tool are that it can be used to identify women who have a high potential to stop breastfeeding in the early postpartum period based on the theory of planned behavior, which is composed of three constructs: attitude, subjective norm, and control. Since the self-report tool is long (42 items), future efforts should be geared toward shortening the self-report tool without change its reliability and validity in several different populations.

----------Insert Table 1 here----------

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Discussion

During this review we found that a variety of self-report questionnaires are being used to assess women's attitudes, experiences, satisfaction, and confidence toward breastfeeding. Each of these self-report tools contributes to our greater understanding of the breastfeeding experience in different ways. In this discussion, these self-report tools are compared and contrasted. A brief description of the function of these self-report tools and the results of the research studies using these self-report tools is provided to further reveal the differences and similarities among the tools. Finally, the reviewers examine the potential clinical relevance of these self-report tools to facilitate the decision-making process of practitioners and researchers alike.

The Gender-Role Attitudes toward Breastfeeding Scale (GRABS) is useful for identifying new mothers' behaviors toward breastfeeding. Developed for clinical use, the GRABS has

demonstrated the ability to predict the initiation and continuation of breastfeeding behavior among new mothers. Also, GRABS could be useful in identifying the preferences of new mothers and facilitate increased understanding of the effects of competing and demanding roles on breastfeeding. Increased use in a variety of populations is needed.

The IIFAS can be used to predict the choice of infant feeding methods and actual feeding behaviors as reflected by measures of behavioral intentions and the duration of breastfeeding. The self-report tool includes both knowledge and attitude items and has been used in America, Scotland, Northern Ireland, and Romania. De La Mora and Russell noted that one possible explanation for the lower level of reliability for the IIFAS in study 3 was that in studies 1 and 2 the attitude scores were between women who may or may not have ultimately chosen to breastfeed compared to the sample of only breastfeeding women who participated in study 3. The differences in the sample characteristics appear to account for the variability of attitude scores among these studies. Women had much more positive attitudes toward breastfeeding in study 3 (M=66) than did women who participated in studies 1 and 2 (M=59) ($p<0.001$); however, these women had already elected to at least initiate breastfeeding, which may account for the differences in variability. The scores on the IIFAS of women in the first two studies varied more (SD=11) than the scores of women in study 3 (SD=7) ($p<0.001$) because the first two studies included women who intended to both breast and formula feed their babies. The reduced variability of scores on the IIFAS in study 3 may have limited the correlations among the items, thus reducing the level of Cronbach's alpha coefficient. Moreover, the initial sample across these three studies (De La Mora & Russell, 1999) was well-educated Caucasian women, so there is a need to test this self-report tool in more diverse samples to understand the relationship between the demographic variables and breastfeeding attitudes.

Wallis et al. (2008) translated the English version of IIFAS to a Romanian version and reported a weaker reliability in the antenatal group ($\alpha=0.50$), with an improved Cronbach's

alpha in the subgroup of antenatal multigravid (α=0.60) and in university-educated women (α=0.57). They indicated that primigravid, less educated antenatal Romanian women may reflect their lack of information about infant feeding and consideration of infant feeding issues during their pregnancy. Developed for clinical use, the IIFAS has demonstrated the ability to predict infant feeding method and support the relationship between attitudes and the duration of breastfeeding among women who plan to breastfeed during their hospital stay.

The MBFES has been used to differentiate breastfeeding duration among women who plan to breastfeed. However, this self-report tool was developed and tested in a sample of middle class, married, white, and well educated women. Further testing in samples of different demographic backgrounds and ethnic groups to demonstrate its external validity is needed. Developed for clinical use, the MBFES has demonstrated the ability to identify satisfaction with breastfeeding in the postpartum period and provides information for health professionals to design interventions to promote successful breastfeeding.

The BSES has been translated into Chinese (Dai & Dennis, 2003) as well as Spanish (Torres et al., 2003), and has been tested in Australia (Creedy et al., 2003). Dennis (2003) shortened the BSES to become the BSES-SF, making the BSES easier to administer and score. The BSES-SF has been translated into Polish (Wutke & Dennis, 2006), and has been tested in the UK (Gregory et al., 2008). Both the BSES and BSES-SF could be administered to either prenatal or postpartum women. The BSES and BSES-SF are excellent tools to identify mothers with low confidence who are at a high risk to discontinue breastfeeding. Developed for clinical use, the BSES and BSES-SF demonstrated potential as a predictor of early breastfeeding cessation related to mothers' confidence, thus resulting in increased or decreased lengths of breastfeeding time. Health professionals can use the self-report tools to choose interventions to facilitate individual confidence building strategies, which could ultimately increase breastfeeding duration.

The BPEBI assessed long term confidence toward breastfeeding, which is different from the BSES and BSES-SF developed by Dennis in 1999 and 2003 that assessed short term confidence. While the BPEBI assesses women's confidence about their capability to breastfeed for three months, six months, and one year, and their capability to breastfeed in a variety of environments, the BSES and the BSES-SF assess the women's initial confidence toward breastfeeding up to six weeks after giving birth. Women's confidence is measured through their capability to manage the initial breastfeeding techniques and challenges. Developed for clinical use, the BPEBI has demonstrated its potential for assessing breastfeeding confidence and predicting duration of breastfeeding in the first year postpartum. It is a useful self-report tool for health professionals to understand of women's confidence about managing duration, their techniques, motivation, the influence of different environments, and possible challenges related to breastfeeding.

The BAPT demonstrated that maternal attitudes regarding breastfeeding and formula feeding, professional support, and control over barriers to breastfeeding are essential variables associated with early breastfeeding attrition (Janke, 1994). Yet, Evans et al. (2004) found that the BAPT was not effective in predicting women who might wean prematurely, either with the prenatal or postnatal administration of the tool. These findings indicate that changes in maternal attitudes toward breastfeeding during the last trimester and the early postpartum period were not as significant. That is, maternal attitudes were stable by the third trimester. On the other hand, it is well known that women are more likely to make the decision about how they will feed their infants early, sometimes before they are pregnant. Another study, conducted by Dick et al. (2002), found that the BAPT failed to predict breastfeeding status in women who had previously breastfed. Also, some researchers have noted that the BAPT is not easy to administer and score. Suggestions have been made to decrease the number of items without diminishing the reliability and validity of the self-report tool. This self-report tool also needs to

be tested in culturally diverse populations to increase its clinical utility and validity. Additionally, the BAPT needs to be further tested with larger samples of first-time breastfeeding women. Developed for clinical use, the BAPT has demonstrated the ability to identify women at high risk for early breastfeeding attrition. Also, health professionals could use the BAPT to design interventions that address the three main aspects of behavioral change: attitudes, subjective norms, and perceived control to improve breastfeeding duration.

----------Insert callout 3 here ----------

Conclusion

When considering application of self-report breastfeeding assessment tools in research or the clinical setting, using self-report tools that have been tested for reliability and validity is essential. Clinicians or researchers should be aware that modifying tools or testing tools in a different population may alter the psychometric properties, and testing is required to further confirm reliability and validity. Also, ease of use in administration and scoring is important to the practitioner. From this review, the Cronbach's alpha coefficient was acceptable for each of these self-report tools demonstrating acceptable reliability. Construct, content, and predictive validities conducted supporting the validity of self-report tools. Yet, two of the seven self-report tools (GRABS and BPEBI) were described in only one study, and further research is needed to confirm the psychometric properties. Only one study used a self-report breastfeeding assessment tool (BAPT) to test the effectiveness of an intervention (Ryser, 2004). Further studies are needed to examine breastfeeding intervention strategies and protocols that are addressed by the components within the tools.

Overall, these tools demonstrate valid, reliable, and feasible self-report measures of attitudes, satisfaction, experiences, or confidence toward breastfeeding. Most of the studies in this review were conducted in the US, and the samples were almost all Caucasian, well educated, and middle class. Research to establish greater predictive validity should be based on

follow-up assessments with diverse demographic samples and across diverse cultures in the postpartum period. Moreover, researchers have made efforts to develop a variety of self-report tools to identify women at risk for breastfeeding cessation. Interventions with women identified at risk with these self-report tools are another important area of study. In the future, it is important to conduct well-designed studies that include large, representative samples to examine these self-report tools and improve their external validity for use in research and clinical practice.

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Figure 1: Decision-Making used during Review Process

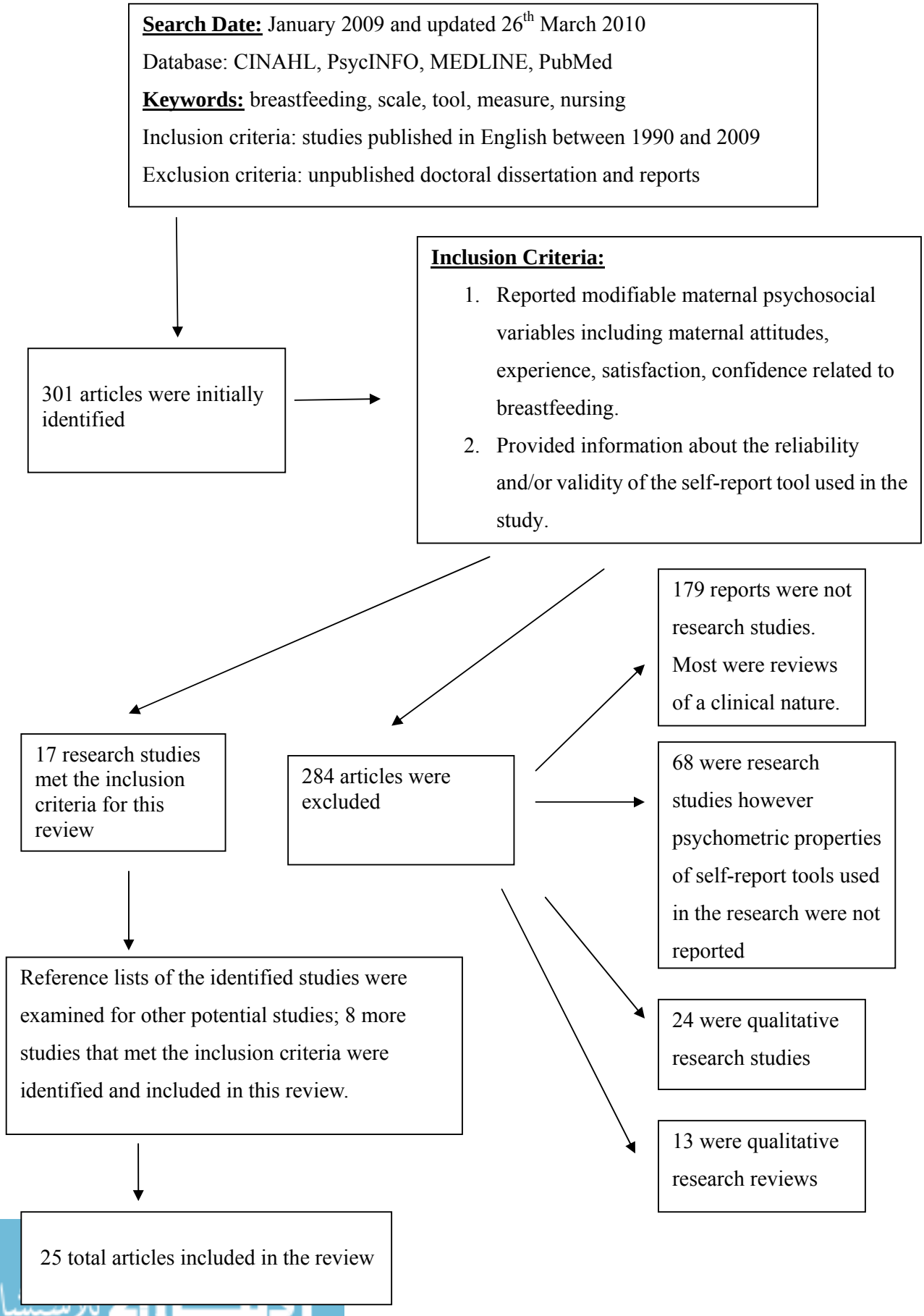

Table 1: Descriptions of the maternal breastfeeding Assessment Tools

Tool	**Numbers of items**	**Meaning of score**	**Subscales**
GRABS (Kelley et al., 1993)	6 items 5-point Likert scale format.	A high score reflects a more positive breastfeeding attitude.	--
IIFAS (De La Mora & Russel, 1999)	17 items 5-point Likert scale format; nine of the items are reverse-scored.	A higher score reflects a more positive attitude toward breastfeeding.	--
MBFES (Leff et al, 1994)	30 items 5-point Likert scale format.	Higher scores reflect more positive breastfeeding experiences.	Maternal enjoyment/Role attainment; Infant satisfaction/Growth; Lifestyle/Maternal body image.
BSES (Dennis & Faux, 1999)	33 items 5-point Likert scale format.	Higher scores indicate a higher level of breastfeeding self-efficacy.	Technique; Intrapersonal thoughts.
BSES-SF (Dennis, 2003)	14 items 5-point Likert scale format.	Higher scores reflect higher levels of breastfeeding self-efficacy.	--

BPEBI (Cleveland & McCrone, 2005)	27 items. The range of score is based on how much confidence the women have in breastfeeding as a percentage categorized into three groups of 0%, 50%, and 100% for each item.	Higher percentages reflect higher levels of self-efficacy.	Manage duration; Manage technique with social support; Manage motivation; Manage different environment; Manage possible challenges.
BAPT (Janke, 1992)	44 items 6-point Likert scale format.	Higher scores indicate higher attitudes, subjective norm, and control about breastfeeding.	Negative breastfeeding sentiment; Positive breastfeeding sentiment; Negative formula feeding sentiment; Breastfeeding control; Professional support; Family and friend support.
BAPT (refined) (Janke, 1994)	52 items 6-point Likert scale format.	A higher score reflects a greater attitude, subjective norm, and control toward breastfeeding.	Negative breastfeeding sentiment; Positive breastfeeding sentiment; Social and professional support; Breastfeeding control.

Table 2: Summaries of the validation studies of breastfeeding assessment tools

Tool /Year	**Population tested**	**Reliability**	**Validity**
GRABS / Kelly et al. (1993)	First-time mothers at 8 wks postpartum, including formula feeding and breastfeeding women. n=91 (92% return rate) 83.5% white 35.2% graduate education.	Cronbach's α =0.74 Average corrected item-total correlation =0.47	Findings support construct and convergent validity. Using a confirmatory factor analysis for assessing the structure equation models.
IIFAS / De La Mora & Russell (1999)	Study 1: n=125 97% white; 49% some college education Study 2: n=130 91% white; 40% some college education Study 1 and 2: postpartum women, including formula feeders and breastfeeders within 48 hrs of the births of their infants. Study 3: women who had initiated breastfeeding at hospital and followed up for 16 wks postpartum.	Study 1: Cronbach's α=0.86; corrected item-total correlations: 0.22-0.68 Study2: Cronbach's α=0.85; corrected item-total correlations: 0.23-0.69 Study3: Cronbach's α=0.68 ; corrected item-total correlations: 0.07-0.45	Findings support content, construct, and predictive validity. The scores of IIFAS predicted the duration of both exclusive and partial breastfeeding intention to breastfeed.

	n=763, 96% white; 61% some college education n=725 (95%) at 16 wks follow up.		
IIFAS / Scott et al. (2004)	Pregnant women (gestational age 8-12 wks) with their partners. n=108 couples	Cronbach's α=0.79 (mothers) Cronbach's α=0.77 (fathers)	
IIFAS / Tappin et al. (2006)	Health visitors. n=146 (68% return rate).	Cronbach's α=0.79	
IIFAS / Sittlington et al. (2007)	Pregnant women (gestational age 8-12 wks) n=192 53.1% secondary education, 35.4% college or university education.	Cronbach's α=0.79	
IIFAS / Dungy et al. (2008)	Low-income pregnant women and their social networkers. n=49 pregnant women n=47 social networkers	Cronbach's α=0.74 (mothers) Cronbach's α=0.89 (social networkers)	Findings support predictive validity. The higher IIFAS scores were significantly associated with intention to breastfeed and breastfeeding in hospital.

IIFAS / Wallis et al. (2008)	pregnant women attending the clinic. n=336 mothers within 24 hours of delivery n=276 postpartum women who initiated breastfeeding in the hospital n=52 Antenatal: 52.1% university; 82.8% Romanian, 14.8% Hungarian, 2.4% Roma Maternity: 61.3% university; 84.3% Romanian, 12.3% Hungarian, 3.0% Roma.	Cronbach's α=0.50 (antenatal groups) Cronbach's α=0.63 (maternity groups)	Findings support predictive validity. The higher IIFAS scores were significantly related to intent to continue to breastfeed at six weeks postpartum (p=0.04) and at six months postpartum (p=0.06).
MBFES / Leff et al. (1994)	Women who had breastfed postpartum for a few days. n=442 (72% return rate) All but nine of the subjects: white; median number of years of education: 15 years n=28 retest sample (56% return rate).	Overall Cronbach's α=0.93 Cronbach's α =0.80 - 0.93 for subscales. Test-retest correlations=0.82-0.94 ($p < 0.001$).	Findings support construct, predictive, and content validity. Exploratory factor analysis resulted in three factors and accounted for 38.5 % of the variation. The MBFES was positively correlated to overall

			breastfeeding satisfaction and the duration of breastfeeding ($p<0.001$).
MBFES / Riordan et al. (1994)	Pregnant women who attended breastfeeding classes and intended to breastfeed for at least six wks answer the MBFES at four months postpartum. n=73 (n=75 for 86% return rate but deleted 2 subjects because of non-breastfeeding.) 68% some college preparation, 14% post college education.	Overall Cronbach's α=0.94 Cronbach's α =0.84-0.91	Findings support predictive validity. The MBFES was positively correlated with both intention and duration of breastfeeding ($p=0.01$)
BSES / Dennis & Faux (1999)	In-hospital breastfeeding mothers and follow up at 6weeks n=130 (75% return rate) 92.5% Caucasian; 50% some postsecondary education.	Cronbach's α=0.96 73% of corrected item-total correlations: 0.30-0.70	Findings support content, construct, and predictive validity. Principal components analysis (PCA) with varimax rotation accounted for 51% of the variation and resulted in three factors. The women with a higher BSES score were more likely to

			exclusively breastfeed at six weeks postpartum ($p<0.001$).
BSES / Dai & Dennis (2003)	Hospitalized breastfeeding Chinese women. Follow up at 4 and 8 wks. n=186 (89.6% participation rate) 34%some postsecondary education, 21% university education.	Cronbach's α=0.93	Findings support construct and predictive validity. PCA with varimax rotation accounted for 44.22% of the variation and yielded two factors (Intrapersonal thoughts; Technique). The higher the BSES score was at the initial hospitalization after birth, the more likely the woman was breastfeeding at four and eight weeks postpartum and doing so exclusively ($p<0.001$).
BSES / Creedy et al. (2003)	Antenatal women in Australian intending to breastfeed and breastfeeding women at 1 wk and 4 months postpartum follow up n=300 (90.6% participation rate) n=276 (92% participation rate) at 1wk	Cronbach's α=0.97 (antenatal women) Cronbach's α=0.96 (1 wk postpartum) Cronbach's α=0.96 (4 months postpartum)	Findings support construct and predictive validity. PCA with varimax rotation accounted for 57% of the variation and yielded two

	follow up n=233 (92% participation rate) at 4 months follow up 86% Caucasian, 4% Australian Aboriginal, 4% Asian, 6% other ethnic origin 63% high school, 22% university.		factors (Intrapersonal thoughts; Technique). Women who were predominantly breastfeeding (including exclusive, almost exclusive, and high breastfeeding) at one week and four months postpartum had a higher BSES score than women who were either partially breastfeeding or bottle feeding ($p<0.001$).
BSES / Torres et al. (2003)	Puerto Rican women breastfeeding within 48 hrs of delivery at hospital. n=100 62% baccalaureate education.	Cronbach's $\alpha=0.96$	Findings support construct and predictive validity. PCA with varimax rotation accounted for 53.5% of the variation and yielded two factors (Intrapersonal thoughts; Technique). The women who were

			exclusively breastfeeding had a higher score than women who were breastfeeding with some form of supplementation ($p<0.001$).
BSES-SF / Dennis (2003)	Breastfeeding women. 91% white; 40% college education; 24% university or higher education Antenatal and postnatal breastfeeding women. n=491 (84% participation rate) at 1 wk follow up 91% white; 40% college education; 24% university or higher education n=459 (94% participation rate) at 4 wks follow up n=389 (79.2% participation rate) at 8 wks follow up.	Cronbach's $\alpha=0.94$	Findings support construct and predictive validity. PCA yielded one factor and accounted for 58.35% of the variation. The BSES-SF scores demonstrated significant differences between breastfeeding mothers and bottle feeding mothers at 4 and 8 weeks ($p<0.001$).
BSES-SF / Wutke & Dennis (2006)	Breastfeeding women in Polish. n=105 (83.3% response rate) n=105 follow up at 8 and 16 wks 36.2% secondary education, 58.1% some	Cronbach's $\alpha=0.89$	Findings support construct and predictive validity. In-hospital BSES-SF scores significantly predicted the

	postsecondary education.		duration of breastfeeding and exclusive breastfeeding at 8 and 16 weeks (p=0.001).
BSES-SF/Tokat et al., 2008)	144 pregnant and 150 breastfeeding women in Turkey. 33.3% university education.	Cronbach's α=0.87 for antenatal women Cronbach's α=0.86 for postnatal women	Findings support predictive validity. It indicated that antenatal and postnatal BSES-SF scores of women with previous breastfeeding experience were different from women with no breastfeeding experience.
BSES-SF / Kingston et al., (2007)	Breastfeeding women. n=63 84 % white 95% women had more than high school education	Cronbach's α=0.94	Findings support predictive validity Women who were breastfeeding at 4 weeks postpartum had significantly higher BSES-SF scores at 48 hours postpartum than women who bottle feed their infants (p=0.003).
BSES-SF / Gregory et al. (2008)	In-hospital breastfeeding mothers. n=165 n=124 (75% return rate) at 4 wks follow	Cronbach's α=0.90	Findings support construct and predictive validity. In-hospital BSES-SF scores

	up 52% Caucasian, 36.3% Southeast Asian, other 11.5%.		were also found to be positively related to exclusive breastfeeding at 4 weeks postpartum ($p<0.001$).
BSES-SF/ McCarter-Spaulding & Dennis (2010)	In-hospital Black women who were breastfeeding or stated her intention to breastfeed. n=153 follow up at 4 and 24 weeks postpartum	Cronbach's $\alpha=0.94$ item-total correlations: 0.49-0.85	Findings support construct and predictive validity. Women who were breastfeeding at 4 weeks postpartum have significantly higher in-hospital BSES-SF scores than women who discontinued breastfeeding ($p=0.04$). Higher in-hospital BSES-SF scores predicted continued breastfeeding at 4 (hazard ratio=0.97) and 24 (hazard ratio=0.96) weeks postpartum.
BPEBI / Cleveland & McCrone (2005)	Female students at university. n=479 (69% return rate) 93% white, 3.6% African American, 1.9% Asian American, 1% Hispanic in the university.	Cronbach's $\alpha=0.89$	Findings support content and construct validity. PCA with varimax rotation accounted for 53% of the variation and resulted in five

			factors.
BAPT / Janke (1992)	Women planning to breastfeed for at least 6 wks postpartum. n=248 (74% return rate) 88% white; 66% education beyond high school n=228 (92%) at 6 wks follow up.	Cronbach's α= 0.70 -0.86 for subscales	Findings support construct, content, and predictive validity. PCA with varimax rotation accounted for 35% of the variation in the attitudinal items (three factors), accounted for 41.3% of the variation in breastfeeding control items (one factor), and accounted for 58% of the variation in subjective norm items (two factors). Predictive validity differentiated exclusive breast-feeders from exclusive formula feeders at 6 and 16 weeks.
BAPT / Janke (1994)	Women planning to breastfeed for at least 8 wks postpartum; n=201 (81% return rate). 88% white; 66% education beyond high school n=174 (87%) at 8 wks follow up.	Overall Cronbach's α=0.80 Cronbach's α= 0.79 -0.85 for subscales	Findings support construct and predictive validity. PCA with varimax rotation accounted for 35% of the variation and resulted in four factors.

			Using discriminant function analysis to identify 73% of the women who weaned prematurely.
BAPT / Dick et al. (2002)	Women planned to breastfeeding for at least 8 wks postpartum; Used modified BAPT of 42 items n=291 n=269 (92%) at 8 wks follow up. 88% non-Hispanic white, 7% African American, 2% Asian, 3% Hispanic; 35% high school education, 13% baccalaureate education.	Cronbach's α =0.78 - 0.86 for subscales of original and modified BAPT	Findings support construct and predictive validity. PCA with varimax rotation accounted for 39% of the variation, and yielded four factors. Using discriminant function analysis to identify the modified BAPT as an effective predictor of 78% of women who weaned before 8 weeks and 68% of those who were still breastfeeding.
BAPT / Ryser (2004)	Low-income pregnant women. n=26 experimental group n=28 control group.	Cronbach's α = 0.78 -0.90 for pretest subscales, and 0.83 - 0.90 for posttest subscales	Findings support construct validity. Using discriminant function analysis in post-test data and identified that74.1% of the

			women had been categorized as either being willing to initiate breastfeeding in the hospital or not.
BAPT / Evans (2004)	Women planning to breastfeed for the first time at least 8 wks postpartum. n=117 (complete the BAPT1 in the last trimester and BAPT2 during hospital) n=90 (75%) at 8 weeks follow up 79% non-Hispanic whites, 18% African American, 3% Asian or Hispanic; 47% college education, 30% with graduate work.	Cronbach's α=0.67 - 0.87 for prenatal subscales, and 0.82 - 0.88 for postpartum subscales	Findings support construct validity. Using discriminant function analysis to identify the predictability of early breastfeeding attrition of the modified BAPT and showed that it predicted 58.5% of women who stopped breastfeeding by 8 weeks when administered the modified BAPT in the prenatal period and 56.5% when administered in the postpartum period.

Maternal Attitudes related to Infant Feeding and Breastfeeding Behaviors in Taiwan

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Abstract

Background: The government in Taiwan has promoted breastfeeding in recent years yet, exclusive initiation rates and continuation of breastfeeding remain low. Maternal attitudes have been found to be better predictors of infant feeding method during the postpartum period than socio-demographic factors. Understanding maternal attitudes related to infant feeding in Taiwan will support the development of better targeted, more effective health promotion programs aimed at increasing breastfeeding rates.

Objectives: To examine maternal attitudes toward breastfeeding and the relationship of these factors to breastfeeding duration at six weeks postpartum. The Iowa Infant Feeding Attitude Scale (IIFAS) was translated into Chinese for this study; a secondary aim of the study was to assess the psychometric properties of the translated tool.

Design: A prospective longitudinal study.

Setting: A public hospital in Taichung City, Taiwan.

Participants: Using convenience sample. 140 in-hospital breastfeeding mothers were recruited in the hospital setting to complete the IIFAS. A total of 120 (86%) completed 3 week follow-up interview and of those who continued to breastfeed 102 women (100%) were contacted at 6 weeks and completed the study protocol.

Methods: Following a systematic translation procedure, mothers completed IIFAS questionnaire in the hospital. Then, participating women were contacted by telephone at three weeks and six weeks postpartum to obtain information regarding infant feeding status and duration.

Results: Maternal breastfeeding attitudes were the only predictive factor of the breastfeeding duration (p=0.05). The Cronbach's alpha for internal consistency was 0.73. In-hospital IIFAS scores significantly predicted infant feeding methods at six weeks postpartum. 72.9% (n=102) of

the mothers were breastfeeding their infants, of which 37 mothers (26.4%) were exclusively breastfeeding, 65 mothers (46.4%) were partially breastfeeding at three weeks postpartum. These102 breastfeeding mothers were continued to be followed through six weeks postpartum. 62.1% (n=87) were still breastfeeding their infants, of which 34 mothers (24.3%) were exclusively breastfeeding and 53 mothers (37.9%) were partially breastfeeding at six weeks postpartum. Insufficient milk supply was the reason most often given for discontinuing breastfeeding.

Conclusions: Maternal attitudes were related to breastfeeding duration. This study provides evidence that the translated version of the IIFAS is a valid and reliable tool to assess breastfeeding attitudes among Taiwanese mothers in the population tested. Breastfeeding rates showed that the low rates of exclusive breastfeeding. Health professionals might use this tool to identify mothers at increase risk for not continuing with exclusive breastfeeding and intervention strategies need to be developed to improve rates of successful exclusive breastfeeding.

Keywords: Breastfeeding; Behavior; Iowa Infant Feeding Attitude Scale; Translation; Psychometric properties

What is already known about the topic?

- Maternal attitudes are better predictors of infant feeding method during the postpartum period than are socio-demographic factors.
- There are the low rates of exclusive breastfeeding and short overall duration of breastfeeding in Taiwan.

What this paper adds?

- Mothers with higher IIFAS scores that have a favorable attitude toward breastfeeding were less likely to discontinue breastfeeding than those with lower scores.
- The results from this study indicated that the translated version of the IIFAS is a valid and reliable measure of breastfeeding attitudes among Taiwanese mothers, and provides further evidence of the international applicability of the IIFAS.

1. Introduction

Breastfeeding is well recognized as the optimal way to nourish newborns. It is beneficial to both the developing child and the mother. The Healthy People 2010 breast feeding goals recommended breastfeeding initiation rates of 75% and six months breastfeeding rates of 50% (U. S. Department of Health and Human Services, 2000). Addendums to the initial Healthy People 2010 objectives include two new objectives related to the initiation and duration of exclusive breastfeeding; increase the exclusive breastfeeding rate through age three months to 60% and through age six months to 25% (U. S. Department of Health and Human Services, 2005). Recent statistics show that the breastfeeding initiation rate for early postpartum period in the United States is 74%, which approaches the Health People 2010 goal, yet breastfeeding rates at six months are maintained at only 42%. Additionally, rates for exclusive breastfeeding through ages three months and six months are 31% and 11%, respectively; well below the targets set by

Health People 2010 (Centers for Disease Control and Prevent, 2009). The 2020 goals are still under development but it is likely they will be in line with the 2010 goals.

Similarly, breastfeeding performance is considered poor in Taiwan. Comparing the 1960s to the 1980s, prevalence of breastfeeding declined significantly. There was a drop in initiation rates from 94.5% in 1960 to exclusive and partial rates of 5.8% and 25% in 1980 (Chen et al., 1989). The 2010 goal was for the breastfeeding rate at one month to be 64%. Also, the Department of Health encouraged women to perform exclusive breastfeeding until six months postpartum, and continue to breastfeeding (to any degree) until two years (Bureau of Health Promotion, Department of Health, Taiwan, 2005). A national survey in 2003 showed that the prevalence of exclusive and partial breastfeeding was 17.9% and 47% prior to hospital discharge, 22.3% and 48.4% at one month postpartum, and 16.7% and 17.4% at three month postpartum, respectively. The findings indicated that a significant decline of more than 50% was recognized between one and three months (Chien et al., 2005). It remains very challenging for health providers to increase the exclusive breastfeeding and prolong the duration of breastfeeding after hospital discharge in Taiwan.

Researchers have focused on identifying factors that may affect the continuation of breastfeeding. Successful breastfeeding is dependent on multiple factors associating with mother, infant and supportive environment. Some barriers include the negative attitudes of women, husbands/partners, and health care professionals toward breastfeeding (Dungy et al., 2008; Freed, Fraley and Schanler, 1993; Kuan et al., 1999). Support from husbands/partners, family, and friends has been indicated as important predictors to influence the women's choice and duration of breastfeeding (Giugliani et al., 1994; Khoury et al., 2002; Raj and Plichta, 1998). Maternal attitude is also a concept of interest to health professionals who support breastfeeding. Dungy et

al. (1994) indicated that maternal attitudes are better predictors of infant feeding method during the postpartum period than are socio-demographic factors. Shaker et al. (2004) compared the infant feeding attitudes of parents of breastfed infants with the attitudes of parents of formula fed infants at discharge by using the Iowa Infant Feeding Attitude Scale (IIFAS). They found that there was a strong correlation between maternal intentions and actual infant feeding behaviors ($p < 0.001$). The breastfeeding women had a significantly higher total attitude score to breastfeeding preference than those who chose to formula feed did ($p < 0.001$). Also, the fathers of breastfed infants had a significantly higher total attitude score to breastfeeding preference when compared with fathers of formula fed infants ($p < 0.001$).

Although breastfeeding is a common practice in Taiwan, the exclusive breastfeeding rate is very low. Maternal positive attitudes toward breastfeeding are associated with continuing to be breastfeeding at the first month postpartum (Chen and Chi, 2003). Several reasons have been linked to the low percentage rate of breastfeeding, including little support from the family of postpartum women and few consulting resources for breastfeeding in the community, facilities and policies in medical institutions and workplaces that are unsupportive of breastfeeding (Ko, 2002).

However, while some women will choose to perform breastfeeding for a limited amount of time, it has been pointed out that many women have not been successful in breastfeeding for a longer period. 87% of women who stopped breastfeeding within the first six weeks would have liked to breastfeed for a longer period. For those women who breastfed for at least six weeks, 37% would have preferred to continue for a longer period (Hamlyn et al., 2002). The possible modifiable variables related to breastfeeding outcomes include breastfeeding attitudes,

experience, satisfaction, and breastfeeding confidence. Many self-report assessment tools have been developed to increase the ability of health professionals to determine these modifiable variables associated with the breastfeeding behavior (Ho, & McGrath, 2010). The research conducted to-date related to mothers' attitudes toward breastfeeding have not been sufficiently examined with a validated breastfeeding attitudes instrument in Taiwan. Therefore, a need to understand mothers' breastfeeding attitudes for developing effective interventions and measuring outcomes in terms of changes in maternal attitudes and behavior is clearly needed. The purpose of this study is to better understand the relationship between maternal breastfeeding attitudes and breastfeeding duration at six weeks postpartum. The Iowa Infant Feeding Attitude Scale was translated into Chinese for this study and assessment of the psychometric properties is also a priority in the analysis. It is hypothesized that positive maternal attitudes as measured by the Iowa Infant Feeding Attitude Scale, would positively influence mothers' choice among feeding methods. The specific aims of this study were to: (1) explore maternal attitudes and socio-demographic variables associated with the continuation of breastfeeding through the first six weeks postpartum; (2) examine the reasons for mothers to cease breastfeeding and their perceived social support at the first six weeks postpartum; and (3) examine the reliability and validity of the Chinese version of the Iowa Infant Feeding Attitude Scale (Da La Mora and Russell, 1999) among the Chinese population in Taiwan.

2. Methods

2.1. Sample

A convenience sample consisting of a 140 new mothers was recruited from a public hospital between October 2009 and January 2010 in Taichung City, Taiwan. The computer-assisted

power analysis (NQuery 7.0) was used to determine the sample size for log- rank test of survival analysis in two groups (any breastfeeding group; bottle feeding group). If alpha level of 0.05 (2-tailed), hazard ratio of 2.437 (assuming that the proportion of the subjects who breastfeed is 0.65, and the proportion of the subjects who bottle-feed is 0.35 at 6 weeks postpartum), and a power of 80% are set, a minimum of 45 subjects in each group is needed. In additional, in terms of item analysis for the translated tool a minimum of five subjects per item within the scale is needed to minimize the probability of chance results when analyzing instrument psychometrics (Crocker and Algina, 1986; Ferketich, 1991; Nunnally, 1978). The Iowa Infant Feeding Attitude Scale (IIFAS) consists of 17 items, thus a sample size of at least 85 is adequate for these analyses. Additionally, Hansen et al. (1990) found that the average attrition rate for follow-up at 3 months was 18.6% and 32.5% at 3 years from a meta-analysis of 85 studies. In this study, participants were followed up through 6 weeks postpartum, and the planned attrition rate was calculated at 20%. A total of 140 participants were recruited based on power analysis and general consideration for having an adequate sample size.

Eligible participants were all hospitalized for childbirth. All participants met the following inclusion criteria: (1) age between 18 and 45 years old, (2) have given birth to a healthy, singleton, term infant (≥37 weeks and ≥ 2500 g) during hospitalization, and (3) all participants were able to read and write in Chinese and understand the survey directions and questions (4) only women who had initiated breastfeeding of their infants during the hospital stay were included. Exclusion criteria included: (1) Women suffering from postnatal complications or with previous mental illness, (2) Infants who had major illness (chronic, acute, or congenital illness), and (3) infants who were exclusively bottle fed formula or fed pumped breast milk. Mothers

providing exclusively pumped breast milk were excluded because what is being studied here is not merely breast milk, but particularly the mothers' act of breastfeeding the infant.

2.2. Variables Definitions

For this study, definitions of breastfeeding used in this study are modified from the World Health Organization (WHO) definitions (WHO, 1991). They define breastfeeding as the infant receiving breast milk direct from the breast or expressed however, for this study infant feeding categories were operationally divided into three categories to increase clarity: exclusive breastfeeding; partial breastfeeding; and bottle feeding. Exclusive breastfeeding was defined as the infant received only human milk at the breast, with no formula milk provided. If mothers pumped the milk and delivered it by bottle, it was not considered exclusive breastfeeding in this study. Partial breastfeeding was defined as infants who received human milk and formula by bottle feeding. The information of exclusive breastfeeding and partial breastfeeding was later combined into the category of "any breastfeeding" for some of the analyses, which included all infants received human milk to any degree. Bottle feeding was defined as infant received formula from a bottle. Breastfeeding duration was defined as the total number of days from the beginning to end of breastfeeding. Since the study was from birth to 6 weeks postpartum, the maximum number of days was 42. Duration of breastfeeding data was obtained by phone calls to the women at three-week and six weeks postpartum. Women were asked how they are feeding their baby at home, and classified as exclusive breastfeeding, partial breastfeeding, or bottle feeding. Weaning was defined as "ceased breastfeeding and do not intend to breastfeeding again." The "Breastfeeding Attitude" variable was defined as the degree of positive or negative value placed on breastfeeding (Ajzen, 1988). The maternal breastfeeding attitudes were measured

using the Iowa Infant Feeding Attitude Scale (IIFAS) (Da La Mora and Russell, 1999). Socio-demographic characteristics included age, education level, marital status, baby sex, family annual income, employment status, parity, if women have the previous breastfeeding experience, the condition of the previous breastfeeding experiences, and method of delivery, were collect at admission to the study as reported by the mothers. Maternal age was collected as a continuous variable. Maternal education was categorized as senior high school or lower, college, university, or graduate or above. Maternal marital status was categorized as married, divorced or separated, or single. Baby sex was categorized as female or male. Family annual income refers to the total parental income per year, and was divided into four categories in new Taiwan dollars (NT$= New Taiwan Dollars, US$ 1=NT$ 32 in 2010): below 400,000, 400,000-600,000, 600,001-1,000,000, or more than 1,000,000. Maternal employment status was categorized as mothers returning to work after maternity leave or unemployed. Maternal parity was categorized as first birth, second birth, third or higher birth. Maternal previous breastfeeding was categorized as yes or no. The condition of the previous breastfeeding experience was categorized as good or not good. Method of delivery was categorized as cesarean section or vaginal delivery. The demographic variables were collected after the questionnaire was completed to minimize subject burden, preserve privacy, and reduce the risk of bias.

2.3. Procedure

This study was approved by research ethics committee in the hospital, and by the researchers' university departmental ethics committee. A face-to-face interview with each mother was conducted before discharge to administer the IIFAS questionnaire and to collect the socio-demographic data. Breastfeeding duration was collected by telephone at three weeks and

six weeks postpartum to record the current status of breastfeeding and infant feeding method. In the final follow up at either six weeks or when it was determined that breastfeeding was discontinued, mothers were asked during the phone interviews to provide their reasons for breastfeeding cessation and their perceived social support. Women were asked an open-ended question to provide the reasons regarding weaning. The question was "what are the reasons you choose to stop breastfeeding?" They also are asked two open-ended questions about the support they received: "as you look back over the time you have breastfeed, who have been supportive to you since baby's birth?" and "what type of support did you receive?"

2.4. Iowa Infant Feeding Attitude Scale (IIFAS)

The Iowa Infant Feeding Attitude Scale (IIFAS) consists of 17 items with a 5-point Likert scale ranging from 1 (strongly disagree) to 5(strongly agree). Nine of the items are worded in a manner favorable to breastfeeding, and the remaining favorable to formula feeding. Items favoring formula feeding are reverse scored (i.e., 1=5, 2=4, 4=2, and 5=1), and a total of attitude score is computed. Total attitude scores could range from 17 (indicating positive formula feeding attitudes) to a high of 85 (reflecting positive attitudes toward breastfeeding). The IIFAS can be used to predict the choice of infant feeding method as reflected by measures of behavioral intentions; and to predict the actual feeding behavior as reflected by the duration of breastfeeding, and its predictive validity shows independent of socio-demographic variables (De La Mora and Russell., 1999).

Studies using the IIFAS in the United States (De La Mora and Russell, 1999; Marrone et al., 2008; Simmie, 2006), Australia (Giglia et al., 2007; Scott et al., 2006), Northern Ireland (Sittlington et al., 2007), Romanian (Wallis et al., 2008) and Scotland (Dungy et al., 2008; Scott

et al., 2004; Tappin et al., 2006) have reported adequate predictive validity and internal consistency with the Cronbach's alpha ranging from 0.79 in Northern Ireland (Sittlington et al., 2007) to 0.86 in the United States (De La Mora and Russell, 1999) and 0.89 in Scotland (Dungy et al., 2008).

2.5. Translation Process

The IIFAS has not been previously used in Asia countries and it has not been previously translated into Chinese and used with Chinese population. For use in this study, a systematic process recommended by Beaton et al. (2002) was used for translating of the tool. The first stage was the forward translation by two bilingual translators with Chinese as their mother tongue to change the instrument from English into Chinese. A synthesis of these two translations was provided by the researcher of this study. Then, three bilingual translators blinded to the original English version worked from the synthesis version of questionnaire to translate it back into the English. This process was for validity checking to make sure the translated version accurately reflects the items content of the original version. The back translators were non-professional translators to ensure the language was commonly understood by the Chinese-speaker mothers. A synthesis of these three translations also was produced by the researcher. In this step, the researcher worked to be a mediator and to examine the differences among these three back-translated versions, and produced one common translation.

Semantic equivalence and content equivalence are the two major dimensions of cross-culture equivalences tested in this study. An innovative method developed by Sperber et al., (1994) was used in the Chinese version of IIFAS for establishing semantic equivalence and validating the translated instrument. Each item in the original and back-translated versions was ranked in terms

of comparability of language and similarity of interpretability. Comparability of language refers to the formal similarity of words, phrases, and sentences. Similarity of interpretability refers to the degree to which the two versions engender the same response even though the wording is not the same. This process enables the researchers to identify potentially problematic items and retranslate them until the researchers are as confident as possible that these items will be interpreted in the same way. Three native English speakers who were doctoral students were asked to participant in this process to rate their agreement independently between the original version and back-translated version of IIFAS. As a result, no modifications to items were indicated. Moreover, content equivalence of the translated IIFAS was established for each item using the content validity index (CVI) by three content experts in Taiwan. All of the experts were faculty in Taiwan and experts in women's health and breastfeeding. Two of them had completed doctoral degrees in nursing. The CVI was used to quantify the extent of agreement between the three experts. These three experts were asked to rate the items using the CVI, and were also asked for suggestions about how to improve the items. They rated the cultural relevancy of each item in measuring the construct of breastfeeding attitudes in Chinese people. The CVI was equal to or higher than 0.8 indicating that the translated instrument had high content validity (Waltz et al., 1991).

The final stage of the process was pretest of the pre-final versions. Each subject completed the questionnaire, and was then interviewed to explore what they thought about each item and their response. In this stage, the translated questionnaire was pretested with 10 Taiwanese women who were breastfeeding to evaluate participants' understanding about the items and readability of each item of the IIFAS Chinese version. The results showed that only one item required attention. The item "A mother who occasionally drinks alcohol should not breast-feed

her baby" was modified to "A mother who drinks alcohol once a week should not breast-feed her baby". In this study, the "occasionally" is defined as "once a week". The final version of the translated IIFAS incorporated 17 items with one requiring minor modifications. Finally, to establish technical equivalence, the translated IIFAS was administered by using the paper and pencil method to collect data from hospitalized breastfeeding women after birth, a technique consistent with the original study.

2.6. Data Analysis

Data analysis included both quantitative and qualitative processes. SPSS version 17 for Windows statistical software program was used for quantitative data analysis. All data were reviewed and examined for coding errors or missing data. Missing data were handled by using the exclude cases pairwise option. The relationship between IIFAS scores and socio-demographic variables was tested by using correlation, t-tests, or a one-way analysis of variance. The significance level for all statistical analysis was set at 0.05.

The reliability of the translated IIFAS was evaluated by using the Cronbach's alpha coefficient and corrected item-total correlation. Validity was assessed by examining predictive validity. Predictive validity was determined through the examination of participants' IIFAS scores and infant feeding method at six weeks postpartum by using t-test to evaluate if there was a significant difference between breastfeeding group and bottle-feeding group. Moreover, the one-way analysis of variance was used to examine if there was a significant difference among exclusive breastfeeding, partial breastfeeding and bottle feeding at six weeks postpartum.

Determinants of breastfeeding duration were investigated in the regression analysis using Cox's proportional hazards model. The model allows joint estimation of the effects of predictor

variables on the "hazard", the risk of the breastfeeding cessation, rather than the duration itself, and can be used to analyze data containing censored observations (Cox and Oakes, 1984). The censored data means data from mothers who continue to breastfeed beyond the end the study period or beyond the time at which mothers drop out from the study.

The qualitative data were obtained from the open-ended questions related to mothers' reasons for changing feeding method form breastfeeding to bottle-feeding and their perceived social support. Content analysis was used to identify prominent themes and categories. The categories were then coded and ranked in order of frequency to determine the most common reasons for maternal cessation of breastfeeding and their perceived social support.

Results

3.1. Description of sample

A total of 140 mothers met all the study criteria and were enrolled in the study. The mean age of the sample was 30.04 years (SD=4.29), ranging from 19-41 years. The characteristics of the population enrolled are shown in Table 1. Most of the women were approximately 30.0 years old. The majority had a university education (34.3%), and 35% of the families had an annual income of 400,000-600,000 NT$. 93.6% of women were married, and 64.3% of the women indicated that they would return to work after maternity leave. Of the 140 mothers who enrolled into this study and completed initial IIFAS, telephone interviews were completed with 120 mothers at three weeks postpartum (14% attrition). Attrition resulted from loss of contact with the mothers. There were no differences between participants and women who were lost to follow up in this study with respect to IIFAS scores, age, education, employee status, parity, if women have previous breastfeeding experience, the condition of the previous breastfeeding experience, and

method of delivery (Table 2 and Table 3). Although the sample was large enough to detect the significance of breastfeeding attitudes in relationship to the outcomes of breastfeeding duration and factors related to breastfeeding duration, there were not enough participants to compare marital status and family annual income individually between participants and women who were lost to follow up.

At three weeks postpartum, 72.9 % (n=102) of the mothers were breastfeeding their infants, of which 37 mothers (26.4%) were exclusively breastfeeding, 65 mothers (46.4%) were partially breastfeeding. The102 women (those still breastfeeding) were continued to be followed through six weeks postpartum. Of the 102 breastfeeding mothers all were able to be contacted again at six weeks postpartum (0% attrition), 62.1% (n=87) were still breastfeeding their infants, of which 34 mothers (24.3%) were exclusively breastfeeding and 53 mothers (37.9%) were partially breastfeeding.

3.2. IIFAS and demographic factors

The relation between demographic factors of 140 in-hospital women and IIFAS scores was examined. Maternal age ($r=0.20$, $p<0.05$) was positively correlated with IIFAS scores. There were also differences in regard to the family annual income. Post hoc analysis indicated that maternal attitudes became more favorable towards breastfeeding as household income increased <400,000 and 400,000-600,000(M difference =-2.73) ($p<0.05$), <400,000 and 600,001-1,000000 (M difference=-3.82)($p<0.05$), and <400,000 and >1,000000(M difference= 6.17) ($p<0.05$) (Table 4, Table 5 and Table 6).

3.3. Predictive validity

Predictive validity was determined through the examination of mothers' IIFAS scores in-hospital and their choice of feeding method at 6 weeks postpartum. Significant differences were found in IIFAS scores among mothers who at 6 weeks postpartum were either any breastfeeding (Mean=65.6, SD=7.1) or bottle-feeding (Mean=62.4, SD=6.2; t (118) =-2.33, $p<0.05$).

Mothers were further categorized according to their breastfeeding level and a one-way analysis of variance was conducted to examining type of feeding (exclusive vs. partial vs. bottle) on IIFAS scores. Mothers who were exclusively breastfeeding at 6 weeks postpartum had significantly higher IIFAS scores (Mean=66.7, SD=6.9) than mothers who were either partially breastfeeding (Mean=64.9, SD=7.2) or bottle-feeding (Mean=62.4, SD=6.2; F (2) =3.4, $p<0.05$).

3.4. Factors predictive of breastfeeding duration

To determine factors contributing to breastfeeding duration at 6 weeks postpartum, a Cox regression analysis was performed. Factors affecting the continuation of breastfeeding are shown in Table 7. Only one factor that was independently related to duration of breastfeeding was maternal IIFAS scores. Risk for cessation of breastfeeding at six weeks postpartum was negatively related to mothers' IIFAS scores; that is, mothers with higher IIFAS scores that have a favorable attitude toward breastfeeding were less likely to discontinue breastfeeding than those with lower scores (B=-0.06, SE=0.03,Hazard Ratio=0.938,p=0.03).

3.5. Reasons for weaning from breast milk

Women who had decided to bottle feed by the time of the 3-week or 6-week postpartum call were asked why they stopped. Eighteen women (12.9%) discontinued breastfeeding within three weeks postpartum. The common reason cited by the women was insufficient milk supply

(89.5%). The second reason was painful nipples (10.5%). Fifteen more women (10.7%) weaned and were bottle-feeding between the three and six weeks postpartum (for a total of 33 women, 45.5%). The reasons for weaning were insufficient milk supply (52.9%), return to work (35.3%), not knowing if baby had enough to eat (5.9%) and painful nipples (5.9%) (Table 8).

3.6. Women's perceived social support

When the women were asked who had been supportive to them after the baby was born and what type of support they received, several answers were provided. The most commonly reported people of support was husband/partner (n=120, 47.4%). The other support that women received was parents in law or parents (n=94, 37.2%), friends (n=20, 7.9%) and sisters (n=19, 7.5%). Also, types of support reported by the women at home were "family members encourage mothers to breastfeeding (n=120, 44.1%)", "family members help in household chores (n=75, 27.6%)", "women's mother or mother in law cooks some foods to increase the breast milk production (n=45, 16.5 %)", and "family members help to take care children (n=32, 11.8 %)".

3.7. Internal reliability of the Chinese version of the IIFAS

Cronbach's alpha coefficient was used to evaluate the internal reliability of the translated IIFAS in the sample of 140 breastfeeding women in-hospital. Internal reliability was found to be adequate (α=0.73). The corrected item-total correlations for the 17 items were all positive, ranging from 0.23 to 0.48. Total scores for the attitude scale ranged from 49-82, with a mean of 65 and a standard deviation of 6.90 (Table 9).

Discussion

The Department of Health, Executive Yuan, Taiwan has launched national programs to promote breastfeeding since 1992, including regulation of the marketing of breast milk substitutes by companies making baby formula, development of facilities for breastfeeding in public, breastfeeding counseling and training courses for health workers, mass media programs, and adaptation of Ten Steps to Successful Breastfeeding program to certify Baby-Friendly hospital (Chien et al., 2005). After years of breastfeeding promotion, breastfeeding is more common in Taiwan even though the duration rates remain low. We demonstrated that the prevalence of exclusive and partial breastfeeding in this study was 26.4% and 46.4% at three weeks, and 24.3% and 37.9% at six weeks postpartum, respectively. The Bureau of Health Promotion, Department of Health, Taiwan (2009) reported the rates of exclusive breastfeeding were 29.42 % prior to hospital discharge, 33 % at one month postpartum, 17 % at four months and 13 % at six months in 2004. In this study, the breastfeeding rates (to any degree) after hospital discharge approached the policy goals but continued to show decreased rates of exclusive breastfeeding.

High IIFAS scores were associated with maternal intention to breast-feed, while lower scores indicated maternal intention to formula-feed. IIFAS scores differentiated between mothers on the demographic variables. In this study, mothers with higher IIFAS scores indicated a preference for breastfeeding, and tended to be older and to have a higher family annual income. These findings are consistent with previous studies (De La Mora and Russell, 1999; Sittlington et al., 2007). There has been relatively little research on the influence of demographic factors on the maternal breastfeeding attitudes in eastern countries. However, our results also found these demographic variables to be important.

One of the significant findings in this study is the predictive validity of IIFAS, indicating that the IIFAS is a valid instrument for predicting breastfeeding level (exclusive vs. partial vs. bottle) and duration. Women with higher IIFAS scores were significantly more likely to breastfeed at 6 weeks postpartum. Moreover, The IIFAS scores were associated with breastfeeding level (exclusive vs. partial vs. bottle). The higher women scored on the IIFAS, the more likely they were to breastfeed and to do so exclusively at 6 weeks postpartum than would women who scored lower on the IIFAS. The findings for predictive validity suggest that the Chinese version IIFAS is ready for clinical use to identify Chinese women at high risk for ceasing breastfeeding. For example, if women's IIFAS scores are low, additional support may be necessary. Practitioners can then conduct breastfeeding promotion programs that specifically target the issues that are relevant to the population based on IIFAS scores. However, future research needs to evaluate the psychometric properties of the translated IIFAS with other Chinese-speaking mothers in several different populations, and to further establish predictive validity through a longer follow-up in the postpartum period.

The factors associated with the duration of breastfeeding were studied. Our findings showed that maternal attitudes toward breastfeeding were the only predictive factor of the duration of breastfeeding. Chen and Chi (2003), in a Taiwan study, found that positive breastfeeding attitudes was the important determinant for women's behavior to breastfeed for a longer period of time within one month postpartum. Similarly, other studies (De La Mora and Russell, 1999; Scott et al., 2008) indicated that maternal attitudes are a stronger independent predictor of breastfeeding duration than sociodemographic factors. Our findings are consistent with these previous studies. Thus, highly positive maternal breastfeeding attitudes may motivate women to breastfeed for six weeks postpartum. This finding is important to health professionals to design

breastfeeding promotional strategies that should be developed to specifically target women with low level attitudes to prolong duration of breastfeeding.

The most common reason cited by the women for weaning breastfeeding prior to six weeks was insufficient milk supply. This finding was similar to those found in other studies (Chen and Chi, 2003; Lewallen et al., 2006; Otsuka et al., 2008). Not knowing if the baby had enough to eat was the third reason between three and six weeks postpartum. These two reasons are related. Most women can produce enough breast milk to meet their baby's demand (Giugliani, 2004). "Insufficient milk supply" may not reflect the true reason for early weaning by women. Several factors may cause women's perceived insufficient milk, such as the women's uncertainty about her capacity to feed their baby properly, no knowledge about the normal behavior of a baby and negative opinions of significant persons (Giugliani, 2004). Also, "insufficient milk supply" is given by some women as a socially acceptable reason to ceasing breastfeeding when women decide that they no longer wish to do so (Hitchcock and Coy, 1988). Additional researches are needed to use validated tools that identify women who are really at high risk for problems with insufficient milk supply. Also, health professionals need to teach the women how to know if the baby has low intake of breast milk through checking the number of wet diapers a day (less than six to eight) and infrequent bowel movements, with a small amount of stools (Powers, 2001). Moreover, some suggestions can be given to the women to increase milk production, such as improve latch-on, increase the frequency of feeding, offer both breasts in each breastfeeding and drink enough fluids (Giugliani, 2004). Perceived insufficient milk supply is considered modifiable. Therefore, implementation of strategies to provide well-informed intervention may prevent the development of maternal perceptions of insufficient milk supply.

Returning to work is a common reason women provide for weaning (Chen and Chi, 2003; Lewallen et al., 2006). Most employed women had eight weeks maternity leave in Taiwan. Thus, "return to work" became the reason for ceasing breastfeeding around six weeks. To prevent the discontinuing breastfeeding, community health nurses should undertake home visits with postpartum women to provide information about how to pump, maintain lactation and store breast milk while the women are at work. When the women return to work, occupational health nurses can provide support and strategies to help women to continue breastfeeding. Support from the workplace, including providing pumps and pumping room, regular breaks to express milk, and support groups for a longer period of time for breastfeeding.

Painful nipples were reported in other studies as a reason for early weaning (Kirkland and Fein, 2003; Lewallen et al., 2006; Schwartz et al., 2002).Similarly, painful nipples were also a primary reason cited by the women in this study. The most common cause of sore nipples is due to nipple trauma caused by improper positioning and inappropriate latch-on during breastfeeding (Woolridge, 1986). It is important for nurses to assist women to use a proper breastfeeding technique at the first time breastfeeding after birth.

Social support was another factor found to be related to type of maternal feeding choice. Women's husband/partner was found to be the main source of support in Taiwan. Other studies (Littman et all., 1994; Matthews et al., 1998) also found the baby's father to have a significant influence on the women's choice of feeding method. Family members were also reported by women in this study as sources of support about feeding decision. This finding was consistent with other studies that found the importance of support from family members (Evans et al., 2004; Lewallen et al., 2006; Myerink and Marquis, 2002). Generally, Taiwanese postpartum women felt that their family members were very supportive. It would be helpful to know if women have

such a support person in their lives or whether these people supportive while they are breastfeeding. If possible, it may be helpful to involve these supportive people in a breastfeeding promotion program to increase the duration of breastfeeding. Interestingly, no women reported that the health professionals were their supportive source. Thus, practitioners or community health nurses may provide information about successful breastfeeding techniques or phone consultation services while women are at home to become one of the supportive sources. When the women were asked about the type of support they received, women indicated that they received both emotional and instrumental support from their family members. Specifically, all women reported that they have the encouragement from their family members. Also, the family members helped women in household chores, cooking foods and taking care of children. This indicated that the birth of a new infant is an important family event in eastern countries. Postpartum women in Taiwan received valuable support from their family member to help them to go through the postpartum period after childbirth.

This is the first study to report on the use of the IIFAS to describe maternal attitudes toward breastfeeding in Taiwan. The findings from this psychometric investigation are consistent with the original study (De La Mora and Russell, 1999) conducted with an English-speaking population and suggest that the translated version of the IIFAS is a valid and reliable tool to assess breastfeeding attitudes among Chinese mothers in the population tested. This study also provides further evidence of the international applicability of the IIFAS and demonstrated that measures can be translated while maintaining the reliability and validity of the tool. The translation process following the systematic process recommended by Beaton et al. (2002) was rigorously conducted to ensure that equivalence was established. Content equivalence was determined using the content validity index (CVI) as each item was examined for cultural

similarity while bilingual translators ensured semantic equivalence through blinded back translators. Finally, the pilot test with breastfeeding mothers was conducted to ensure that the tool had acceptable readability of each item.

In addition to establishing equivalence, the Cronbach's alpha coefficient was 0.73, reaching the recommended alpha for established tools (DeVellis, 2003), and is comparable to the original IIFAS Cronbach's alpha coefficient of 0.68 in the sample of breastfeeding women. Also, the mean score of 65 and standard deviation 6.90 are similar to the original IIFAS mean score of 66 and standard deviation 7 (De La Mora and Russell, 1999).

There are several limitations in this study. First, the study population was mostly well educated, married, and were of middle class income. Women from lower socioeconomic groups are known to be at a higher risk to discontinue breastfeeding (Dennis, 2003; Riordan and Gill-Hopple, 2001). Additional research with this population is needed to determine if the results can be generalized to socioeconomically disadvantaged women. Second, this study used a convenience sample, and all women come from one geographical area in Taichung, Taiwan. Thus, the results may not be generalizable to women in Taiwan. Finally, this study investigated the relationships between maternal attitudes and socio-demographic factors on the continuation of breastfeeding. Women from different areas may have different factors associated with the duration of breastfeeding. Future studies could extend various factors in relation to infant feeding decision.

Conclusion

This appears to be the first maternal attitudes survey that used the IIFAS in Taiwan. The findings from this study provide clearly evidence for the reliability and validity of the IIFAS.

The IIFAS is an easily administered and scored instrument that can be used to identify maternal attitudes toward breastfeeding. Also, one of our goals was to find factors that influence the duration of breastfeeding in postpartum women to improve the effectiveness of breastfeeding promotion. The findings indicated that maternal breastfeeding attitudes were related to breastfeeding duration at six weeks postpartum. The sociodemographic factors associated with method of infant feeding may be difficult to change. However, maternal infant feeding attitudes are likely to change in response to the information provided by breastfeeding promotion programs. Practitioners can then shape interventions that specifically target relevant issues. Moreover, insufficient milk supply is the most common reason for women to stop breastfeeding within six weeks postpartum in this study. Insufficient milk supply is considered as the modifiable factor. Efforts to enhance breastfeeding education to reduce the incidence of insufficient milk supply may be an important element for improving the breastfeeding rates. Family members were seen by women as major sources of support at home. Strategies for changing breastfeeding attitudes might include not only mothers, but husbands/partners, mothers, mothers in law, and friends. Family members especially need more information and help in supporting breastfeeding mothers for improving rates of successful breastfeeding. Additionally, the role of health professionals in home breastfeeding support cannot be overlooked. Health professionals should be better trained in the area of breastfeeding to offer better assistance to the breastfeeding women on how they may continue breastfeeding. This study needs to be replicated in different cities in Taiwan to verify our results. Also, further research should explore the association of women and their social network attitudes with duration of breastfeeding.

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Table 1
Characteristics of the study population (n=140)

Variables	Number	%
Age	140	Mean: 30.0
Maternal education		
Senior high school or lower	45	32.1
College	40	28.6
University	48	34.3
Graduate or above	7	5
Marital status		
Married	131	93.6
Divorced or separated	2	1.4
Single	7	5
Family annual income		
Below 400,000	48	34.3
400,000-600,000	49	35
600,001-1,000,000	34	24.3
More than 1,000,000	9	6.4
Employment status		
Return to work after maternity leave	90	64.3
Unemployed	50	35.7
Parity		
First birth	67	47.9
Second birth	60	42.9
Third or higher birth	13	9.3
Baby sex		
Female baby	72	51.4
Male baby	68	45.7
The previous breastfeeding experience		
Yes	64	45.7
No	76	54.3
The condition of previous breastfeeding experience		
Good	45	70.3
Not good	19	29.7
Method of delivery		
Cesarean section	44	31.4
Vaginal delivery	96	68.6

Table 2
Comparison of characteristics between participants and women who were lost to follow up in t-tests

Variables	Participants (n=120) Number (%)	lost to followed up (n=20) Number (%)	p value
IIFAS scores	120 (Mean:64.7)	20(Mean:63.5)	0.47
Maternal age	120(Mean:30.1)	20(Mean:29.7)	0.71

Table 3
Comparison of characteristics between participants and women who were lost to follow up in Chi-Square test

Variables	Participants (n=120) Number (%)	lost to followed up (n=20) Number (%)	p value
Maternal education			
Senior high school or lower	37 (30.8)	8 (40)	0.51
College	35 (29.2)	5 (25)	
University	43 (35.8)	5 (25)	
Graduate or above	5 (4.2)	2 (10)	
Employment status			
Return to work after maternity leave	78 (65)	12 (60)	0.67
Unemployed	42 (35)	8 (40)	
Parity			
First birth	54 (45)	13 (65)	0.14
Second birth	53 (44.2)	7 (35)	
Third or higher birth	13 (10.8)	0	
Baby sex			
Female baby	63 (52.5)	5 (25)	0.02
Male baby	57 (47.5)	15 (75)	
The previous breastfeeding experience			
Yes	57 (47.5)	7 (35)	0.30
No	63 (52.5)	13 (65)	
The condition of previous breastfeeding experience			
Good	39 (68.4)	6 (85.7)	0.32
Not good	18 (31.6)	1 (14.3)	
Method of delivery			
Cesarean section	35 (29.2)	9 (45)	0.16
Vaginal delivery	85 (70.8)	11 (55)	

Table 4
Differences in demographic factors and IIFAS scores in correlation test

Demographic factors	n=140	IIFAS Mean (SD)	p value
Age	30.04 (n=140)	64.55 (6.90)	0.02

Table 5
Differences in demographic factors and IIFAS scores in a one-way analysis of variance

Demographic factors	n=140	IIFAS Mean (SD)	p value
Education level	Senior high school or lower (n=45)	63.33 (6.12)	0.46
	College (n=40)	65.08 (5.87)	
	University (n=48)	64.90 (7.99)	
	Graduate or above (n=7)	67.00 (9.18)	
Marital status	Married (n=131)	64.75 (6.93)	0.40
	Divorced/Separated (n=2)	63.50 (10.61)	
	Single (n=7)	61.14 (5.40)	
Family annual income (in NT$)	Below 400,000 (n=48)	62.27 (5.75)	0.02
	400,000-600,000 (n=49)	65.00 (6.28)	
	600,001-1,000,000 (n=34)	66.09 (7.66)	
	More than 1,000,000 (n=9)	68.44 (9.83)	
Parity	First birth (n=67)	64.51 (6.67)	0.88
	Second birth (n=60)	64.40 (7.46)	
	Third or higher birth (n=13)	65.46 (5.72)	

Table 6
Differences in demographic factors and IIFAS scores in t-tests

Demographic factors	n=140	IIFAS Mean (SD)	p value
Employment status	Return to work (n=90)	64.62 (7.05)	1.22
	Unemployed (n=50)	64.42 (6.70)	
Baby sex	Female (n=68)	64.74 (6.03)	0.76
	Male (n=72)	64.38 (7.67)	
Previous breastfeeding Experience	Yes (n=64)	64.62 (7.35)	0.91
	No (n=76)	64.49 (6.55)	
The condition of previous breastfeeding experience	Good (n=45)	65.58 (7.52)	0.11
	Not good (n=19)	62.37 (6.58)	
Method of delivery	Cesarean section (n=44)	64.84 (6.44)	0.74
	Vaginal delivery (n=96)	64.42 (7.13)	

Table 7

Factors associated with the continuation of breastfeeding in multiple Cox regression models

Major Factors	B	SE	Hazard Ration (95%CI)	P value
IIFAS	-0.06	0.03	0.94 (0.88-0.99)	0.03
Age	-0.03	0.05	0.98 (0.88-1.09)	0.65
Income				0.58
Below 400,000[a]			1.00 (reference)	
400,000-600,000	-0.91	0.75	0.40 (0.09-1.76)	0.23
600,001-1,000,000	-0.78	0.69	0.46 (0.12-1.76)	0.26
More than 1,000,000	-1.00	0.74	0.37 (0.09-1.57)	0.18
Employment status				
Unemployed	0.22	0.43	1.25 (0.54-2.90)	0.60
Parity				0.16
First birth[a]			1.00 (reference)	
Second birth	-1.14	0.63	0.32 (0.09-1.11)	0.07
Third or higher birth	-0.84	0.56	0.43 (0.14-1.29)	0.13
Baby sex				
Male	-0.26	0.37	0.77 (0.37-1.61)	0.49
Previous breastfeeding experience				
No	-0.77	0.58	0.43 (0.15-1.43)	0.18
Method of delivery				
Vagina delivery	0.24	0.40	1.27 (0.58-2.77)	0.55

Abbreviations: CI, confidence interval.

[a] Reference category.

Table 8
Percentage of women citing given reason for discontinuing breastfeeding

Reason	Week 3 (n=18)	Week 6 (n=15)
Insufficient milk supply	89.5 %	52.9 %
Painful nipples	10.5 %	5.9 %
Return to work		35.3 %
Not knowing if baby had enough to eat		5.9 %

Table 9
IIFAS Item-total statistics

Item	Item-total correlation
1. The nutritional benefits of breast milk last only until the baby is weaned from breast milk.	0.30
2. Formula-feeding is more convenient than breastfeeding.	0.31
3. Breast-feeding increases mother-infant bonding.	0.32
4. Breast milk is lacking in iron.	0.43
5. Formula-fed babies are more likely to be overfed than are breast-fed babies.	0.27
6. Formula-feeding is the better choice if a mother plans to work outside the home.	0.32
7. Mothers who formula-feed miss one of the great joys of Motherhood.	0.28
8. Women should not breast-feed in public places such as restaurants.	0.30
9. Babies fed breast milk are healthier than babies who are fed formula.	0.45
10. Breast-fed babies are more likely to be overfed than formula-fed babies.	0.48
11. Fathers feel left out if a mother breast-feeds.	0.25
12. Breast milk is the ideal food for babies.	0.40
13. Breast milk is more easily digested than formula.	0.38
14. Formula is as healthy for an infant as breast milk.	0.42
15. Breast-feeding is more convenient than formula feeding	0.34
16. Breast milk is less expensive than formula	0.32
17. A mother who drinks alcohol once a week should not breast-feed her baby.	0.23

Appendix A

Institutional Review Board Submission and Approval

Dissertation Chair: Jacqueline M. McGrath

Student Investigator: Yen-Ju Ho

VCU RESEARCH PLAN TEMPLATE

Use of this template is required to provide your VCU Research Plan to the IRB. Your responses should be written in terms for the non-scientist to understand. If a detailed research protocol (e.g., sponsor's protocol) exists, you may reference that protocol. NOTE: **If that protocol does not address all of the issues outlined in each Section Heading, you must address the remaining issues in this Plan**. **It is NOT acceptable to reference a research funding proposal**.

ALL Sections of the Human Subjects Instructions must be completed with the exception of the Section entitled "Special Consent Provisions." Complete that Section if applicable. When other Sections are not applicable, list the Section Heading and indicate "N/A."

NOTE: The Research Plan is required with ALL submissions and MUST follow the template, and include version number or date, and page numbers.

DO NOT DELETE SECTION HEADINGS OR THE INSTRUCTIONS.

I. TITLE

Maternal Attitudes related to Infant Feeding and Breastfeeding Behaviors in Taiwan

II. STAFFING

A. In the table below (add additional rows as needed), indicate: (1) key project personnel including the principal investigator and individuals from other institutions, (2) their qualifications, and (3) a brief description of their responsibilities.

NAME OF INDIVIDUAL	QUALIFICATIONS	RESPONSIBILITIES
Jacqueline M. McGrath	PhD	Student Advisor/Dissertation Chair
Yen-Ju Ho	MS, RN	Student Investigator

B. Describe the process that you will use to ensure that all persons assisting with the research are adequately informed about the protocol and their research-related duties and functions.

The principal investigator, Dr. Jacqueline M. McGrath who is a supervisor of student research will oversee of student dissertation project from an academic perspective.
The student investigator, Yen-Ju Ho will be responsible for all aspects of the study including participant recruitment, data collection, and analysis. Dr. Jacqueline M. McGrath and Yen-Jo Ho have completed the CITI training (See Appendix 1).

III. CONFLICT OF INTEREST

Describe how the principal investigator and sub/co-investigators might benefit from the subject's participation in this project or completion of the project in general. Do not describe (1) academic recognition such as publications or (2) grant or contract based support of VCU salary commensurate with the professional effort required for the conduct of the project

This study will be the groundwork of the student's dissertation. The investigators will not benefit from subjects' participation in the study or completion of this project.

IV. RESOURCES

Briefly describe the resources committed to this project including: (1) time available to conduct and complete the research, (2) facilities where you will conduct the research, (3 availability of medical or psychological resources that participants might require as a consequence of the research (if applicable), and (4) financial support.

It is planned that this study will be conducted and completed by May, 2010, and take place in Fong-Yuan hospital in Taiwan. The staffs in the Fong-Yuan hospital will not be engaged and not be responsible for any of the research activities. The student investigator is familiar with the setting and has already contacted the facility for gaining access to recruiting study participants, and has concurrently obtained IRB support from the hospital. The study design and questions do not require the need for medical or psychological resources. This study does not have any financial support from any grant.

V. HYPOTHESIS

Briefly state the problem, background, importance of the research, and goals of the proposed project.

Breastfeeding is well recognized as the optimal way to nourish newborns because it is beneficial to both the developing child and the mother. World Health Organization has made the promotion of breastfeeding a primary goal through the development of international standards and policies since 1978 (Dennis, 2002). The breastfeeding goals of the Health People 2010 recommend breastfeeding initiation rates of 75 % and six months breastfeeding rates of 50 % (U. S. Department of Health and Human Services, 2000). Additionally, Health People 2010 objectives updated and continue to support two new objectives related to the initiation and duration of exclusive breastfeeding. These two new objectives are to increase the exclusive breastfeeding rate through age three months to 60 % and through age six months to 25% (U. S. Department of Health and Human Services, 2005). The recent statistics show that the breastfeeding initiation rate for early postpartum period in the United States is 74%, which approaches the Health People 2010 goal, yet breastfeeding rates are only maintained 42 % at the six months. Additionally, rates for exclusive breastfeeding through ages three months and six months are 31 % and 11 %, below targets set by Health People 2010 (Centers for Disease Control and Prevent, 2009).

Similarly, the breastfeeding performance is considered poor in Taiwan. Comparing the 1960s to the 1980s, prevalence of breastfeeding declined significantly. There was a drop in breastfeeding initiation rates from 94.5% in 1960 to exclusive and partial rates of 5.8% and 25% (Chen, Ho, Chen, & Chen, 1989). The Department of Health, Executive Yuan, Taiwan launched national programs to promote breastfeeding in 1992 in Taiwan, including regulation of the marketing of breast milk substitutes by companies making baby formula, development of facilities for breastfeeding in public, breastfeeding counseling and training courses for health workers, mass media programs, and adaptation of Ten Steps to Successful Breastfeeding program to certify Baby-Friendly hospital (Chien, Chu, Tai, & Lin, 2005). The goal of the breastfeeding rate at one month is set at

approximately approach 64 % until 2010. Also, the government encourages the women to perform exclusive breastfeeding until six months postpartum, and continue to breastfeeding (to any degree) until two years (Bureau of Health Promotion, Department of Health, Taiwan, 2005). In more recent studies, the prevalence of breastfeeding has been addressed, and the initiation rate of breastfeeding (to any degree) during the initial hospital stay is 95% among women who delivered in Baby-Friendly hospitals in Taiwan, and 44% at one month postpartum (Gau, 2004). A national survey in 2003 showed that the prevalence of exclusive and partial breastfeeding was 17.9 % and 47 % prior to discharge, 22.3 % and 48.4 % at one month postpartum, and 16.7% and 17.4% at three month postpartum, respectively. The findings indicated that a significant decline of more than 50% was recognized between one and three months. Additionally, the rates of exclusive breastfeeding were still low (Chien, Chu, Tai, & Lin, 2005). Bureau of Health Promotion, Department of Health, Taiwan (2009) reports the rates of exclusive breastfeeding are 29.42 % prior to hospital discharge, 33 % at one month postpartum, 17 % at four months and 13 % at six months in 2004. The breastfeeding rates after hospital discharge are still lower than the policy goals. The results of the studies show the low rates of exclusive breastfeeding and short overall duration of breastfeeding. It remains very challenging for health educators to increase the exclusive breastfeeding and prolong the duration of breastfeeding after hospital discharge in Taiwan.

Despite demonstrated benefits of breastfeeding, breastfeeding prevalence and duration in many countries are still lower than the goals recommended by the departments of health. Some barriers include the negative attitudes of women, husband, and health care professionals toward breastfeeding (Freed, 1993; Kuan et al., 1999; Dungy, 2008). Support from husband, family, and friends has been indicated as important predictors to influence the women's choice and duration of breastfeeding (Raj, & Plichta, 1998; Giugliani, Caiaffa, Vogelhut, Witter, & Perman, 1994; Khoury, Mitra, Hinton, Carothers, & Sheil, 2002). Simmie (2006) examined attitudes toward breastfeeding of Asian and Caucasian mothers. The results indicated that both groups who breastfed had a more positive attitude than those who formula fed. In another study, researchers found that women who received a prenatal web-based breastfeeding education had a higher mean breastfeeding attitude score (Huang et al., 2007). Although some women will choose to perform breastfeeding for a limited amount of time, it has been pointed out that many women have not been successful in breastfeeding for a longer period. Many women who initiate breastfeeding stop very early, between 1 and 4 weeks, because of difficulty in performing and subsequently babies' dissatisfaction. (Matthews, Webber, Mckim, Banoub-Baddour, & Laryea, 1998). Hamlyn, Brooker, Oleinikova, and Wands (2002) reported that 87% of women who stopped breastfeeding within the first six weeks would have liked to breastfeed for a longer period. For those women who breastfed for at least six weeks, 37 % would have preferred to continue for a longer period. Reasons for discontinuing to breastfeed varied with the duration of breastfeeding. Baby rejecting the breast and painful nipples were the common reasons for cessation in the early weeks. In later weeks, up to about four months, mothers perceiving that they had insufficient milk were the most important reason. In later months, returning to work was the major reason for mothers reducing breastfeeding.

Although breastfeeding is a common practice in Taiwan, the exclusive breastfeeding rate is very low. Maternal positive breastfeeding attitudes are associated with continue to be breastfeeding at first month postpartum (Chen & Chi, 2003). Several reasons have been linked to the low percentage rate of breastfeeding, including little support from the family of postpartum women and few consulting resources for breastfeeding in the community, facilities and policies in medical institutions and working places that are unfavorable to breastfeeding (Ko, 2002). The researches done to date related to the mothers' attitudes toward breastfeeding have not been sufficiently examined by using a validated attitude instrument in Taiwan. Therefore, clearly there is a need to understand mothers' breastfeeding attitudes in order to decide what interventions might be the most important in helping women continue to breastfeed. The purpose of this study is to investigate maternal breastfeeding attitudes, and follow up the mothers' behavior in the duration of breastfeeding at first six weeks postpartum, using a previously validated instrument. Also, It is hypothesized that positive maternal attitudes as measured by the Iowa Infant Feeding Attitude Scale, would positively influence mothers' choice among feeding methods with a greater propensity to increase the duration of exclusive breastfeeding.

VI. SPECIFIC AIMS

The proposed study will attempt to answer the following questions to contribute to the knowledge for prolonging continuation of breastfeeding in Taiwan:

1. To what extent are maternal attitudes and socio-demographic variables associated with the continuation of breastfeeding through the first six weeks postpartum?
2. What are the reasons for mothers to cease breastfeeding and their perceived social support at the first six weeks postpartum?
3. What is the reliability and validity of the Chinese version of the Iowa Infant Feeding Attitude Scale (Da La Mora et al., 1999) among the Chinese population in Taiwan?

VII. BACKGROUND AND SIGNIFICANCE

Include information regarding pre-clinical and early human studies. Attach appropriate citations.

Framework of this study

The benefits of breastfeeding for mothers and their infants are well documented, but breastfeeding duration rate in United States and Taiwan remain low over the past decade. The initiation and continuation of breastfeeding can be influenced by socio-demographic characteristics, social support, and the maternal attitudes (Hamlyn, et al, 2002; Blyth, et al., 2004).

The theory of planned behavior (Ajzen & Madden, 1986; Ajzen, 1991) has emerged as one of the most influential and popular conceptual framework for the study of human behavior (Ajzen, 2001). A number of researchers have begun to rely on the theory of planned behavior in their attempts to predict and understand people's intentions to engage in various behaviors (Ajzen, 1991). Dodgson, Henly, and Tarrant (2003) applied the theory of planned behavior to evaluate cross-cultural application of this theory for breastfeeding duration among new mothers in Hong Kong. Rempel (2004) used the theory of planned theory to examine the intended and actual breastfeeding duration of 80 women who were breastfeeding 9-month-old infants.

The theory of planned behavior assumes that behavior is a function of salient information or belief, relevant to the behavior. These salient beliefs are considered to be the prevailing determinants of people's intentions and actions. Three types of salient beliefs are described: behavioral beliefs which assume the influence attitudes toward the behavior, normative beliefs which form basic determinants of subjective norm, and control beliefs which are the foundation of perceptive behavioral control. Attitude toward the behavior, subjective norm, and perceived behavioral control are assumed to be three independent determinants of a behavioral intention. The attitude toward behavior expresses the degree to which an individual has a favorable or unfavorable evaluation of the behavior in question. Subjective norm expresses the individual perceived social pressure compelling one to perform or not to perform the behavior. The perceived behavioral control expresses the individual perceived ease or difficulty of doing the behavior and it is presumed to reflect past experiences as well as expected barriers and obstacles. Generally, the more positive the attitude and subjective norm are, and the greater the perceived behavioral control is, the more likely a person will have stronger intentions to perform the behavior under consideration (Ajzen, 1991; Ajzen, 2001). The relative importance of attitude, subjective norm, and perceived behavior control in the prediction of intentions is thought to be different across behaviors and situations. Therefore, in some conditions, it could be found that only attitudes have an important impact on intentions, in others attitudes and perceived behavioral control need to be considered for their effect on intentions, and in still others all three determinants have independent contributions that need to be considered (Ajzen, 1991).

Intentions, attitude toward the behavior, subjective norm, and perception of behavioral control each

displays a different part of the behavior, and each can offer a different point at which to intervene and change the behavior (Ajzen, 1991). Moreover, the theory of planned behavior also specifies a link between beliefs and attitudes, depending on the expectancy-value model. According to this model, people's evaluations of attitudes toward behaviors are determined by their accessible beliefs about the behavior, where a belief means that the subjective probability that the behavior will cause a certain outcome. According to the expectancy-value model, people's overall attitudes toward behaviors are determined by the subjective values of the outcomes associated with behaviors and by the strength of these associations. That is to say, the evaluation of each outcome provides the attitude in direct proportion to a person's subjective probability that the behavior causes the outcome in question (Fishbein & Ajzen, 1975; Fishbein, 1963).

The influence of attitude toward behaviors, subjective norm and sociodemographic factors on breastfeeding outcomes is of interest in this research. The attitude variable is the maternal attitudes toward breastfeeding. The subjective norm variable refers to the degree to which women believe that significant others support of their breastfeeding. Additionally, although a large number of researchers report the sociodemographic variables influencing breastfeeding behaviors, little is known about how these factors change mothers' infant feeding choices in Taiwan. Therefore, socio-demographic variables will be examined in this study. Figure 1 illustrates the theoretical model developed to explore the relationship between women's attitude toward breastfeeding, social support, sociodemographic factors, and breastfeeding outcome.

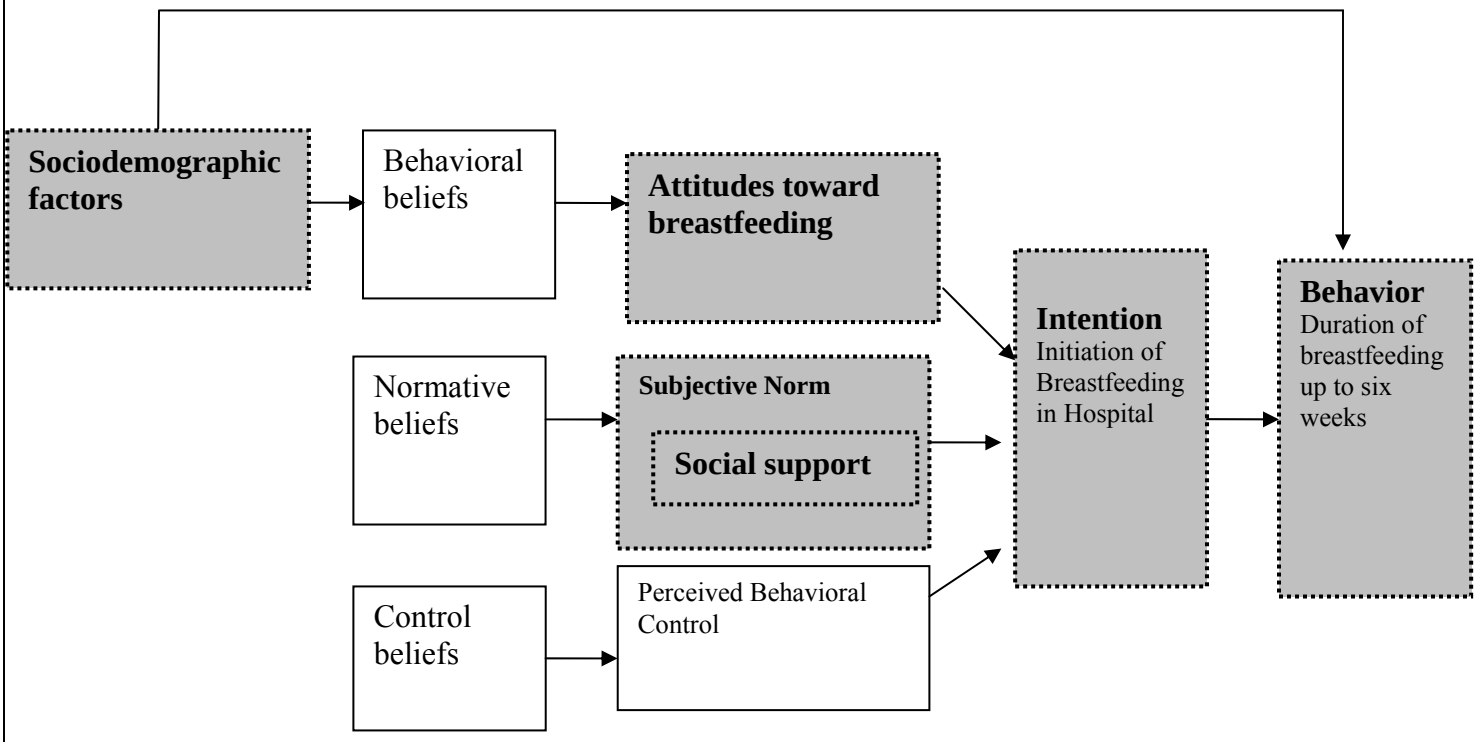

Figure 1. A modification of the theory of planned behavior model for breastfeeding intention (Ajzen, 1991).

The development and application of the Iowa Infant Feeding Attitude Scale (IIFAS)

The Iowa Infant Feeding Attitude Scale (IIFAS) (De La Mora et al., 1999), a simple, easily administered instrument. It was developed over the course of three independent studies involving 980 postpartum women prior to hospital discharge to measure maternal attitudes toward infant feeding.

De La Mora et al. (1999) conducted a preliminary testing of this IIFAS scale at a 456-bed community hospital located in a midwestern city for their study 1. A total of 125 women who delivered their infant within 48 hours at hospital completed questionnaires. Women were asked how they planned to feed their infants after leaving the hospital. 59 % of women indicated that they had the plan on performing at least some breast-feeding, whereas other women (41%) planned to do the exclusive formula feeding for their infant. The findings in this study 1 showed that the 17 items of the Iowa Infant Feeding Attitude Scale (IIFAS) had high level of internal consistency (α=.86), and married women had more positive attitude than did single women ($p < .01$). Statistically significant correlations ($p < .01$) were found between maternal attitudes toward infant feeding and women age (r=.33), education (r=.29), and family income (r=.27). Also the multiple regression analysis showed demographic factors as predictors of infant-feeding attitudes accounted for 19 % of the variation in maternal attitudes, which reached statistically significant ($p < .01$). These results indicated that women who were married and of higher SES were more likely to favor breastfeeding. Furthermore, the researchers used the hierarchical regression analysis, the dependent variable was infant feeding method, and found that the demographic variables (number of births, maternal education, maternal employment, family income, marital status, maternal age, and religion) were significant predictors of feeding method ($R^{2=}.25$, $p < .01$). Attitude toward infant feeding was also a significant predictor of choice of feeding method ($p < .001$), after controlling for the influence of the demographic variables.

Later, De La Mora et al. (1999) conducted the study 2 at the same hospital as in study 1 to investigate if there was any reduction in the reliability and validity of the IIFAS. A total of 130 new mothers completed the 17 items of IIFAS, and mothers were asked how they planned to feed their babies after discharge from hospital. The findings of this study 2 indicated that consistent with the results of study 1, the IIFAS was highly reliable (α= .85). As the same in study 1, the IIFAS showed construct validity because it is predictive of the type of infant feeding chosen by the women. From the results, women who planned to do breastfeeding had more positive attitudes toward that method of infant feeding (M=65.61, SD=8.38) than did women who planned to do formula feeding (M=50.02, SD=7.21) ($p < .01$) (De La Mora et al., 1999). In this study 2, De La Mora et al. (1999) found that only one of demographic variables was significantly correlated with feeding attitudes was maternal age (r=.23). Also, the researchers used the hierarchical regression analysis, and found the demographic variables (number of births, maternal education, maternal employment, family income, marital status, maternal age, and religion) were significant predictors of feeding method (R^2=.15, $p < .05$). Furthermore, attitude toward breastfeeding was indicated to be a significant predictor of choice of feeding type, after controlling for the influence of the demographic variables ($p < .001$).

The researchers conducted the study 3 at the same hospital as in studies 1 and studies 2 to investigate if scores of IIFAS were predictive of actual behavior by examining the relationship between maternal attitude scores and the duration of breastfeeding among women who have chosen breastfeeding for their infants at

hospital stay. The sample included 763 women who had initiated breastfeeding of their infants, and completed the 17 items of IIFAS while in the hospital. Then telephone interviews were conducted with the women every 2 weeks for the first 16 weeks postpartum to follow up how the women were feeding their infants. 5% of the women (n=38) were lost to monitor because of attrition. Finally, there are total 725 women for the following data analysis in study 3.

The findings in this study 3 by De La Mora et al. (1999) showed the average duration of exclusive breastfeeding was 6.5 weeks, and the average of duration of partial breastfeeding was 10 weeks. Maternal age (r=.13) and family income (r=.09) were found to be significantly correlated with the scores of IIFAS. Women who planned to stay at home were more positive attitudes than did women who planned to come back to work ($p < .01$). Demographic variables accounted for 4% of the variation in attitudes as a result of the multiple regression analysis. Family income and whether or not the women planned to come back to work were the variables that were statistically significant. The researchers also conducted a hierarchical regression analysis to assess if attitudes toward feeding method predicted duration of breastfeeding over and above the influence of the demographic variables. The duration of exclusive or partial breastfeeding over the 16-week was the dependent variable. The findings of this analysis indicated that being married and being older were related to a longer duration of exclusive breastfeeding, whereas planning to come back to work, having first child were related to a shorter duration of exclusive breastfeeding. Attitudes toward choice of infant feeding were a significant predictor of duration of exclusive breastfeeding after controlling for the influence of the demographic factors.

De La Mora et al. (1999) indicated that the IIFAS was applicable to a wide variety of populations, and researchers were encourage to use this scale in their studies, and to keep the developers informed as to their findings, so that continued improvements in the measure may happen.

Studies using the IIFAS in the United States (Marrone et al., 2008; Simmie, 2006), Australia (Giglia et al., 2007; Scott et al., 2006), Northern Ireland (Sittlington et al., 2007) and Scotland (Scott et al., 2004; Dungy et al., 2008; Tappin et al., 2006; Shaker et al., 2004) have reported strong predictive validity and internal consistency with alphas ranging from 0.79 in Scotland (Shaker et al., 2004) and Northern Ireland (Sittlington et al., 2007) to 0.86 in the United States (De La Mora et al., 1999). The IIFAs also was translated into Romania version and internal consistency was adequate in the study (antenatal α=.50; maternity α=.63). Yet, the IIFAS has not been used in Asia countries. Also, it has not been previously translated into Chinese and use with Chinese population.

Reasons for Breastfeeding Cessation

Many women do not continue to breastfeed past the early months. Several reasons have been identified for breastfeeding cessation (Schwartz et al., 2002; Chen & Chi, 2003; Ahluwalis, Morrow, & Hsia, 2005; O'Brien, Fallon, Brodribb, & Hegney, 2007). A number of breastfeeding problems can be managed easily and do not necessarily result in breastfeeding cessation (Binns & Scott, 2002; Giugliani, 2004).

Schwartz et al. (2002) conducted a prospective cohort study of 946 breastfeeding women who were interviewed by telephone at 3, 6, 9, and 12 weeks postpartum or until breastfeeding cessation in Michigan and Nebraska. A particular aim of the study was to investigate breastfeeding patterns associated with breastfeeding cessation in the first 12 weeks postpartum. Participants who had ceased breastfeeding in the first 3 weeks were given an open-ended question to answer when and why breastfeeding stopped. Subjects could provide multiple reasons for breastfeeding termination.

In this study by Schwartz et al. (2002), a total of 946 women participated, and 75% of the women continued to breastfeed until 12 weeks. Women who were older than 30 years and women who had at least a bachelor's degree were more likely to continue breastfeeding in any given week. The most common reasons given for breastfeeding cessation in the first 3 weeks are insufficient milk supply (37.3%) and breast pain or mastitis (32.9%). Insufficient milk supply (35.0%) was the reason most often given at weeks 4 through 6. Return to works was the most common reason given for stopping breastfeeding at both weeks 9 and 12 (53.1% and 58.3%, respectively).

Chen and Chi (2003) conducted a study in Taiwan to examine the factors that influenced maternal breastfeeding behavior and the reasons to cessation breastfeeding. A total of 591 women completed both the first questionnaire within 24 hour after delivery and a follow-up questionnaire at one month postpartum. The women were asked to choose the reasons of weaning or to fill out the reasons if they were not listed when the women ceased breastfeeding. The average age of breastfeeding women was 31±4.1 years. 37 (6.2%) women had nine or less than nine years of education, 191 (32.4%) women had cesarean section for delivery, and 324 (54.8%) women were multiparous, of whom 68.7% had previous breastfeeding experience. Among the study participants, 428 (72.4%) chose exclusive breastfeeding, 85 (14.4%) chose mixed feeding, 63 (10.7%) chose formula feeding, and 15 (2.5%) were undecided within 24 hours after delivery. The total breastfeeding rate, both exclusive breastfeeding and mixed feeding, decreased from 83.4% at hospital stay to 50.8% at one month postpartum.

Chen and Chi (2003) founded that nine percent of the breast feeder weaned within the first week, 9.2% weaned between the first and second week, 8.4% weaned during weeks 2 through 3, and 14.8% weaned during weeks 3 through 4. "Milk insufficiency" was the most common reason given for weaning within 1 week (38.3%), between the 1st and 2nd (50.0%), between 2nd and 3rd (46.4%), and between 3rd and 4th (42.1%). "Back to work" became a reason for breastfeeding cessation between 3rd and 4th (30.5%). Overall, "milk insufficiency" (43.8%), "maternal tiredness" (36.2%), "not knowing if infant had enough to eat" (32.8%), and "breast problems" (28.3%) were the four major reasons for weaning in the first month postpartum.

Factors associated with the breastfeeding

Researchers have focused on identifying factors that may affect the continuation of breastfeeding. Successful breastfeeding is dependent on multiple factors associating with mother, infant and supportive environment. The factors can be separated into two groups, including non-modifiable and modifiable (Scott & Binns, 1999; Blyth et al., 2004). In this study, at the individual aspect, non-modifiable factors include age, education, marital status, family income, employment status, parity, previous breastfeeding experiences, and method of delivery. Potential modifiable factors relate to maternal attitudes toward breastfeeding and mothers' perceived support.

A study was conducted by Chang and Chan (2003) in Taiwan to evaluate factors influencing the initiation and duration of breastfeeding. They contact women whose child was aged from one month to two years old. A total of 251 completed the questionnaires. Most of the women (81.7%) initiated breastfeeding after birth, but only 20.7% continued breastfeeding for at least four months postpartum. The results indicated that perceiving the approval of breastfeeding by the baby's father or parents- in-law and assistance from healthcare stuff were positively associated with initiation of breastfeeding. Also, women who were employed and those with a higher level education were less likely to perform breastfeeding equal or more than four months. Women who were younger among infants ≧four months old at the time of this study were less likely to breastfeed at least four months. The father's approval attitude was positively related with continuation of breastfeeding.

A study was conducted by Heck, Braveman, Cubbin, Chavez, and Kiely (2006) to investigate the socioeconomic status that influenced the breastfeeding among a stratified random sample of 10519 women who delivered live births in California. They found that 87.8% of women had ever breastfed their infants at least once. Women who had the cesarean section, low birthweight infants, or multiple births were all more likely never to breastfeed. Women who had a third or later child were more likely never to breastfeed than lower-parity women. Women with a lower education level and an unemployed status were more likely never to breastfeed their infants. Younger women and those who were unmarried were more likely never to breastfeed their infants. Women with higher family income were likely to breastfeed. Maternal education was positively related to breastfeeding.

Shaker, Scott and Reid (2004) compared the infant feeding attitudes of parents of breastfed infants with the attitudes of parents of formula fed infants at discharge by using Iowa Infant Feeding Attitude Scale (IIFAS). Pregnant women (gestational age 8-12 weeks) attending three maternity clinics in Scotland were recruited. A total of 108 couples completed the survey by face-to-face interview and the method of infant feeding at

discharge from hospital was obtained from their medical records. They found that there was a strong correlation between maternal intentions and actual infant feeding behaviors ($p < 0.001$). The breastfeeding women had a significantly higher total attitude score to prefer breastfeeding than those who chose to formula feed did ($p < 0.001$). Also, the fathers of breastfed infants had a significantly higher total attitude score to prefer breastfeeding when compared with fathers of formula fed infants ($p < 0.001$).

In summary, Maternal attitude is a concept of interest to health professionals who work with breastfeeding. As revealed by the literature review, the theory of planned behavior indicated that a person's attitude has an important influence on a person's intention. Maternal attitudes are positively associated with the duration of breastfeeding. Thus, A modification of the theory of planned behavior is used as the conceptual framework in this study for investigation of maternal attitudes and actual behavior related to breastfeeding duration. Furthermore, the literature on early weaning has focused on reasons for ceasing breastfeeding and women's perceived social support. Moreover, the previous studies in Taiwan did not use a reliable and valid tool to measure maternal attitudes toward breastfeeding. From the above literature review, there is a need to validate a measure of infant feeding attitudes in Taiwan, and to understand the reasons about breastfeeding cessation and women's perceived social support in breastfeeding. And further investigation is needed to better understand women's breastfeeding attitudes and socio-demographic factors associated with the duration of breastfeeding in Taiwan, which has a unique pattern of cultural and socioeconomic conditions compared with the western countries.

VIII. Preliminary Progress/Data Report

If available.

N/A

IX. Research Method and Design

Include a brief description of the project design including the setting in which the research will be conducted and procedures. If applicable, include a description of procedures being performed already for diagnostic or treatment purposes.

Design

The study is a longitudinal design to assess the response variable of breastfeeding status and the predictor variables of the maternal attitudes toward breastfeeding along with socio-demographic factors. This study will be conducted in one public hospital in Taiwan. A face-to-face interview with each mother is conducted before discharge to collect the socio-demographic data and to administer the IIFAS questionnaire. Breastfeeding status is collected by telephone at three-week intervals to record the status of breastfeeding. In the final follow up at either six weeks or when breastfeeding is discontinued, mothers are asked during the phone interviews to provide their reasons for breastfeeding cessation and their perceived social support.

Definition of Study Variables

For this study, infant feeding behavior is operationally defined as exclusive breastfeeding, partial breastfeeding, and bottle feeding. The definition of exclusive breastfeeding is that infant receives only human milk, with no formula milk used. If mothers pump the milk and deliver it by bottle, and it will not be considered as breastfeeding. Partial breastfeeding is defined as infant receives human milk and bottle feeding with formula

milk. Bottle feeding is defined as infant receives formula milk from a bottle. For the statistical analysis, the breastfeeding group will include the exclusive breastfeeding and partial breastfeeding. Breastfeeding duration is defined as the total number of days from the beginning to end of breastfeeding, and is recorded with a maximum of 42 days. Duration of breastfeeding data is obtained by phone calls to the women every three-week until six weeks postpartum. Women are asked how they are feeding their baby at home, and classified as exclusive breastfeeding, partial breastfeeding, or bottle feeding. Weaning is defined as "ceased breastfeeding and do not intend to breastfeeding again." The "Breastfeeding Attitude" variable is defined as the degree of positive or negative value placed on breastfeeding (Ajzen, 1988). The maternal breastfeeding attitudes are measured using The Iowa Infant Feeding Attitude Scale (Da La Mora et al., 1999). The instrument is a 17-item questionnaire administered to the mothers during the hospital stay. Socio-demographic characteristics are age, education, marital status, family income, employment status, parity, previous breastfeeding experiences, and method of delivery, as reported by the mothers.

These eight socio-demographic variables are known predictors of breastfeeding behavior (Dennis, 2002). Thus these items are important to assess and will be used to consider their influence as potential confounding variables on the continuation of breastfeeding. Maternal age will be collected as a continuous data. Maternal education is categorized as senior high school or lower, college, university, or graduate or above. Maternal marital status is categorized as married, divorced or separated, or single. Family annual income refers to the total parental income per year, and it is divided into four categories in new Taiwan dollars (NTD= New Taiwan Dollars, US$ 1=NT$ 32 in 2010): below 400,000, 400,000-600,000, 600,001-1,000,000, or more than 1,000,000. Maternal employment status is categorized as mothers returning to work after maternity leave, or they do not work. Maternal parity is categorized as first birth, second birth, third or higher birth. Baby sex is categorized as female baby or male baby. Maternal previous breastfeeding is categorized as yes, or no. The previous breastfeeding experience is categorized as good or not good. Method of delivery is categorized as cesarean section or vaginal delivery. Each demographic variable is placed at the end of the survey in order to minimize subject burden, preserve privacy, and to reduce risk of bias as much as possible.

Instrument

The instrument used for collection of data in this study is the Iowa Infant Feeding Attitude Scale (IIFAS) (See Appendix2). The Iowa Infant Feeding Attitudes Scale (IIFAS) was developed to measure attitudes toward infant feeding. The IIFAS can be used by researchers and health professionals to assess women's attitudes toward breastfeeding. Also, the IIFAS can be used to predict the choice of infant feeding method when reflected by measures of behavioral intentions; and to predict the actual feeding behavior when reflected by the duration of breastfeeding, and its predictive validity shows independent of socio-demographic variables (De La Mora et al., 1999). It consists of 17 items with a 5-point Likert scale ranging from 1 (strongly disagree) to 5(strongly agree). Nine of the items are worded in a manner favorable to breastfeeding, and the remaining favorable to formula feeding. Items favoring formula feeding are reverse scored (i.e., 1=5, 2=4, 4=2, and 5=1), and a total of attitude score is computed via an equally weighted sum of responses to the individual items. Total attitude scores could range from 17 (indicating positive formula feeding attitudes) to a high of 85 (reflecting positive attitudes toward breastfeeding).

The Iowa Infant Feeding Attitudes Scale (IIFAS) was originally developed by De La Mora et al. (1999). Six articles were found on the IIFAS that included description of the psychometric characteristics (De La Mora et al., 1999; Scott et al., 2004; Tappin et al., 2006; Sittlington et al., 2007; Dungy et al., 2008; Wallis et al., 2008). Reliability was moderate to high on the IIFAS. Reliability was tested with Cronbach alpha measures for this tool. This tool has been tested with a variety of populations. De La Mora et al. (1999) conducted three studies to test the psychometric properties of the IIFAS. They tested IIFAS in postpartum women within 48 hours of the births of their infants in study 1 (n=125) and study 2 (n=130). In study 3, they chose 130 women who had initiated breastfeeding at hospital and then followed up at 16 weeks postpartum. Cranbach alpha coefficient was 0.86; all corrected item-total correlations were positive and significant, and ranged from 0.22 to 0.68 in study 1.

Cranbach alpha coefficient was 0.85; all corrected item-total correlations were positive and significant, and ranged from 0.23 to 0.69 in study 2. Cranbach alpha coefficient was 0.68; all corrected item-total correlations were positive and significant, and ranged from 0.07 to 0.45 in study 3 (De La Mora et al., 1999). The IIFAS also was tested in pregnant women (gestational age 8-12 weeks) and their partners in Scotland (n=108 couples). Cranbach alpha coefficient was 0.79 for mothers and was 0.77 for fathers (Scott et al., 2004). The IIFAS was tested in 146 health visitors in Scotland (Tappin et al., 2006), and it was tested in 192 pregnant women (gestational age 8-12 weeks) in Northern Ireland (Sittlington et al., 2007). Cranbach alpha coefficients were 0.79 in these two studies (Tappin et al., 2006; Sittlington et al., 2007). In additional, the IIFAS was tested in low-income pregnant women and their social networkers in Scotland (n=49 pregnant women; n=47 social networker). Cranbach alpha coefficient was 0.74 for mothers and was 0.89 for social networkers (Dungy et al., 2008). Moreover, the IIFAS was translated into Romanian version and tested in pregnant women attending the clinic (n=336), mothers within 24 hours of delivery (n=276) and postpartum women who initiated breastfeeding in the hospital (n=52). Cranbach alpha was 0.50 for the antenatal groups and was 0.63 for the maternity groups (Wallis et al., 2008).

The IIFAS has not been previously translated for use in Taiwan and China. For use in this study, a systematic process recommended by Beaton et al. (2002) (See Appendix 11) was used for translating of the tool. The process was outlined below.

(1). Initial Translation:

The first stage was the forward translation. Forward translation of the IIFAS was conducted by two bilingual translators to produce the instrument from the source language (English) into the target language (Chinese). These two bilingual translators have the target language as their mother tongue. The two translators have different backgrounds to establish the best possible translation. One of the translators (See Appendix 8 for his resume) is knowledgeable about the type of concepts the questionnaire in order to aim at equivalence from a more clinical perspective, and may produce a translation that is more reliable equivalence to the original from a measurement perspective. The other translator neither be aware nor be informed of the concepts being translated, and have no medical/clinical background. This "naïve translator" is more likely to detect the more subtle differences in meaning of the original than the first translator, and to reflect the language used by the common population (Guillemin, 1993). A synthesis of the two translations will be produced, resulting in one common translation.

(2) Synthesis of these translations

A synthesis of the two translations was produced by the student investigator. In this step, the student investigator served as a mediator in discussion the differences between the first translator's version (T1) and the second translator's version (T2), and produced a written documentation of the process, resulting in one common translation (T-12).

(3) Back-Translation:

Three bilingual translators worked from the T-12 version of the questionnaire, and totally blinded to the original English version, the questionnaire was then translated back into the original language. This process was a validity checking to make sure the translated version accurately reflects the items content of the original version. Back translation is only one type of validity checking, and is the best at highlighting gross inconsistencies or conceptual errors in the translation process (Beaton et al., 2002). The back-translations (BT1 and BT2) were produced by two bilingual people who are American with the source language (English) as their mother tongue. And another one is a Chinese American (BT3). These translators neither are aware nor are informed of the concepts explored in order to avoid information bias and to elicit unexpected meaning of the items in the translated questionnaire (Guillemin, 1993). The non-professional translators are to ensure language commonly understood by the Chinese-speaker mothers.

(4) Synthesis of these back- translated version

A synthesis of these three translations also was produced by the student investigator. In this step, the student investigator worked to be a mediator to examine the differences among these three back-translated versions, and

produced a written documentation of the process, resulting in one common translation (BT-123).

(5) Equivalence testing

Semantic equivalence and content equivalence that are two major dimensions of cross-culture equivalences are tested.

(a) Semantic equivalence

Semantic equivalence means that the meaning of each item is the same in each culture after translation into the target language (Flaherty, et al., 1988). The back-translation is the key to establish semantic equivalence. An innovative method developed by Skperber, DeVellis and Boehlecke (1994) was used in the Chinese version of IIFAS for establish semantic equivalence and validating the translated instrument. Each item in the original and back-translated versions was ranked in terms of comparability of language and similarity of interpretability (See Appendix 3). Comparability of language refers to the formal similarity of words, phrases, and sentences. Similarity of interpretability refers to the degree to which the two versions engender the same response even though the wording is not the same. Likert scales ranging from 1 (extremely comparable/extremely similar) to 7 (not at all comparable/not at all similar) were used by raters who are fluent in the source language. Any mean score>3 requires a formal review of the translation, and mean score between 2.5 and 3 in the interpretability column is also considered problematic and is reviewed for possible correction. If the item has a poor mean score, it will be revised and the revised item is back-translated until the mean scores indicated a valid version. This process enable the researchers to identify potentially problematic items and reassess and retranslate them until the researchers are as confident as possible that these items will be interpreted in the same manner in both language. Three native English speakers who are doctoral students were asked to participant in this process to rate their agreement independently between the original version and back-translated version of IIFAS. As a result, all items were rated less than score 3 in terms of comparability of language and similarity of interpretability. No modifications to items were indicated.

(b) Content equivalence

Content equivalence means that each item's content on the tool is relevant in each culture being studied (Flaherty et al., 1988). If the content validity has been established in the original culture, the translated instrument needs to be reexamined each item's relevance in the second culture. The translated IIFAS was established the content equivalence of each item using the content validity index (CVI) by three content experts in Taiwan (See Appendix 4). All of them are faculty in Taiwan and are women health and breastfeeding experts. Two of them have the doctorate in nursing. The CVI was used to quantify the extent of agreement between the three experts. These three experts were asked to rate the items using the CVI, and were also asked for suggestions about how to improve the items. They rated the cultural relevancy of each item in measuring the construct of breastfeeding attitudes in Chinese people. A 4 point rating scale, where 1= a not relevant item, 2= a somewhat relevant item, 3=a quite relevant item, and 4 = a very relevant item, was used. The CVI was calculated according to the proportion of items given a rating of 3 and 4 (quite/very relevant) by all experts involved. If all items are given ratings of 3 or 4 by all experts, the value of the CVI will be 1.00. A CVI that is equal to or higher than 0.8 indicates that the translated instrument has high content validity (Waltz, Strickland, & Lenz, 1991). The CVI of this Chinese IIFAS is 1.00. No item was rated by these three experts as either 1 (not relevant) or 2 (somewhat relevant). One of the experts indicated that question 5 (Formula-fed babies are more likely to be overfed than are breast-fed babies.) is similar to question 10 (Breast-fed babies are more likely to be overfed than formula-fed babies.), and choose either one of the questions is enough. The researchers think that the questionnaire is assumed to measures the same concept from different perspective, so these two questions still keep in this questionnaire to evaluate maternal attitudes toward breastfeeding.

(6) Test of the pre-final version:

The final stage of the process was the pretest by using the pre-final version with subjects from a target setting. Each subject completed the questionnaire, and was then interviewed to explore what they thought about each item and their response. Beaton et al. (2002) indicated that this stage does provides some useful insight into how an individual person interprets the items and some measure of quality in the content validity, but it does not

address the construct validity, reliability or item response patterns. Additional testing for the retention of the psychometric properties of the questionnaire is highly recommended for researchers, however not required for approval of the translated version. In this stage, this questionnaire was pretested with 10 women who ever breastfeeding to evaluate participants' understanding and readability of each item of the IIFAS Chinese version. The results showed that only one item required attention. The item "A mother who occasionally drinks alcohol should not breast-feed her baby" was modified to "A mother who drinks alcohol once a week should not breast-feed her baby". In this study, the "occasionally" is defined as "once a week". Finally, the final version of the translated IIFAS incorporated 17 items with one requiring minor modifications (See Appendix 5).

We have used the same process to translate the cover letter (See Appendix 6) and the interview form including open-ended questions (See Appendix7) for phone calls. One health professional (See Appendix 8 for his resume) translated the cover letter and the interview form from English to Chinese. Then these Chinese versions were back-translated to English by a bilingual Chinese. These two English versions of cover letter and interview form were compared by an American. Then, the readability of the Chinese versions of cover letter and interview form was reviewed by three women who have ever breastfed.

X. PLAN FOR CONTROL OF INVESTIGATIONAL DRUGS (If the VCUHS Investigational Drug Pharmacy is not used), DEVICES, AND BIOLOGICS

Describe your plans for the control of investigational products including: (1) how you will maintain records of the product's delivery to the trial site, the inventory at the site, the use by each subject, and the return to the sponsor or alternative disposition of unused product(s); (2) plan for storing the investigational product(s) as specified by the sponsor (if any) and in accordance with applicable regulatory requirements; (3) plan for ensuring that the investigational product(s) are used only in accordance with the approved protocol; and (4) how you will ensure that each subject understands the correct use of the investigational product(s) (if applicable) and check that each subject is following the instructions properly (on an ongoing basis).

N/A

XI. DATA ANALYSIS PLAN

For investigator–initiated studies.

An overview of data analysis that is used in this study is presented. Data is analyzed both quantitatively and qualitatively. The SPSS version 17 for Windows statistical software program will be used for quantitative data analysis. All data will be reviewed and examined for coding errors or missing data. Missing data will be handled by using the exclude cases pairwise. Descriptive statistics will be examined first for feeding groups including distribution, frequencies, and means. Any outlier or unusual values will be examined prior to data analysis. A scatterplot will be used to check for outliers. The relationship between methods of feeding and demographic variables such as age, education, marital status, family income, employment status, parity, baby sex, previous breastfeeding, previous breastfeeding experience and method of delivery will be tested by using t-tests for continuous data and chi-square tests for categorical data. Mean scores, standard deviations, and ranges will be reported for the instrument and each item of the questionnaire in the study. The significance level for all statistical analysis is set at 0.05. The statistical assumption testing is conducted for each of the statistical procedure. The qualitative data is obtained from the open-ended questions related to mothers' reasons for changing feeding method form breastfeeding to bottle-feeding and their perceived social support.

The following statistical analysis will be used for every research question:

1. To what extent are maternal attitudes and socio-demographic variables associated with the continuation of breastfeeding through the first six weeks postpartum?

Determinants of breastfeeding duration are investigated in the regression analysis using Cox's proportional hazards model. The model allows joint estimation of the effects of predictor variables on the "hazard", the risk of the breastfeeding cessation, rather than the duration itself, and can be used to analyze data containing censored observations (Cox & Oakes, 1984). The censored data means data from mothers who continue to breastfeed beyond the end the study period or beyond the time at which mothers drop out from the study. The breastfeeding data are designed to decide the status of breastfeeding (exclusive breastfeeding, partial breastfeeding, or bottle feeding) at a three-week interval. The question is "Are you still breastfeeding?"

Variables reported in literature to have an effect on the duration of breastfeeding are selected as possible determinants. They are maternal attitudes toward breastfeeding, age, education, marital status, family income, employment status, parity, baby sex, previous breastfeeding, previous breastfeeding experience, and method of delivery. These determinants in this study are predictor variables, and the outcome variable is the status of breastfeeding (if mothers cease breastfeeding or not).

2. What are the reasons for mothers to cease breastfeeding and their perceived social support at the first six weeks postpartum?

The qualitative data are obtained from the open-end question related to mothers' reasons for ceasing breastfeeding. If the mothers change feeding method from breastfeeding to bottle feeding, they are asked an open-ended question to provide the reason regarding weaning. The question is "what are the reasons you choose to stop breastfeeding?" They also are asked two open-ended questions about the support they received: "as you look back over the time you have breastfeed, who have been supportive to you since baby's birth?" (such as family or friends) and "what type of support you received?" (such as encouragement or caregiving help). Content analysis is used to identify prominent themes and categories. The categories are then coded and ranked in order of frequency to determine the most common reasons for maternal cessation of breastfeeding.

3. What is the reliability and validity of the Chinese version of the Iowa Infant Feeding Attitude Scale (Da La Mora et al., 1999) among the Chinese population in Taiwan?

After pretest, the final version of the translated IIFAS will be used to measure maternal attitudes toward breastfeeding. To establish technical equivalence, the translated IIFAS will be administered by using the paper and pencil method to collect data from hospitalized women after birth, a technique consistent with the original methodological study. In the data analysis, the reliability of the translated IIFAS is evaluated by using the cronbach's alpha coefficient and corrected item-total correlation. Validity will be assessed by examining predict validity. Predict validity will be determined through the examination of participants' IIFAS scores and infant feeding method at 6 weeks postpartum by using t-test to evaluate if there is a significant difference between breastfeeding group and bottle-feeding group.

XII. Data and Safety Monitoring

- **If the research involves greater than minimal risk and there is no provision made for data and safety monitoring by any sponsor, include a data and safety-monitoring plan that is suitable for the level of risk to be faced by subjects and the nature of the research involved.**
- **If the research involves greater than minimal risk, and there is a provision made for data and safety monitoring by any sponsor, describe the sponsor's plan.**
- **If you are serving as a Sponsor-Investigator, identify the Contract Research Organization (CRO) that you will be using and describe the provisions made for data and safety monitoring by the CRO. Guidance on additional requirements for Sponsor-Investigators is available at http://www.research.vcu.edu/irb/wpp/flash/wpp_guide.htm#X-2.htm**

This study involves no more than minimal risk to subjects. All surveys are numbered, no names are used. Anonymity is ensured by assigning each subject an identification number. All material associated with the study will be stored in a locked location in the investigator's home office. Data are kept in a secured, locked cabinet.

Identifying information is stored separated from the survey data in another locked storage cabinet. Study information is only available to the PI and student investigator. Dr. McGrath will serve as the PI for the VCU IRB purpose, and will assume accountability for human subject protection. Data will be entered on to password protected laptop, in a password protected file.

XIII. MULTI-CENTER STUDIES

If VCU is the lead site in a multi-center project or the VCU PI is the lead investigator in a multi-center project, describe the plan for management of information that may be relevant to the protection of subjects, such as reporting of unexpected problems, project modifications, and interim results.

N/A

XIV. INVOLVEMENT OF NON-VCU INSTITUTIONS/SITES (DOMESTIC AND FOREIGN)

1. **Provide the following information for each non-VCU institution/site (domestic and foreign) that has agreed to participate:**
   - **Name of institution/site**
   - **Contact information for institution/site**

Fong-Yuan Hospital Department Of Health Executive Yuan,Taiwan,R.O.C.
NO.100 An-Kan Rd. Fong-Yuan City, Taichung County, Taiwan
Phone: +886(4)25271180
Fax:+886(4)25284445
Contact: Yu Chao-Chin

2. For each institution, indicate whether or not it is "engaged" in the research (see OHRP's guidance on "Engagement of Institutions in Research" at http://www.hhs.gov/ohrp/humansubjects/assurance/engage.htm.)

Fong-Yuan Hospital is the setting for recruitment for this research. Initial recruitment and data collection will occur onsite. Fong-Yuan Hospital has a separate IRB requirement and the researchers have concurrently obtained IRB support from the hospital (See Appendix 9). The student investigator will be responsible for the initial recruitment data collection.

3. Provide a description of each institution's role (whether engaged or not) in the human subjects research, adequacy of the facility (in order to ensure human subject safety in the case of an unanticipated emergency), responsibilities of its agents/employees, and oversight that you will be providing in order to ensure adequate and ongoing protection of the human subjects. You should only identify institutions that have agreed to participate. If additional institutions agree to participate at a later time, they must be added by amendment to the protocol.

Fong-Yuan Hospital will not be engaged in this research. Participant recruitment will take place on the

obstetrical ward in Fong-Yuan hospital. Data collection will be conducted by student investigator in Fong-Yuan hospital. All data collected from this study will be held by the student investigator for analysis. All survey data will be kept in a locked file cabinet at the home office of the student investigator. All data will be maintained by the student investigator and is accessible to the student investigator and PI only. After survey completion, data will be maintained in electronic file format on a pass-word protected laptop.

4. For each institution that is "engaged" provide an OHRP Federalwide Assurance (FWA) # if: (1) the research is not exempt, AND (2) the research involves a DIRECT FEDERAL award made to VCU (or application for such).

NOTE: Additional guidance at http://www.research.vcu.edu/irb/wpp/flash/wpp_guide.htm#XVII-6.htm, and http://www.research.vcu.edu/irb/wpp/flash/wpp_guide.htm#XVII-11.htm.

The OHRP FWA is not required because this study does not involve any federal awards.

XV. INVOLVEMENT OF INDEPENDENT INVESTIGATORS

INDEPENDENT INVESTIGATOR: an individual who is acting independently and not acting as an agent or employee of any institution or facility while carrying out his or her duties in the research protocol. Additional guidance at http://www.research.vcu.edu/irb/wpp/flash/wpp_guide.htm#XVII-15.htm.

ENGAGEMENT IN RESEARCH: An independent investigator becomes "engaged" in human subjects research when he/she (i) intervenes or interacts with living individuals for research purposes; or (ii) obtains individually identifiable private information for research purposes [45 CFR 46.102(d)-(f)]. See OHRP's guidance on "Engagement of Institutions in Research" at http://www.hhs.gov/ohrp/humansubjects/assurance/engage.htm.

1. Provide a list of independent investigators.

2. For each independent investigator indicate whether or not he/she is "engaged" or "not engaged" in the research

3. For each independent investigator who is "engaged": (1) describe his/her role with human subjects/identifiable human data, AND (2) describe YOUR oversight of his/her involvement.

N/A

NOTE: If an independent investigator is "engaged," and the research is (1) not exempt AND (2) involves a DIRECT FEDERAL award made to VCU (or application for such), the independent investigator must sign a formal written agreement with VCU certifying terms for the protection of human subjects. For an agreement to be approved: (1) the PI must directly supervise all of the research activities, (2) agreement must follow the ORSP template, (3) IRB must agree to the involvement of the independent investigator, AND (4) agreement must be in effect prior to final IRB approval.

XVI. HUMAN SUBJECTS INSTRUCTIONS (Be sure to use the sub-headings under A-I)

ALL sections of the Human Subjects Instructions must be completed with the exception of the section entitled "Special Consent Provisions." Complete that section if applicable.

A. DESCRIPTION

Provide a detailed description of the proposed involvement of human subjects or their private identifiable data in the work.

A sample size of 140 participants will be recruited in this study. Power analysis is used to estimate the number of participants necessary to reveal meaningful findings and to decrease the risk of a Type II error which occurs when incorrectly accepts a false full hypothesis. In this study, the computer-assisted power analysis (NQuery 7.0) has been used to determine the sample size for log- rank test of survival analysis in two groups (breastfeeding group: including exclusive and partial breastfeeding; bottle feeding group). If alpha level of 0.05 (2-tailed), hazard ratio of 2.437 (assuming that the proportion of the subjects who breastfeed is 0.65, and the proportion of the subjects who bottle-feed is 0.35 at 6 weeks postpartum; the proportion of breastfeeding and bottle feeding is according to the literature review.), and a power of 80% are set, 45 subjects in each group will be needed. In additional, in terms of item analysis, there should be at least five items as many subjects as items to minimize the probability of chance results when analyzing instrument items (Crocker & Algina, 1986; Nunnally, 1978; Ferketich, 1991). The largest number of items on Iowa Infant Feeding Attitude Scale (IIFAS) for item analysis is 17 , thus a sample size of 85 is adequate for these analysis. Additionally, Hansen, Tobler, and Graham (1990) found that the average attrition rate at the follow-up study was 18.6% at 3 months posttreatment and 32.5% at 3 years from a meta-analysis of 85 longitudinal cohorts in adolescent substance abuse research. In this study, participants will be followed up at 6 weeks postpartum, and the attrition rate will be considered as 20%. Finally, a total of 140 participants will be needed in this study based on power analysis and general consideration for having the enough sample size.

B. Subject Population

Describe the subject population in terms of sex, race, ethnicity, age, etc., and your access to the population that will allow recruitment of the necessary number of participants. Identify the criteria for inclusion or exclusion of any subpopulation and include a justification for any exclusion. Explain the rationale for the involvement of special cases of subjects, such as children, pregnant women, human fetuses, neonates, prisoners or others who are likely to be vulnerable. If you plan to allow for the enrollment of Wards of the State (or any other agency, institution, or entity), you must specifically request their inclusion and follow guidance on Wards and Emancipated Minors in the VCU IRB Written Policies and Procedures (specifically WPP#: XV-3) available at http://www.research.vcu.edu/irb/wpp/flash/wpp_guide.htm#XV-3.htm.

A convenience sample of 140 participants who are hospitalized for childbirth is used in this study.

Inclusion Criteria

All participants meet the following inclusion criteria: (1) age between 18 and 45 years old, (2) have given birth to a healthy, singleton, term infant (≥37 weeks and ≥ 2500 g) during hospitalization, and (3) all participants must be able to read and write in Chinese and understand the survey directions and questions (4) only women who had initiated breastfeeding of their babies while in the hospital stay will be included.

Exclusion Criteria

(1) Participants suffer from postnatal complications or with previous mental illness, (2) Infants who have major illness (chronic, acute, or congenital illness), and (3) infants are exclusively fed pumped breast milk. This is because what is being studied here is not merely breast milk, but included the mothers' act of breastfeeding.

C. Research Material

Identify the sources of research material obtained from individually identifiable living human subjects in the form of specimens, records, or data. Indicate whether the material or data will be obtained specifically for research purposes or whether use will be made of existing specimens, records, or data.

Data specifically for research purpose will be obtained using the Iowa Infant Feeding Attitudes Scale (IIFAS) through individual interview of participants. Also, ten socio-demographic variables will be obtained from the interviews before mothers discharge from hospital. The phone calls will occur at three-week interval to obtain mothers' breastfeeding status.

D. RECRUITMENT PLAN

Describe <u>in detail</u> your plans for the recruitment of subjects including: (1) how potential subjects will be identified (e.g., school personnel, health care professionals, etc), (2) how you will get the names and contact information for potential subjects, and (3) who will make initial contact with these individuals (if relevant) and how that contact will be done. If you plan to involve special cases of subjects, such as children, pregnant women, human fetuses, neonates, prisoners or others who are likely to be vulnerable, describe any special recruitment procedures for these populations.

When the proposed project is initiated, the student investigator will invite the mothers to participant in this study following the inclusion criteria. After the mothers wish to participant in the study, and the student investigator interviews each mother individually to explain the purpose of study and answer any question about the study and study protocol they have. Then, the student investigator will leave the IIFAS questionnaire including demographic information (See Appendix 10), the cover letter, and the contact information form (for mothers to provide their telephone number to the student investigator so that a follow-up to collect the data for mothers' breastfeeding status can be conducted at 3 and 6 weeks postpartum) in an unmarked envelope to allow the mothers to feel free to decide if they want to participant the study. The mothers can return the IIFAS questionnaire including demographic information and the contact information form to the student investigator in the unmarked envelope no matter whether the mothers participant the study or not.

E. POTENTIAL RISKS

Describe potential risks whether physical, psychological, social, legal, or other and assess their likelihood and seriousness. Where appropriate, describe alternative treatments and procedures that might be advantageous to the subjects.

This study presents no more than minimal risk to the participants.

F. RISK REDUCTION

Describe the procedures for protecting against or minimizing potential risk. Where appropriate, discuss provisions for ensuring necessary medical or professional intervention in the event of adverse events to the subjects. Also, where appropriate, describe the provisions for monitoring the data collected to ensure the safety of subjects.

The nature of the questions is not sensitive and unlikely to cause stress or anxiety for participants. All survey data will not include identifying data on it, and only ID number will be used to link to demographic data and response. The names, ID number and telephone numbers of participants will be kept in a separate file and used only for the follow-up. All data will be stored in locked file cabinet by the student investigator. Participants may withdraw from this study at anytime without affecting the care that they receive at hospital.

G. Additional Safeguards If Any Participants Will Be Vulnerable

Describe any additional safeguards to protect the rights and welfare of participants if you plan to involve special cases of subjects, such as children, pregnant women, human fetuses, neonates, prisoners or others who are likely to be vulnerable. Safeguards to protect the rights and welfare of participants might relate to Inclusion/Exclusion Criteria: ("Adults with moderate to severe cognitive impairment will be excluded." "Children must have diabetes. No normal controls who are children will be used.") Consent: ("Participants must have an adult care giver who agrees to the participant taking part in the research and will make sure the participant complies with research procedures." "Adults must be able to assent. Any dissent by the participant will end the research procedures.") Benefit: ("Individuals who have not shown benefit to this type of drug in the past will be excluded.").

N/A

H. Confidentiality

Describe how the confidentiality of data collected as part of this project will be protected including pre-screening data (e.g., physical controls on the data; access controls to the data; coding of data; legal controls, such as a Federal Certificate of Confidentiality; statistical methods; or reporting methods).

All data will be collected by the student investigator in person. All survey data will have no identifying data on it and will only be linked to demographic data by ID numbers. It will be coded with a subject number. Identifying information is stored separated from the data in a locked cabinet, and is maintained and accessible to the student investigators and PI only. No identifiable subject information will be reported in any publications that may result from this study. The data collection phone calls will be conducted in a private office with a lock door to prevent interruptions and possible data exposure. Immediately after the phone calls are completed, the investigator separated the mothers' name, subject number, and phone number from the survey data and returned the identifying information to the locked cabinet. The survey data will be kept for three years, but the identifying data will be destroyed immediately after the study is completed.

I. Privacy

Describe how the privacy interests of subjects will be protected where privacy refers to persons and their interests in controlling access to themselves, and assess their likely effectiveness. Identify what steps you will take for subjects to be comfortable: (1) in the research setting and (2) with the information being sought and the way it is sought.

Before data collection from the participants, the student investigator will have an introduction about the study that allows an open-warm atmosphere in which to conduct the survey is established. Participants will be reminded of their rights and any questions about the study that they have will be answered. Student investigator will leave the IIFAS questionnaire including demographic data form, a cover letter and the information form in an unmarked envelope to allow the mothers to feel free to decide if they want to participant the study. The process of data collection is designed to start and end in a positive manner and the questionnaire has not been designed to elicit negative emotions among participants in this study.

J. Risk/Benefit

Discuss why the risks to subjects are reasonable in relation to the anticipated benefits to subjects and in relation to the importance of the knowledge that may reasonably be expected to result. If a test article (investigational new drug, device, or biologic) is involved, name the test article and supply the FDA approval letter.

There are not obvious risks in relation to participants in this study. Also, there are no specific benefits to participants as a result of participating in this study. The results of this study are important in understanding mothers' attitudes and breastfeeding behavior and will be used to provide data for further research. The participants may gain some personal satisfaction in knowing they are contributing to the study that may help others in breastfeeding promotion.

K. Compensation Plan

Compensation for subjects (if applicable) should be described, including possible total compensation, any proposed bonus, and any proposed reductions or penalties for not completing the project.

Participants will be informed that participation in this study is completely voluntary and will not be compensated for participating in this study.

L. Consent Issues

1. Consent Process

Indicate who will be asked to provide consent/assent, who will obtain consent/assent, what language (e.g., English, Spanish) will be used by those obtaining consent/assent, where and when will consent/assent be obtained, what steps will be taken to minimize the possibility of coercion or undue influence, and how much time will subjects be afforded to make a decision to participate.

This study is categorized to expedited review of category 7 that consent could be waived, and the cover letter will be used instead of consent. Additionally, this study will be conducted in Taiwan, so the Chinese cover letter will be used for the participants. The English cover letter will be translated by a health professional (see Appendix 8 for his profile) to Chinese cover letter. When the recruitment is initiated, women who are hospitalized for childbirth will be invited to participant in this study. If the mothers wish to participant in this study, the student investigator will meet with the mothers individually to explain the purpose of study and answer any question about the study and study protocol they have at the obstetric ward during their hospitalization for postpartum care. Then, the student investigator will leave the IIFAS questionnaire including demographic information, the Chinese cover letter, and the contact information form to the mothers in an unmarked envelope to allow the mothers to feel free to decide if they want to participant the study. The mothers can return the IIFAS questionnaire including demographic information, the contact information form to the student investigator in the unmarked envelope no matter whether the mothers participant the study or not. Moreover, the student investigator will get in touch with the student advisor by Skype every two weeks to update and report the ongoing research and condition of data collection until this study is completed.

2. Special Consent Provisions

If some or all subjects will be cognitively impaired, or have language/hearing difficulties, describe how capacity for consent will be determined. Please consider using the VCU Informed Consent Evaluation Instrument available at http://www.research.vcu.edu/irb/guidance.htm. If you anticipate the need to obtain informed consent from legally authorized representatives (LARs), please describe how you will identify an appropriate representative and ensure that their consent is obtained. Guidance on LAR is available at

http://www.research.vcu.edu/irb/wpp/flash/wpp_guide.htm#XI-3.htm.

N/A

3. If request is being made to WAIVE SOME OR ALL ELEMENTS OF INFORMED CONSENT FROM SUBJECTS OR PERMISSION FROM PARENTS, explain why: (1) the research involves no more than minimal risk to the subjects, (2) the waiver or alteration will not adversely affect the rights and welfare of the subjects, (3) the research could not practicably be carried out without the waiver or alteration; AND (4) whether or not subjects will be debriefed after their participation. Guidance is available at http://www.research.vcu.edu/irb/wpp/flash/wpp_guide.htm#XI-1.htm.. NOTE: Waiver is not allowed for FDA-regulated research unless it meets FDA requirements for Waiver of Consent for Emergency Research (see below).

N/A

4. If request is being made to WAIVE DOCUMENTATION OF CONSENT, provide a justification for waiver based on one of the following two elements AND include a description of the information that will be provided to participants: (1) the only record linking the subject and the research would be the consent document and the principal risk would be potential harm resulting from a breach of confidentiality. Subject will be asked whether they want documentation linking them with the research, and each subject's wishes will govern; or (2) the research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required outside of the research context. Guidance is available at http://www.research.vcu.edu/irb/wpp/flash/wpp_guide.htm#XI-2.htm

This research presents no more than minimal risk for the subject. None of the information collected for the study is "sensitive" information. There are no medical procedures or any other procedure for this study that would normal require an informed consent outside the research context. Each mother will be approached by the student researcher. She will discuss the study with them and also give them a letter that explains the study. The mothers are asked to complete the data survey about breastfeeding attitudes and intentions; and alo provide contact information on a separate form so the student researcher may follow-up by phone to ask about breastfeeding duration. This will be explained to mothers during the discussion and is also explained in the letter.

The student researcher will leave the letter and the survey for the study and the contact information form for the follow-up phone call. The participants will keep the letter with the study information and return the survey and contact information form in the unmarked envelope, to the student researcher later that day. The student researcher will separate the research surveys and the contact information forms in two different secure places, only an ID number on each will link these forms for the duration of the data collection. The contact information will be used by the student researcher only for a follow-up call 6 weeks later to ask questions about duration of breastfeeding and why breastfeeding was discontinued if that has occurred. The contact information will not be kept with the data and will be destroyed once the follow-up phone is completed. A script has been prepared for the follow-up phone call and will be used to collect data about breastfeeding duration (see appendix).

For this reason we are requesting waiver of documentation of consent.

5. If applicable, explain the ASSENT PROCESS for children or decisionally impaired subjects. Describe the

procedures, if any, for re-consenting children upon attainment of adulthood. Describe procedures, if any, for consenting subjects who are no longer decisionally impaired. Guidance is available at http://www.research.vcu.edu/irb/wpp/flash/wpp_guide.htm#XV-2.htm.and http://www.research.vcu.edu/irb/wpp/flash/wpp_guide.htm#XVII-7.htm.

N/A

6. If request is being made to WAIVE THE REQUIREMENT TO OBTAIN ASSENT from children age 7 or higher, or decisionally impaired subjects, explain why: (1) why some or all of the individuals age 7 or higher will not be capable of providing assent based on their developmental status or impact of illness; (2) the research holds out a prospect of direct benefit not available outside of the research; AND/OR (3) [a] the research involves no more than minimal risk to the subjects, [b] the waiver or alteration will not adversely affect the rights and welfare of the subjects, [c] the research could not practicably be carried out without the waiver or alteration; AND [d] whether or not subjects will be debriefed after their participation. Guidance is available at http://www.research.vcu.edu/irb/wpp/flash/wpp_guide.htm#XV-2.htm

N/A

7. If request is being made to waive consent for emergency research, see guidance at http://www.research.vcu.edu/irb/wpp/flash/wpp_guide.htm#XVII-16.htm.

N/A

8. If applicable, address the following issues related to GENETIC TESTING:

a. FUTURE CONTACT CONCERNING FURTHER GENETIC TESTING RESEARCH
Describe the circumstances under which the subject might be contacted in the future concerning further participation in this or related genetic testing research.

N/A

b. FUTURE CONTACT CONCERNING GENETIC TESTING RESULTS
If planned or possible future genetic testing results are unlikely to have clinical implications, then a statement that the results will not be made available to subjects may be appropriate. If results might be of clinical significance, then

describe the circumstances and procedures by which subjects would receive results. Describe how subjects might access genetic counseling for assistance in understanding the implications of genetic testing results, and whether this might involve costs to subjects. Investigators should be aware that federal regulations, in general, require that testing results used in clinical management must have been obtained in a CLIA-certified laboratory.

N/A

c. WITHDRAWAL OF GENETIC TESTING CONSENT

Describe whether and how subjects might, in the future, request to have test results and/or samples withdrawn in order to prevent further analysis, reporting, and/or testing.

N/A

d. GENETIC TESTING INVOLVING CHILDREN OR DECISIONALLY IMPAIRED SUBJECTS

Describe procedures, if any, for consenting children upon the attainment of adulthood. Describe procedures, if any, for consenting subjects who are no longer decisionally impaired.

N/A

e. CONFIDENTIALITY

Describe the extent to which genetic testing results will remain confidential and special precautions, if any, to protect confidentiality.

N/A

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CITI Collaborative Institutional Training Initiative

Basic/Refresher Course Human Subjects Research Curriculum Completion Report
Printed on

Learner: Yen-Ju Ho (username: hoyenju)
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Stage . Basic Course Passed on 06/12/09 (Ref # 2892424)

Required Modules	Date Completed	Score
Introduction	06/11/09	no quiz
History and Ethical Principles - SBR	06/12/09	4/4 (100%)
Defining Research with Human Subjects - SBR	06/12/09	5/5 (100%)
The Regulations and The Social and Behavioral Sciences - SBR	06/12/09	5/5 (100%)
Assessing Risk in Social and Behavioral Sciences - SBR	06/12/09	5/5 (100%)
Informed Consent - SBR	06/12/09	4/4 (100%)
Privacy and Confidentiality - SBR	06/12/09	4/4 (100%)
Research with Prisoners - SBR	06/12/09	4/4 (100%)
Research with Children - SBR	06/12/09	4/4 (100%)
Research in Public Elementary and Secondary Schools - SBR	06/12/09	4/4 (100%)
International Research - SBR	06/12/09	3/3 (100%)
Internet Research - SBR	06/12/09	5/5 (100%)
Virginia Commonwealth University	06/12/09	no quiz

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI participating institution. Falsified information and unauthorized use of the CITI course site is unethical, and may be considered scientific misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Course Coordinator

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CITI Collaborative Institutional Training Initiative

Basic/Refresher Course Human Subjects Research Curriculum Completion Report
Printed on Tuesday, August 12, 2008

Learner: Jacqueline McGrath (username: jmmcgrath)
Institution: Virginia Commonwealth University
Contact Information Richmond, VA
Department: NURSING
Phone: 804-828-1930
Email: jmmcgrath@vcu.edu

Social and Behavioral: *This course is suitable for Investigators and staff conducting SOCIAL / HUMANISTIC / BEHAVIORAL RESEARCH with human subjects. Unless previously completed you **MUST** take the Basic Course.*

Stage 2. Refresher Course Passed on 08/12/08 (Ref # 2020277)

Required Modules	Date Completed	Score
SBR 101 REFRESHER MODULE 1. History and Ethics	08/12/08	3/5 (60%)
SBR 101 REFRESHER MODULE 2. Regulatory Overview	08/12/08	5/5 (100%)
SBR 101 REFRESHER MODULE 3. Fundamental Issues.	08/12/08	4/5 (80%)
SBR 101 REFRESHER MODULE 4. Vulnerable Subjects	08/12/08	4/4 (100%)
SBR 101 REFRESHER MODULE 5. Additional Topics	08/12/08	5/5 (100%)
Group Harms: Research with Culturally or Medically Vulnerable Groups.	08/12/08	3/3 (100%)
Conflicts of Interest in Research Involving Human Subjects.	08/12/08	2/2 (100%)
How to Complete the CITI Refresher Course and Receive a Completion Report	08/12/08	no quiz
Virginia Commonwealth University	08/12/08	no quiz

Elective Modules	Date Completed	Score
Defining Research with Human Subjects - SBR	08/12/08	80
Informed Consent in Social & Behavioral Research	08/12/08	100
Assessing Risk in Social & Behavioral Research	08/12/08	100
101 Refresher Course - An Overview of Research with Vulnerable Subjects	08/12/08	50

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI participating institution. Falsified information and unauthorized use of the CITI course site is unethical, and may be considered scientific misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Course Coordinator

Return

Appendix 2

The Iowa Infant Feeding Attitude Scale

For each of the following statements, please indicate how much you agree or disagree by circling the number that most closely corresponds to your opinion (1=strong disagreement (SD), 2=disagreement (D), 3=neutral (N), 4=agreement (A), 5=strong agreement (SA)). You may choose any number from 1 to 5.

	SD	D	N	A	SA
*1. The nutritional benefits of breast milk last only until the baby is weaned from breast milk.	1	2	3	4	5
*2. Formula-feeding is more convenient than breastfeeding.	1	2	3	4	5
3. Breast-feeding increases mother-infant bonding.	1	2	3	4	5
*4. Breast milk is lacking in iron.	1	2	3	4	5
5. Formula-fed babies are more likely to be overfed than are breast-fed babies.	1	2	3	4	5
*6. Formula-feeding is the better choice if a mother plans to work outside the home.	1	2	3	4	5
7. Mothers who formula-feed miss one of the great joys of motherhood.	1	2	3	4	5
*8. Women should not breast-feed in public places such as restaurants.	1	2	3	4	5
9. Babies fed breast milk are healthier than babies who are fed formula.	1	2	3	4	5
*10. Breast-fed babies are more likely to be overfed than formula-fed babies.	1	2	3	4	5
*11. Fathers feel left out if a mother breast-feeds.	1	2	3	4	5
12. Breast milk is the ideal food for babies.	1	2	3	4	5
13. Breast milk is more easily digested than formula.	1	2	3	4	5

*14. Formula is as healthy for an infant as breast milk.	1	2	3	4	5
15. Breast-feeding is more convenient than formula feeding.	1	2	3	4	5
16. Breast milk is less expensive than formula.	1	2	3	4	5
*17. A mother who occasionally drinks alcohol should not breast-feed her baby.	1	2	3	4	5

Note. Items marked with asterisks are reverse-scored and the scores for each item are then summed. High scores indicate more positive attitudes toward breast feeding.

Appendix 3

Testing of Comparability/Interpretability

The purpose of testing of comparability and interpretability is to compare the original version of Iowa Infant Feeding Attitude Scale (IIFAS) with the back-translated version (the two English versions) for comparability of language and similarity of interpretation.

Please according to your opinion, circle the level of comparability and interpretability for each question.

1a) The nutritional benefits of breast milk last only until the baby is weaned from breast milk.	1b) The nutritional benefits of breast milk are only preserved until weaning.	A) Comparability of Language EXTREMELY COMPARABLE 1 2 3 4 5 6 7 MODERATELY *COMPARABLE* NOT AT ALL COMPARABLE B) Similarity of Interpretation EXTREMELY SIMILAR 1 2 3 4 5 6 7 MODERATELY SIMILAR NOT AT AL SIMILAR
2a) Formula-feeding is more convenient than breastfeeding.	2b) It is more convenient to feed an infant formula rather than breastfeeding.	A) Comparability of Language EXTREMELY COMPARABLE 1 2 3 4 5 6 7 MODERATELY *COMPARABLE* NOT AT ALL COMPARABLE B) Similarity of Interpretation EXTREMELY SIMILAR 1 2 3 4 5 6 7 MODERATELY SIMILAR NOT AT AL SIMILAR
3a) Breast-feeding increases mother-infant bonding.	3b) Breastfeeding increase bonding between mother and baby.	A) Comparability of Language EXTREMELY COMPARABLE 1 2 3 4 5 6 7 MODERATELY *COMPARABLE* NOT AT ALL COMPARABLE B) Similarity of Interpretation EXTREMELY SIMILAR 1 2 3 4 5 6 7 MODERATELY SIMILAR NOT AT AL SIMILAR
4a) Breast milk is lacking in iron	4b) Breast milk lacks iron.	A) Comparability of Language EXTREMELY COMPARABLE 1 2 3 4 5 6 7 MODERATELY *COMPARABLE* NOT AT ALL COMPARABLE B) Similarity of Interpretation EXTREMELY SIMILAR 1 2 3 4 5 6 7 MODERATELY SIMILAR NOT AT AL SIMILAR

5a) Formula-fed babies are more likely to be overfed than are breast-fed babies.	5b) It is more likely to overfeed on baby formula than breastfeeding.	A) Comparability of Language EXTREMELY COMPARABLE 1 2 3 4 5 6 7 MODERATELY *COMPARABLE* NOT AT ALL COMPARABLE B) Similarity of Interpretation EXTREMELY SIMILAR 1 2 3 4 5 6 7 MODERATELY SIMILAR NOT AT AL SIMILAR
6a) Formula-feeding is the better choice if a mother plans to work outside the home.	6b) If the mother is needed to work outside the home, formula feeding is a good choice.	A) Comparability of Language EXTREMELY COMPARABLE 1 2 3 4 5 6 7 MODERATELY *COMPARABLE* NOT AT ALL COMPARABLE B) Similarity of Interpretation EXTREMELY SIMILAR 1 2 3 4 5 6 7 MODERATELY SIMILAR NOT AT AL SIMILAR
7a) Mothers who formula-feed miss one of the great joys of motherhood.	7b) Mothers who use formula will miss out on one of the great joys of motherhood	A) Comparability of Language EXTREMELY COMPARABLE 1 2 3 4 5 6 7 MODERATELY *COMPARABLE* NOT AT ALL COMPARABLE B) Similarity of Interpretation EXTREMELY SIMILAR 1 2 3 4 5 6 7 MODERATELY SIMILAR NOT AT AL SIMILAR
8a) Women should not breast-feed in public places such as restaurants.	8b) Women should not breastfeed in public places, for example in restaurants.	A) Comparability of Language EXTREMELY COMPARABLE 1 2 3 4 5 6 7 MODERATELY *COMPARABLE* NOT AT ALL COMPARABLE B) Similarity of Interpretation EXTREMELY SIMILAR 1 2 3 4 5 6 7 MODERATELY SIMILAR NOT AT AL SIMILAR
9a) Babies fed breast milk are healthier than babies who are fed formula.	9b) Babies who are breastfed are healthier than those who are fed formula.	A) Comparability of Language EXTREMELY COMPARABLE 1 2 3 4 5 6 7 MODERATELY *COMPARABLE* NOT AT ALL COMPARABLE B) Similarity of Interpretation EXTREMELY SIMILAR 1 2 3 4 5 6 7 MODERATELY SIMILAR NOT AT AL SIMILAR

10a) Breast-fed babies are more likely to be overfed than formula-fed babies.	10b) Mothers that breastfeed will more likely overfeed than formula fed.	A) Comparability of Language EXTREMELY COMPARABLE 1 2 3 MODERATELY *COMPARABLE* 4 5 6 NOT AT ALL COMPARABLE 7 B) Similarity of Interpretation EXTREMELY SIMILAR 1 2 3 MODERATELY SIMILAR 4 5 6 NOT AT AL SIMILAR 7
11a) Fathers feel left out if a mother breast-feeds.	11b) If a mother breastfeeds, a father will feel neglected.	A) Comparability of Language EXTREMELY COMPARABLE 1 2 3 MODERATELY *COMPARABLE* 4 5 6 NOT AT ALL COMPARABLE 7 B) Similarity of Interpretation EXTREMELY SIMILAR 1 2 3 MODERATELY SIMILAR 4 5 6 NOT AT AL SIMILAR 7
12a) Breast milk is the ideal food for babies.	12b) Breast milk is the ideal food for a baby.	A) Comparability of Language EXTREMELY COMPARABLE 1 2 3 MODERATELY *COMPARABLE* 4 5 6 NOT AT ALL COMPARABLE 7 B) Similarity of Interpretation EXTREMELY SIMILAR 1 2 3 MODERATELY SIMILAR 4 5 6 NOT AT AL SIMILAR 7
13a) Breast milk is more easily digested than formula.	13b) It is easier to digest breast milk than formula.	A) Comparability of Language EXTREMELY COMPARABLE 1 2 3 MODERATELY *COMPARABLE* 4 5 6 NOT AT ALL COMPARABLE 7 B) Similarity of Interpretation EXTREMELY SIMILAR 1 2 3 MODERATELY SIMILAR 4 5 6 NOT AT AL SIMILAR 7
14a) Formula is as healthy for an infant as breast milk.	14b) In relation to babies, formula feeding is just as healthy as breastfeeding.	A) Comparability of Language EXTREMELY COMPARABLE 1 2 3 MODERATELY *COMPARABLE* 4 5 6 NOT AT ALL COMPARABLE 7 B) Similarity of Interpretation EXTREMELY SIMILAR 1 2 3 MODERATELY SIMILAR 4 5 6 NOT AT AL SIMILAR 7

15a) Breast-feeding is more convenient than formula feeding.	15b) It is more convenient to breastfeed rather than feeding formula.	A) Comparability of Language EXTREMELY MODERATELY NOT AT ALL COMPARABLE *COMPARABLE* COMPARABLE 1 2 3 4 5 6 7 B) Similarity of Interpretation EXTREMELY MODERATELY NOT AT AL SIMILAR SIMILAR SIMILAR 1 2 3 4 5 6 7
16a) Breast milk is less expensive than formula.	16b) Breast milk is cheaper than formula.	A) Comparability of Language EXTREMELY MODERATELY NOT AT ALL COMPARABLE *COMPARABLE* COMPARABLE 1 2 3 4 5 6 7 B) Similarity of Interpretation EXTREMELY MODERATELY NOT AT AL SIMILAR SIMILAR SIMILAR 1 2 3 4 5 6 7
17a) A mother who occasionally drinks alcohol should not breast-feed her baby.	17a) Mothers who drink alcohol occasionally should not breastfeed.	A) Comparability of Language EXTREMELY MODERATELY NOT AT ALL COMPARABLE *COMPARABLE* COMPARABLE 1 2 3 4 5 6 7 B) Similarity of Interpretation EXTREMELY MODERATELY NOT AT AL SIMILAR SIMILAR SIMILAR 1 2 3 4 5 6 7
For each of the following statements, please indicate how much you agree or disagree by circling the number that most closely corresponds to your opinion.	Please rate each statement by circling the number on the level of your agreement	A) Comparability of Language EXTREMELY MODERATELY NOT AT ALL COMPARABLE *COMPARABLE* COMPARABLE 1 2 3 4 5 6 7 B) Similarity of Interpretation EXTREMELY MODERATELY NOT AT AL SIMILAR SIMILAR SIMILAR 1 2 3 4 5 6 7
Strong disagreement Disagreement Neutral Agreement Strong agreement	Strongly disagree disagree neutral agree strongly agree	A) Comparability of Language EXTREMELY MODERATELY NOT AT ALL COMPARABLE *COMPARABLE* COMPARABLE 1 2 3 4 5 6 7 B) Similarity of Interpretation EXTREMELY MODERATELY NOT AT AL SIMILAR SIMILAR SIMILAR 1 2 3 4 5 6 7

Appendix 4

這問卷是愛德華嬰兒餵食量表

請每題依據它對於文化的相關性做評分。1=沒有相關，2=有些相關，3=相當相關，4=非常相關

	問卷題目	內容效度	修改建議
1	母奶的營養好處僅持續到嬰兒斷奶為止。	沒有相關 1　有些相關 2　相當相關 3　非常相關 4	
2	餵食配方奶比哺餵母奶方便。	沒有相關 1　有些相關 2　相當相關 3　非常相關 4	
3	哺餵母奶增進母嬰之間的關係。	沒有相關 1　有些相關 2　相當相關 3　非常相關 4	
4	母乳缺乏鐵質。	沒有相關 1　有些相關 2　相當相關 3　非常相關 4	
5	餵食配方奶比哺餵母奶更可能過度餵食。	沒有相關 1　有些相關 2　相當相關 3　非常相關 4	
6	假如母親需要外出工作，餵食配方奶是比較好的選擇。	沒有相關 1　有些相關 2　相當相關 3　非常相關 4	
7	餵食配方奶的母親會錯失身為母親的一大樂趣。	沒有相關 1　有些相關 2　相當相關 3　非常相關 4	

8	女人不應該在公共場所哺餵母奶，比如在餐廳。	沒有相關 1　有些相關 2　相當相關 3　非常相關 4	
9	餵母奶的嬰兒比餵配方奶的嬰兒還要健康。	沒有相關 1　有些相關 2　相當相關 3　非常相關 4	
10	哺餵母奶比餵食配方奶更可能過度餵食。	沒有相關 1　有些相關 2　相當相關 3　非常相關 4	
11	假如母親哺餵母奶，父親會覺得被忽略。	沒有相關 1　有些相關 2　相當相關 3　非常相關 4	
12	母乳對嬰兒是理想的食物。	沒有相關 1　有些相關 2　相當相關 3　非常相關 4	
13	母奶比配方奶更容易被消化。	沒有相關 1　有些相關 2　相當相關 3　非常相關 4	
14	對嬰兒而言，配方奶和母奶一樣健康。	沒有相關 1　有些相關 2　相當相關 3　非常相關 4	
15	哺餵母奶比餵食配方奶方便。	沒有相關 1　有些相關 2　相當相關 3　非常相關 4	
16	母奶比配方奶便宜。	沒有相關 1　有些相關 2　相當相關 3　非常相關 4	

17	偶而喝酒的母親不該哺餵母奶。	沒有相關 1　有些相關 2　相當相關 3　非常相關 4	

謝謝妳的幫忙和給予的珍貴意見。

This questionnaire is the Iowa Infant Feeding Attitude Scale (IIFAS).
Please rate independently the degree of cultural relevance of each item of the translated version of the questionnaire on a 4-point Likert-type scale: 1:= not relevant, 2= somewhat relevant, 3=quite relevant, 4= very relevant

	Questionnaire	Content validity	Suggestion
1	The nutritional benefits of breast milk last only until the baby is weaned from breast milk.	not relevant 1 somewhat relevant 2 quite relevant 3 very relevant 4	
2	Formula-feeding is more convenient than breastfeeding.	not relevant 1 somewhat relevant 2 quite relevant 3 very relevant 4	
3	Breast-feeding increases mother-infant bonding.	not relevant 1 somewhat relevant 2 quite relevant 3 very relevant 4	
4	Breast milk is lacking in iron.	not relevant 1 somewhat relevant 2 quite relevant 3 very relevant 4	
5	Formula-fed babies are more likely to be overfed than are breast-fed babies.	not relevant 1 somewhat relevant 2 quite relevant 3 very relevant 4	
6	Formula-feeding is the better choice if a mother plans to work outside the home.	not relevant 1 somewhat relevant 2 quite relevant 3 very relevant 4	
7	Mothers who formula-feed miss one of the great joys of motherhood.	not relevant 1 somewhat relevant 2 quite relevant 3 very relevant 4	
8	Women should not breast-feed in public places such as restaurants.	not relevant 1 somewhat relevant 2 quite relevant 3 very relevant 4	
9	Babies fed breast milk are healthier than babies who are fed formula.	not relevant 1 somewhat relevant 2 quite relevant 3 very relevant 4	
10	Breast-fed babies are more likely to be	not relevant 1 somewhat relevant 2 quite relevant 3 very relevant 4	

	overfed than formula-fed babies.		
11	Fathers feel left out if a mother breast-feeds.	not relevant somewhat relevant quite relevant very relevant 1 2 3 4	
12	Breast milk is the ideal food for babies.	not relevant somewhat relevant quite relevant very relevant 1 2 3 4	
13	Breast milk is more easily digested than formula.	not relevant somewhat relevant quite relevant very relevant 1 2 3 4	
14	Formula is as healthy for an infant as breast milk.	not relevant somewhat relevant quite relevant very relevant 1 2 3 4	
15	Breast-feeding is more convenient than formula feeding.	not relevant somewhat relevant quite relevant very relevant 1 2 3 4	
16	Breast milk is less expensive than formula.	not relevant somewhat relevant quite relevant very relevant 1 2 3 4	
17	A mother who occasionally drinks alcohol should not breast-feed her baby.	not relevant somewhat relevant quite relevant very relevant 1 2 3 4	

Thanks for help and valuable opinions.

Appendix 5

母乳哺餵態度量表

下列每一題敘述中，請依照你自己的意見，圈選出同意或不同意的程度。1=非常不同意, 2=不同意, 3=沒意見, 4=同意 , 5=非常同意 。妳可以選擇任何的數字由 1 至 5。

	問卷題目	非常不同意	不同意	沒意見	同意	非常同意
1	母奶的營養好處僅持續到嬰兒斷奶為止。	1	2	3	4	5
2	餵食配方奶比哺餵母奶方便。	1	2	3	4	5
3	哺餵母奶增進母嬰之間的關係。	1	2	3	4	5
4	母乳缺乏鐵質。	1	2	3	4	5
5	餵食配方奶比哺餵母奶更可能過度餵食。	1	2	3	4	5
6	假如母親需要外出工作，餵食配方奶是比較好的選擇。	1	2	3	4	5
7	餵食配方奶的母親會錯失身為母親的一大樂趣。	1	2	3	4	5
8	女人不應該在公共場所哺餵母奶，	1	2	3	4	5

	比如在餐廳。					
9	餵母奶的嬰兒比餵配方奶的嬰兒還要健康。	1	2	3	4	5
10	哺餵母奶比餵食配方奶更可能過度餵食。	1	2	3	4	5
11	假如母親哺餵母奶，父親會覺得被忽略。	1	2	3	4	5
12	母乳對嬰兒是理想的食物。	1	2	3	4	5
13	母奶比配方奶更容易消化。	1	2	3	4	5
14	對嬰兒而言，配方奶和母奶一樣健康。	1	2	3	4	5
15	哺餵母奶比餵食配方奶方便。	1	2	3	4	5
16	母奶比配方奶便宜。	1	2	3	4	5
17	每週喝酒一次的母親不該哺餵母奶。	1	2	3	4	5

Appendix 6

Dear mothers

Congratulation on your new baby!! You are being asked to participant in a nursing study. We hope to learn about how maternal attitudes affect mothers' feeding choice. You are being asked to participate in this study because you have been hospitalized for childbirth and have chosen to breastfeed your baby in the hospital.

If you decide to participate in the project, you will need to complete a survey before you go home from the hospital. You will also be asked to provide your name and telephone number on a separate form so that we can contact you regarding how breastfeeding is going for you and your baby at the third week and sixth week postpartum. We will only use your name and phone number to contact you for the study. No one else but the study personnel will have access to your name and phone number. The survey and 2 phone calls will each take only about 10 minutes of your time. In the phone calls, you may be asked to provide reasons for why you did not continue breastfeeding your baby. We also will be asking questions about the type of support you received from family and friends during this time.

If you decide to participate please complete the attached survey and return it in the enclosed envelope. Your decision, whether or not to participate will not affect the care that you receive from Fong-Yuan Hospital. If you decide to participate, you are not obligated to answer all questions, and may stop at any time or refuse to participate in the phone calls, we will only be calling your twice after go home.

Questions about your rights as a volunteer in research can be directed to Virginia Commonwealth University's Human Subjects Research Review Committee at 0021-804-827-2157and Fong-Yuan Hospital's Human Subjects Research Review Committee at 04-25271180

Your voluntary completion of the survey constitutes consent to participant. Thanks you for assisting us with this study.

Sincerely,

Jacqueline M. McGrath / Yen-Ju Ho

Appendix 6

親愛的媽媽們您好

恭喜妳有了新寶寶了! 您被邀請參與在一個護理研究。我們希望能了解媽媽的態度如何影響其哺乳的選擇。您被邀請參與在這個研究，因為您是因生產而住院而且在醫院中選擇了哺餵母乳。

假如您決定參與在這個研究，在您出院回家之前，您將需要完成一份問卷。而且在另一分開的表格，您將被要求去提供您的名字和電話，如此我們可以在您產後第三週和第六週，能連絡您關於母乳哺餵的情形。您的名字和電話將只為了研究目的，而作為聯絡使用。除了研究人員沒有其它人可以使用您的名字和電話。這個問卷和每次的電話訪談將只花費您約十分鐘的時間。在電話訪談中，您將被詢問關於為什麼您沒有持續哺餵母乳的理由。我們也將詢問您在這段期間，從家人和朋友中，接受到何種的支持。

如果您決定參與在這個研究，請完成這份問卷，並放入密封的信封中交回。不管您決定參與或不參與，將不會影響您從豐原醫院中所接受到的照護。假如您決定參與在這個研究，您將不會被強迫去回答全部的問題，您可以隨時停止回答或拒絕參與在之後的電話訪問。

關於您的權利，如果您有任何的問題，可以聯絡維吉尼亞聯邦大學的人體試驗委員會 0021-804-827-2157 或署立豐原醫院的人體試驗委員會 04-25271180。

謹致

Jacqueline M. McGrath/何艷如

Appendix 7

Hello,
Are you _____ (confirm that you are talking to the right person)
My name is Yen Ju Ho and I am nursing student at Virginia Commonwealth University and I am studying the effects of maternal breastfeeding attitudes. Remember that I spoke with you about a breastfeeding nursing study at the hospital and that I would be calling you in a few weeks to follow-up?

I am calling to follow-up with a few questions related to how breastfeeding is going for you and your baby? Is it OK if we talk for a few minute? You do not have to continue participation but it would be very helpful to me if you did.

I only have a few questions and this discussion should only take about 10 minutes of your time. If not is there a better time for me to call you back? Or, would you like to discontinue your participation in this study? By continuing with this discussion you are providing your consent to continue participation in this study. I appreciate the time you are taking to speak to me.
(once they agree I will continue)
How are you? How is your baby doing?

I would like to ask you about your infant feeding method now. Are you still breastfeeding? (If the mother change feeding method form breastfeeding to bottle feeding, they are asked an open-ended question to provide the reasons regarding weaning.)
The question is "what are the reasons you chose to stop breastfeeding?"

(They also are asked two open-ended questions about the support they received.)
"as you look back over the time you have breastfeed, who has been supportive to you since baby's birth?" (such as family or friends)
"what type of support you received ?" (such as encouragement or caregiving help)
Is there anything else about your breastfeeding experience that you would like to share with me?

"Thank you for your time and participation in this study. I appreciate the information you have shared with me."

If this is the first of the two planned calls I will also remind them about when I will be calling again to complete the study.

Appendix 7

哈囉

您是 _____ (確定是和要找的人說話)

我的名字是何艷如，是維吉尼亞聯邦大學的學生，目前正在研究母親哺乳態度的影響。還記得我在醫院中曾和您談過的護理研究和我將會在您出院幾週後打電話追蹤嗎?

我打電話給您是要問您一些問題關於您母乳哺餵的情形如何? 您方便談話幾分鐘嗎? 您可以不必持續參與，不過，如果您參與，將是對我非常有幫助的。

我只有幾個問題，大約只花費您十分鐘的時間。如果現在您不方便，什麼時候我可以打電話和您訪談? 或您不想再持續參與了? 如果您願意持續這個討論，代表您同意持續參與在這個研究。謝謝您花時間接受訪談。(一但他們同意參與，我將持續問以下的問題)

您好嗎? 您的寶寶好嗎?

我想要詢問有關您寶寶現在餵食的方法。您持續哺餵母乳嗎?

(假如媽媽改變餵食方法從哺餵母乳到餵處方奶)

另一個問題是 " 您停止哺餵母乳的理由是什麼?"

(他們也被問二個問題關於他們所接受到的支持)

"在這一段您哺餵母乳的期間，誰支持您哺餵母乳?" (像是家人或朋友)

"您接受到哪種支持?" (像是鼓勵您或給您照顧上的幫忙)

您還有其它的哺乳經驗，想要和我分享的嗎?

謝謝您花的時間和參與在這個研究。我很感謝您所提供的訊息。

(假如這是二次電話訪談的其中一次，我也將提醒他們關於何時我還會再打電話和他們訪談。)

Appendix 8

Chao-Chin, Yu who graduated from China medical university, Taiwan, school of medicine in 1997 works at hospital as a surgeon. I have been learning English from middle school until now. I have published some English articles in various journals, and presented several English posters in some conferences. I also translate some English articles to Chinese for the hospital continuing education that share some new knowledge with coworkers and staffs. Below is the resume that outlines my education background, work experiences, and articles and posters that have been published or presented in English or Chinese journals and meetings.

Resume

Chao-chin, Yu

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Education

China medical university, Taiwan, School of Medicine 9/1990-6/1997

Work Experience

5/2004-now: Fong-Yuan Hospital Department Of Health Executive Yuan,Taiwan,R.O.C.
An attending surgeon

8/2000-8/2003 : China medical university hospital
A resident surgeon

Publication

Chao-Chin Yu, Chen-Teng Wu, Chun-Lieh Chen,& Hsiu-Ming Lin (2006). Neglected Rupture of the Urinary Bladder in a Patient with Tonic-Clonic Seizure and Mental Retardation. *Mid-Taiwan Journal of Medicine,1*,187-189.

Chao-Chin Yu, Chen-Teng Wu, Chun-Lieh Chen, & Hsiu-Ming Lin(2007). Resection Margin in Preventing the Intrahepatic Recurrence after Resection of Hepatocellular Carcinoma.

Formosan Journal of Surgery,6,236-242.

Darren T. Chen, Chun-Ying Chu, Chih-Yi Chen, Hsiu-Ching Yang, Yung-Yen Chiang, Tze-Yi Lin, I-Ping Chiang, Duen-Yau Chuang, Chao-Chin Yu & Kuan-Chih Chow (2008). Expression of short form oncostatin M receptor as a decoy receptor in lung adenocarcinomas. *Journal of Pathology, 215*, 290–299.

Posters/Oral presentation

Chao-Chin Yu, Mei-Due Yang, TM Yuan, JC Su, KC Lai, CC Yao; Multidisciplinary approach for the non-colorectal hepatic metastases(NCHM). (Surgeon meeting in Taiwan, oral presentation, Mar 2001).

Chao-Chin Yu, Mei-Due Yang, TM Yuan, JC Su, KC Lai, CC Yao; Echinococcal Infection Co-Exited with a HBV-related Hepatocellular Carcinoma. (Surgeon meeting in Taiwan, oral presentation, Mar 2002)

Chao-Chin Yu, Mei-Du Yang ; The prognostic factor and recurrence after resection of hepatocellular carcinoma(Surgeon meeting in Taiwan,poster, Mar 27, 2005).

Chao-Chin Yu, Chen-Teng Wu, CL Chen, HM Lin; Neglected Rupture of the Urinary Bladder in a Patient with Tonic-Clonic Seizure and Mental Retardation (Surgeon meeting in Taiwan, poster, Mar 2006)

Chao-Chin Yu, Mei-Du Yang; A 0.5-cm resection margin compared to the traditional 1-cm margin is no less effective in decreasing the disease free interval after resection of hepatocellular carcinoma (poster in Rome. Dec 2, 2006)

Chao-Chin Yu, Chen-Teng Wu, Mei-Du Yang1 ,Long-Bin Jeng1; A 0.5-cm resection margin is enough to decrease the recurrence rate after resection of hepatocellular carcinoma(oral Surgeon meeting in Taiwan, presentation, Mar 25, 2007)

Chao-Chin Yu, Chen-Teng Wu, Mei-Du Yang1 ,Long-Bin Jeng1; Comparison of minor and major

hepatic resection for small hepatocellular carcinoma(Surgeon meeting in Taiwan, poster, Mar 24,

2007)

Chao-Chin Yu, Chen-Teng Wu, Mei-Du Yang1 ,Long-Bin Jeng1; Effects of preoperative transcatheter

hepatic arterial chemoembolization for hepatocellular carcinoma(Surgeon meeting in Taiwan,

poster, Mar 24, 2007)

Chao-Chin Yu, Chen-Teng Wu, Chun-Lieh Chen, Jin-Tang Chen; Follicular infundibular tumor with

malignant change (Surgeon meeting in Taiwan, poster, Mar 29, 2008)

Chao-Chin Yu, Chen-Teng Wu, Chun-Lieh Chen, Jin-Tang Chen, Ischemic bowel disease caused by

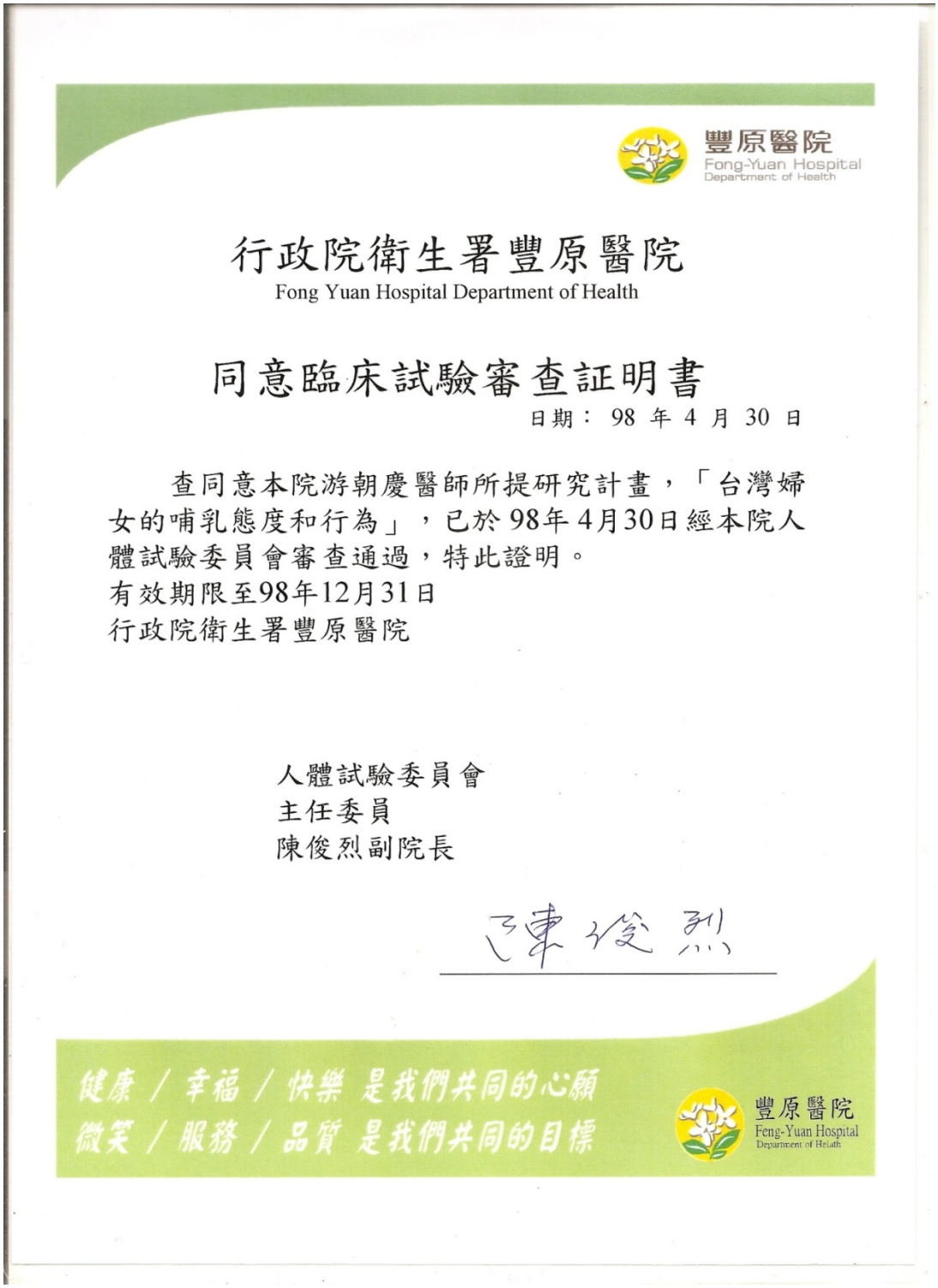
primary antiphospholipid syndrome (Surgeon meeting in Taiwan, poster, Mar 29, 2008)

Chao-Chin Yu, Chen-Teng Wu, Mei-Du Yang ,Long-Bin Jeng, A Multivariate Analysis on risk

factors for early recurrence following resection of hepatocellular carcinoma (Surgeon meeting in

Taiwan, poster, Mar 29, 2008)

Appendix 9



豐原醫院
Fong-Yuan Hospital
Department of Health

行政院衛生署豐原醫院
Fong Yuan Hospital Department of Health

同意臨床試驗審查証明書

日期： 98 年 4 月 30 日

查同意本院游朝慶醫師所提研究計畫，「台灣婦女的哺乳態度和行為」，已於 98年 4月30日經本院人體試驗委員會審查通過，特此證明。
有效期限至98年12月31日
行政院衛生署豐原醫院

人體試驗委員會
主任委員
陳俊烈副院長

陳俊烈

健康 / 幸福 / 快樂 是我們共同的心願
微笑 / 服務 / 品質 是我們共同的目標

豐原醫院
Feng-Yuan Hospital
Department of Health

Appendix 9

Fong Yuan Hospital Department of Health

Approval of Human Subjects Research

Date: April 30, 2009

The study "Maternal attitudes related to infant feeding and breastfeeding behaviors in Taiwan" was approved by the Fong Yuan IRB review on April 30, 2009.
This approval expires on December 31, 2009.
Fong Yuan Hospital Department of Health

Office of Research Subjects Protection
Primary Reviewer
Chen, Chun-Lieh

Appendix 10

The IIFAS scale including demographic information

1. Part I : The IIFAS Scale

For each of the following statements, please indicate how much you agree or disagree by circling the number that most closely corresponds to your opinion (1=strong disagreement (SD), 2=disagreement (D), 3=neutral (N), 4=agreement (A), 5=strong agreement (SA)). You may choose any number from 1 to 5.

	SD	D	N	A	SA
1. The nutritional benefits of breast milk last only until the baby is weaned from breast milk.	1	2	3	4	5
2. Formula-feeding is more convenient than breastfeeding.	1	2	3	4	5
3. Breast-feeding increases mother-infant bonding.	1	2	3	4	5
4. Breast milk is lacking in iron.	1	2	3	4	5
5. Formula-fed babies are more likely to be overfed than are breast-fed babies.	1	2	3	4	5
6. Formula-feeding is the better choice if a mother plans to work outside the home.	1	2	3	4	5
7. Mothers who formula-feed miss one of the great joys of motherhood.	1	2	3	4	5
8. Women should not breast-feed in public places such as restaurants.	1	2	3	4	5
9. Babies fed breast milk are healthier than babies who are fed formula.	1	2	3	4	5
10. Breast-fed babies are more likely to be overfed than formula-fed babies.	1	2	3	4	5
11. Fathers feel left out if a mother breast-feeds.	1	2	3	4	5
12. Breast milk is the ideal food for babies.	1	2	3	4	5
13. Breast milk is more easily digested than formula.	1	2	3	4	5
14. Formula is as healthy for an infant as breast milk.	1	2	3	4	5
15. Breast-feeding is more convenient than formula feeding.	1	2	3	4	5

16. Breast milk is less expensive than formula.	1	2	3	4	5
17. A mother who drinks alcohol once a week should not breast-feed her baby.	1	2	3	4	5

2. Part II : Demographic information

1. Age _____
2. Education (1) senior high school or lower (2) college (3) university (4) graduate or above.
3. Marital status (1) married (2) divorced or separated (3) single.
4. Family annual income refers to the total parental income per year (1) below 400,000 (2) 400,000-600,000 (3) 600,001-1,000,000 (4) more than 1,000,000.
5. Employment status (1) return to work after maternity leave (2)do not work.
6. Parity (1) first birth (2) second birth (3) third or higher birth.
7. Baby sex (1) female baby (2) male baby
8. Previous breastfeeding (1) yes (2) no.
9. If you have previous breastfeeding, please answer this question the previous breastfeeding experience (1) good (2) not good
10. Method of delivery (1) cesarean section (2) vaginal delivery.

Appendix 10

母乳哺餵態度量表包含人口學資料

第一部分: 母乳哺餵態度量表

下列每一題敘述中，請依照你自己的意見，圈選出同意或不同意的程度。1=非常不同意, 2=不同意, 3=沒意見, 4=同意 , 5=非常同意 。妳可以選擇任何的數字由 1 至 5。

	問卷題目	非常不同意	不同意	沒意見	同意	非常同意
1	母奶的營養好處僅持續到嬰兒斷奶為止。	1	2	3	4	5
2	餵食配方奶比哺餵母奶方便。	1	2	3	4	5
3	哺餵母奶增進母嬰之間的關係。	1	2	3	4	5
4	母乳缺乏鐵質。	1	2	3	4	5
5	餵食配方奶比哺餵母奶更可能過度餵食。	1	2	3	4	5
6	假如母親需要外出工作，餵食配方奶是比較好的選擇。	1	2	3	4	5
7	餵食配方奶的母親會錯失身為母親的一大樂趣。	1	2	3	4	5

8	女人不應該在公共場所哺餵母奶，比如在餐廳。	1	2	3	4	5
9	餵母奶的嬰兒比餵配方奶的嬰兒還要健康。	1	2	3	4	5
10	哺餵母奶比餵食配方奶更可能過度餵食。	1	2	3	4	5
11	假如母親哺餵母奶，父親會覺得被忽略。	1	2	3	4	5
12	母乳對嬰兒是理想的食物。	1	2	3	4	5
13	母奶比配方奶更容易消化。	1	2	3	4	5
14	對嬰兒而言，配方奶和母奶一樣健康。	1	2	3	4	5
15	哺餵母奶比餵食配方奶方便。	1	2	3	4	5
16	母奶比配方奶便宜。	1	2	3	4	5
17	每週喝酒一次的母親不該哺餵母奶。	1	2	3	4	5

第二部分: 基本資料

1. 年齡:___
2. 教育: (1) 高中或高中以下 (2) 專科 (3) 大學 (4) 研究所或研究所以上
3. 婚姻狀況 (1) 已婚 (2) 離婚或分居 (3) 未婚
4. 家庭年收入 (1) 400,000 以下 (2) 400,000-600,000 (3)600,001-1,000,000 (4) 1,000,000 以上
5. 職業狀況 (1)做完月子後，將返回工作 (2) 沒有工作
6. 這次的胎次 (1) 第一胎 (2) 第二胎 (3) 第三胎或第三胎以上
7. 嬰兒性別 (1) 女生 (2) 男生
8. 之前曾哺餵母乳 (1) 是 (2) 否
9. 若妳之前曾哺餵母乳，請回答這一題
   之前哺餵母乳的經驗是(1)好的 (2) 不好的
10. 生產方式 (1) 剖腹產 (2) 陰道生產

Appendix 11

Recommendations for the Cross-Cultural Adaptation of IIealth Status Measures

Contributors to this Document:
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Francis Guillemin
Marcos Bosi Ferraz

Supported by the
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Institute for Work & Health

Revised March 2002

Table of Contents

Introduction

With the increase in the number of multi-national and multi-cultural research projects, the need to adapt health status measures for use in other than the source language has also grown rapidly. Most questionnaires are developed in English speaking countries (Guillemin, 1993), but even within these countries, researchers must consider immigrant populations in studies of health especially when their exclusion could lead to a systematic bias in studies of health care utilization or quality of life (Guillemin, 1993).

The cross-cultural adaptation of a health status self-administered questionnaire for use in a new country, culture and/or language requires a unique methodology in order to reach equivalence between the original source and target languages. It is now recognized that if measures are to be used across cultures, the items must not only be translated well linguistically, but also be adapted culturally in order to maintain the content validity of the instrument across different cultures. In this way, we can be more confident that we are describing the impact of a disease or its treatment in a similar manner in multi-national trials or outcome evaluations. The term "cross-cultural adaptation" is used to encompass a process which looks at both language (translation) and cultural adaptation issues in the process of preparing a questionnaire for use in another setting.

Cross-cultural adaptations should be considered important to do in several different scenarios, in some cases this is more obvious than in others. Guillemin (1993) suggests five different examples of when attention should be paid to this adaptation by comparing the target (where it is going to be used) and source (where it was developed) language and culture. The first scenario is that it is to be used in the same language and culture in which it was developed. No adaptation is necessary. The other scenarios are summarized in Table 1, and reflect situations when some translation and/or adaptation will be required.

Table 1. Possible scenarios where some form of cross-cultural adaptation is required (adapted from Guillemin, 1993).

Wanting to use a questionnaire in a new population described as follows:		Results in a change in.....			Adaptation Required	
		Culture	Language	Country of use	Translation	Cultural adaptation
A	Use in same population. No change in culture, language or country from source	---	---	---	---	---
B	Use in established immigrants in source country	•	---	---	---	•
C	Use in other country, same language	•	---	•	---	•
D	Use in new immigrants, not English speaking, but in same source country	•	•	---	•	•
E	Use in another country and another language.	•	•	•	•	•

The guidelines described in this document are based on a review of cross-cultural adaptation in the medical, sociological and psychological literature. This review led to the description of a thorough adaptation process aiming to maximize the attainment of semantic, idiomatic, experiential and conceptual equivalence between the source and target questionnaires (Guillemin, 1993). Further experience in cross-cultural adaptation of generic and disease-specific instruments, and alternative strategies driven by different research groups (Leplege A, 1994) have led to some refinements in the methodology since the 1993 publication. These changes make the process a little more time consuming; however the benefit is that the end product will be of better quality in terms of content and face validity.

The objective of the American Academy of Orthopaedic Surgeons (AAOS) is to provide guidelines for translating and adapting one or more of the AAOS outcome measures for use in another country, language or culture. In this way, potential users of the instrument can verify first, whether they need to go through the cross-cultural adaptation process, and second, how they should proceed with the adaptation.

These guidelines will serve as a template for the adaptation process. The process involves the adaptation of individual items, the instructions for the questionnaire, response options and the scoring documentation. The text in the next section outlines the methodology suggested (Stages I - V). The subsequent section suggests an appraisal process whereby an advisory committee to the AAOS will assess whether or not the procedure recommended has been followed (Stage VI). If it has, it will be assumed that this is a satisfactory translation/adaptation of the questionnaire and the version will be approved as an "official" translation.

The process of cross-cultural adaptation strives to produce equivalency based on content. This suggests the other statistical properties such as internal consistency, validity and reliability might be retained. However, this is not necessarily the case. For example, if the new culture has a different way of doing a task included within a disability scale that makes it inherently more or less difficult to do relative to other items in the scale, the validity would likely change, particularly in terms of item-level analyses (such as item response theory, Rasch). Further testing should be done on an adapted questionnaire to verify the psychometric properties. Interesting research is ongoing in Europe, where an urgent need is being addressed to have health status measures available to use across the many countries.

Guidelines for the cross-cultural adaptation process.

The following figure outlines the cross-cultural adaptation process being recommended by the AAOS Evidence Based Medicine Committee. Each stage in the process, including a summary of resources needed and reports required by the AAOS, is described in detail below. AAOS approval of the final version of the outcome measure is dependent on provision of enough evidence that the described stages have been successfully followed in the adaptation process.

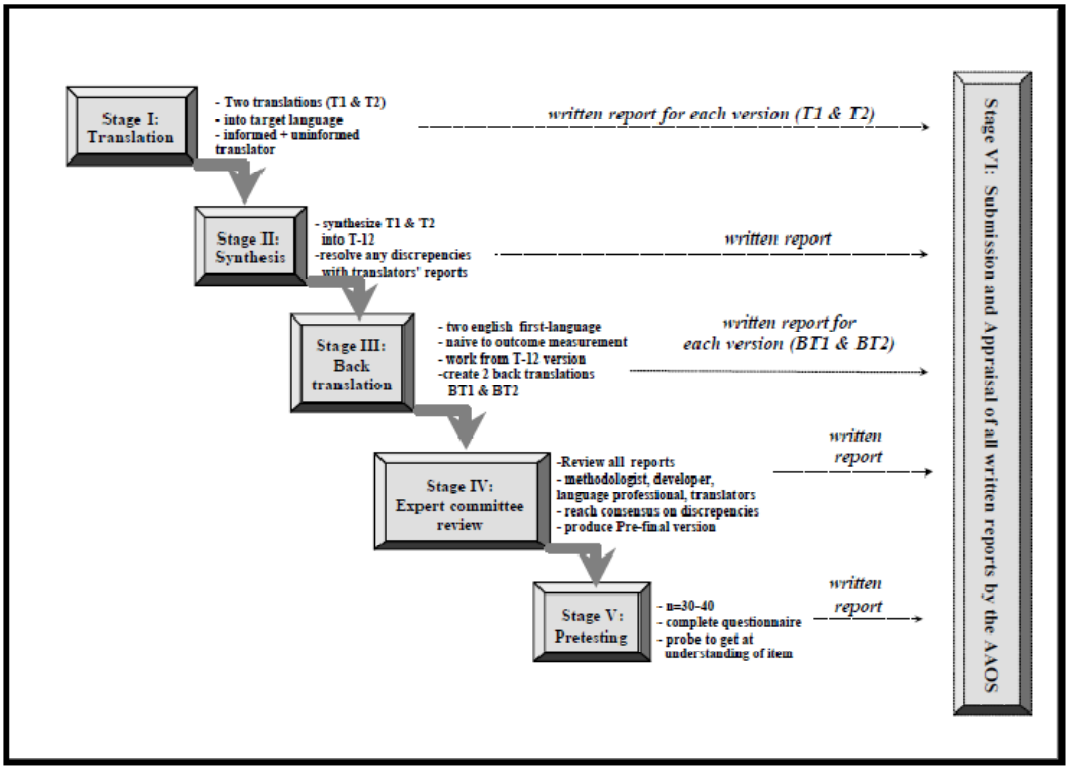

Figure 1. Graphic representation of the stages of cross-cultural adaptation recommended for approval of a translated version of an outcome measure by the AAOS.

Stage I: Initial Translation:

The first stage in adaptation is the forward translation. At least two forward translations should be made of the instrument from the original language (source language) to the target language. In this way, the translations can be compared, and discrepancies which may reflect ambiguous wording in the original language, or discrepancies in how a word is translated can be identified. Poorer wording choices can then be discussed and resolved as the best translation between the translators.

The two independent translations are produced by bilingual translators who have the target language as their

mother tongue. Translations into the mother tongue, or first language of the translator, are more likely to accurately reflect the nuances of that language (Hendricson, 1989).

The translators each produce a written report of the translation which they did. Comments are included to highlight challenging phrases or uncertainties along with the rationale for final choices. Item content, response options, instructions and scoring documentation are all translated using the same process.

The two translators should have different profiles or backgrounds to ensure the best possible translation.

Translator # 1: One of the translators should be knowledgeable about the type of concepts the questionnaire being translated addresses (e.g., functional disability or neck and shoulder disorders). Translator #1 adaptations will be aimed at equivalency from a more clinical perspective, and may produce a translation that is a more reliable equivalence to the original from a measurement perspective.

Translator # 2: The other translator should neither be aware nor be informed of the concepts being quantified, and preferably have no medical/clinical background. As the so-called "naive" translator, he or she is more likely to detect the more subtle differences in meaning of the original than the first translator. Translator #2 should not be influenced by an academic goal, and offer a translation that reflects the language used by the common population. This second translation will often highlight more ambiguous meanings in the original questionnaire than is found in the first translation (Guillemin, 1993).

Stage II: Synthesis of these translations.

To produce a synthesis of the two translations, a third, unbiased person is added to the team. The role of this person is to serve as a mediator in discussions of translation differences, and to produce a written documentation of the process. Working from the original questionnaire as well as the first translator's version (T1) and the second translator's (T2), a synthesis of these translations is produced, resulting in one common translation (T-12). A written report carefully documenting the synthesis process, each issue addressed, and how it was resolved is completed. It is important that all issues be resolved by consensus rather than one person compromising their feelings.

Stage III: Back-translation:

Working from the T-12 version of the questionnaire, and totally blind to the original version, the questionnaire is then translated back into the original language. This is a process of validity checking to make sure the translated version accurately reflects the item content of the original version. The back translation process often magnifies unclear wording in the translations. However, agreement between the back translation and the original source version does not guarantee a satisfactory forward translation version (T-12), as an incorrect, but consistent translation could occur (Leplege, 1994). Back translation is only one type of validity check, and is best at highlighting gross inconsistencies or conceptual errors in the translation.

As with forward translations, two back-translations are considered a minimum. The back-translations (BT1 and BT2) are produced by two bilingual persons with the source language (English) as their mother tongue. The two

translators should neither be aware nor be informed of the concepts explored, and preferably without medical background. The main reasons for this are to avoid information bias and to elicit unexpected meanings of the items in the translated questionnaire (T-12) (Guillemin, 1993; Leplege, 1994), thus increasing the likelihood of "highlighting the imperfections"(Leplege, 1994).

Stage IV: Expert Committee:

The composition of the Expert Committee is crucial to achieving cross-cultural equivalence of the translated instrument. The minimum composition of the Expert Committee includes at least one each of a methodologist, health professional, language professional, as well as all translators (both forward and backward) and the translation synthesis recorder. The original developers of the questionnaire should be in close contact with the Expert Committee during this part of the process to respond to questions and provide input.

The Expert Committee's role is to consolidate all the versions and components of the questionnaire, including the original instrument, instructions, scoring documentation, and all translated versions (T1, T2, T12, BT1, BT2), and develop the pre-final version of the questionnaire for field testing. The Committee will review all of the translations and reach a consensus on any discrepancy found. Corresponding written reports explaining the rationale of each decision at earlier stages of the process should also be available.

Critical decisions are made by the Expert Committee in finalizing the translated instrument, and full written documentation should be made of the issues and rationale for all decisions about any of the components (instrument, instructions or scoring).

Decisions will need to be made by this Committee to achieve equivalence between the source and target version in four areas (Guillemin, 1993):

> **Semantic equivalence**: Do the words mean the same thing? Are their multiple meanings to a given item? Are there grammatical difficulties in the translation?
>
> **Idiomatic equivalence**: Colloquialisms, or idioms, are difficult to translate. The committee may have to formulate an equivalent expression in the target version. For example the term "feeling downhearted and blue" from the SF-36 has often been difficult to translate, and an item with similar meaning would have to be found by the Committee.
>
> **Experiential equivalence**: Items seeking to capture and experience of daily life often vary in different countries and cultures. In some instances, a given task may simply not be experienced in the target culture, even if it is translatable. To address this situation, a questionnaire item addressing a similar action or intent in the target culture would need to be identified to replace the original item. For example, the question "do you have difficulty eating with a fork?" may need to be replaced with another utensil, such as a chopstick, if that is the common utensil used for eating in the target culture.
>
> **Conceptual equivalence**: Often words hold different conceptual meaning between cultures. For instance, the meaning of "seeing your family as much as you would like" would differ between cultures

based on the concept of what defines "family" (i.e., nuclear versus extended family).

The Expert Committee will need to examine the source and back-translated questionnaires for all of these types of equivalence items. Consensus among Committee members should be reached on all items, and if necessary, the translation/back translation process repeated to clarify how another wording of an item would work. The advantage of having all translators present on the Committee is that discrepancies or changes in wording could be done immediately. Items, instructions , response options and scoring documentation must all be considered. The final questionnaire should be able to be understood by the equivalent of a 12-year-old (roughly a grade six level of reading), as this is the general recommended reading level for questionnaires.

Stage V: Test of the pre-final version:

The final stage of the adaptation process is the pretest. This field test of the new questionnaire uses the pre-final version with subjects/patients, ideally between 30 and 40 persons, from a target setting.

Each subject first completes the questionnaire, and is then interviewed to probe what they thought was meant by each questionnaire item and their response. Both the meaning of the items and responses would be explored. This ensures that the adapted version is still retaining its equivalence in an applied situation. The distribution of responses is examined to look for a high proportion of missing items or single responses.

The results of this stage are summarized and submitted with the other documents to the AAOS Committee for review.

It should be noted, that while this stage does provide some useful insight into how an individual person interprets the items on the questionnaire, it does not address the construct validity, reliability or item response patterns which are also critical to describing a successful cross-cultural adaptation. The described process provides for some measure of quality in the content validity. Additional testing for the retention of the psychometric properties of the questionnaire is highly recommended, however not required for approval of the translated version. This is in keeping with other guidelines for the translation and adaptation of other measures.

Stage VI: Submission of documentation to the AAOS Committee for Appraisal.

The final stage in the adaptation process is a submission of all the reports and forms to the AAOS Committee. The Committee will check for verification that the recommended stages were followed, and that the reports seem to reflect this process well. In effect, this is a process audit to ensure that all the steps were followed and necessary reports written and submitted It is *not* the responsibility of this Committee and review process to alter the content; it will be assumed that by following the prescribed process that a reasonable translation has been achieved.

Once the appraisal is complete, the AAOS Evidence Based Medicine Committee will render one of three decisions: 1) approved, 2) translation and documentation requires clarification, or 3) not approved. In the case of the second response, the applicants will have the opportunity to resubmit their application with the needed

revisions. If approved, the adapted version of the questionnaire will be considered the "authorized" translation and will be made available to others who might be able to make use of it.

Common Questions & Answers

Can I avoid the translation process by just working on cultural adaptation from a version already available in my language, but in a different culture/country?

The first thing to do is to see if the previously adapted version has cultural equivalency in your population. This can be done by pretesting the adapted version in a sample of your patients and then probing (speaking to the patients in detail) as to the meaning and relevance of the items. If there are any concerns (e.g., consistently missing items, or reported confusion over a given question) then a cross-cultural adaptation should be done. It is recommended to start with the original US-English version of the questionnaire for this process in order to be as close to the original as possible with the final product.

Why do I need to go through this extensive process?

Although this seems like a lot of work, following the guidelines produces a questionnaire which should be close to the original questionnaire. Having a cross-culturally adapted health outcome measure means that one is closer to having equivalent "rulers" to measure health across different cultural groups. This would mean that multinational studies could use the same health status measure, or patients who speak different languages could still be contributing to the outcome database or case series review in a clinical practice. Exclusion of these patients because of their lack of ability to complete a questionnaire in English is a concern as they may not have the same results (ie, satisfaction with care) as native language speakers. As a result, any quality improvement activities may exclude their perspective by necessity.

What about the reliability and validity of the new version?

Cross-cultural adaptation tries to ensure a consistency in the content and face validity between source and target versions of a questionnaire. It should therefore follow that the resultant version should have sound reliability and validity if the original version did. However, this is not always the case, perhaps because of subtle differences in the way things are done in different cultures that render an item more or less difficult than other items in the questionnaire. Such changes may alter the statistical or psychometric properties of an instrument.

It is highly recommended that after an adaptation process, investigators ensure that the new version has demonstrated the measurement properties needed for the intended application. Describing a group of patients with a given condition requires strong evidence of construct validity (is it measuring what it is supposed to be measuring?). Evaluating change over time requires not only construct validity, but also test-retest reliability (do the score's stay the same when the patients have not changed?) and responsiveness (ability to detect change when it has occurred).

It is possible to work some of these tests of reliability and validity into the pre-testing process (stage V of the adaptation). If this has been done, include the results of that analysis in your final report.

Why isn't the AAOS doing all the translations and adaptations?

The answer is quite simple: the AAOS would have no idea which instrument or language to do first, and where to stop. By providing the guidelines, the market is taking the lead in terms of what adaptations have priority and are being used. This allows clinicians and researchers to move ahead with the adaptation process. It also makes the process easier in that the individual countries likely have access to the translators and back-translators in their communities more readily than the AAOS would be able to assemble such a committee.

What if I don't do the whole adaptation process, and/or don't submit my reports to the AAOS for appraisal?

Of course, the choice to follow these recommendations is up to you. However, the main implication is in the copyright. The final approval of the translated version (using the appraisal of the adaptation process described in these guidelines) is required for that version to be considered the "official" translation of the instrument for the language/culture. Only official, approved versions may use the name AAOS, or the specific name of the instrument, such as the DASH. The names themselves are under copyright. We would ask that you respect that copyright and follow the guidelines for quality translation. However if you refuse to do so, we ask that you refrain from using the name DASH, AAOS or COMSS with an unapproved version, even if you call it "modified" (e.g. you cannot use the term Modified-DASH).

What about translations of the instruments (like the DASH) that are already in circulation?

The AAOS and the Institute for Work & Health have discussed the cross-cultural adaptation process with several researchers in various countries. The process is also available in the literature in a slightly more detailed format (Guilleman, 1993). There are, therefore, versions that have pretty much followed these guidelines already, and others that have not. The already translated versions will be appraised in the same manner as is being suggested in these guidelines. Researchers will be asked to submit documentation of their translation process if they wish to use the name of the instrument or refer to the AAOS when describing their outcome measures in any way.

How do I get an "official" adapted version of a questionnaire?

The AAOS and the Institute for Work & Health (the latter for the DASH only) will be keeping an ongoing list of the approved versions of the questionnaire that are available in different languages or cultures. These will be made available for others to use in the same way that the outcome measures are currently made available.

References:

Guillemin F, Bombardier C, Beaton D. Cross-cultural adaptation of health-related quality of life measures: Literature review and proposed guidelines. *Journal of Clinical Epidemiology* 1993; 46: 1417-1432.

Hendricson, WD, Russel IJ, Jacobson JM, Rogan H, Bishop GD, Castill R. Development and initial validation of a dual language English-Spanish format for the Arthritis Impact Measurement Scales. Arthritis Rheum 1989;32:1153-1159.

Leplège A, Verdier A. The adaptation of health status measures. A discussion of certain methodological aspects of the translation procedure. *In*: Shumaker S, Berzon R, Ed. *The international assessment of health-related quality of life: Theory, translation, measurement and analysis*. Rapid communications of Oxford, Oxford, 1994.

Anderson RT, Aaronson NK and Wilkin D. Critical review of the international assessments of health -related quality of life generic instruments. *In*: Shumaker S, Berzon R, Ed. *The international assessment of health-related quality of life: Theory, translation, measurement and analysis*. Rapid communications of Oxford, Oxford, 1994.

Acknowledgements: This document was based in large part on the work of Guillemin et al (1993). Readers are encouraged to review this article for more details on the development of this process, and the literature review conducted to do so.

VCU Memo

Virginia Commonwealth University

Office of Research Subjects Protection
BioTechnology Research Park
BioTech One, 800 E. Leigh Street, #114
P.O. Box 980568
Richmond, Virginia 23298-0568
(804) 828-3992
(804) 827-1448 (fax)

DATE: October 15, 2009

TO: Jacqueline M. McGrath, PhD
School of Nursing
Box 980567

FROM: Lisa M. Abrams, PhD
Chairperson, VCU IRB Panel B
Box 980568

RE: **VCU IRB #: HM12488**
Title: Maternal Attitudes in Infant Feeding to Breastfeeding Behavior in Taiwan

On October 15, 2009, the following research study was ***approved*** by expedited review according to 45 CFR 46.110 Category 7. The approval reflects the revisions received in the Office of Research Subjects Protection on October 13, 2009. This approval includes the following items reviewed by this Panel:

RESEARCH APPLICATION/PROPOSAL: None

PROTOCOL (Research Plan): Maternal Attitudes Related to Infant Feeding and Breastfeeding Behaviors in Taiwan, received 10/13/09, version date 10/13/09

- The Iowa Infant Feeding Attitude Scale (Appendix 2 – *English version*), received 9/17/09, version 1, dated 9/15/09
- The Iowa Infant Feeding Attitude Scale – Testing of Comparability/Interpretability (Appendix 3 – *English version*), received 9/17/09, version 1, dated 9/15/09
- The Iowa Infant Feeding Attitude Scale – Testing of Comparability/Interpretability (Appendix 4 – *Chinese version*), received 9/17/09, version 1, dated 9/15/09
- The Iowa Infant Feeding Attitude Scale – Cultural Relevance Rating(*English version*), received 9/17/09, version 1, dated 9/15/09
- The Iowa Infant Feeding Attitude Scale – Cultural Relevance Rating(Appendix 5 – *Chinese version*), received 9/17/09, version 1, dated 9/15/09
- The Iowa Infant Feeding Attitude Scale including Demographic Information (Appendix 10 – *English version*), received 9/17/09, version 1, dated 9/15/09
- The Iowa Infant Feeding Attitude Scale including Demographic Information (Appendix 10 – *Chinese version*), received 9/17/09, version 1, dated 9/15/09
- Recommendations for the Cross-Cultural Adaptation of Health Status Measures (Appendix 11), received 9/17/09, version 1, dated 9/15/09

(Continued...)

CONSENT/ASSENT (attached):

- Informational Letter (Appendix 6 – *English version*), received 9/17/09, version 1, dated 9/15/09, 1 page
- Informational Letter (Appendix 6 – *Chinese version*), received 9/17/09, version 1, dated 9/15/09, 1 page
- Waiver of Some Consent Elements: All four conditions for waiver of consent have been met. See §45 CFR 46.116(d). The IRB Panel has waived the following elements of consent: Description of any Reasonably Foreseeable Risks or Discomforts to the Subject (§46.116(a)(2)), Description of any Benefits (§46.116(a)(3)), Disclosure of Alternative Procedures (§46.116(a)(4)).
- Waiver of Documentation of Consent: One of the conditions set forth in 45 CFR 46 117(c) (1), (2) for waiver of documentation of consent has been met and the IRB Panel has waived documentation of consent.

ADDITIONAL DOCUMENTS (attached):

- Follow-Up Phone Script (Appendix 7 – *English version*), received 9/17/09, version 1, dated 9/15/09
- Follow-Up Phone Script (Appendix 7 – *Chinese version*), received 9/17/09, version 1, dated 9/15/09

This approval expires on September 30, 2010. Federal Regulations/VCU Policy and Procedures require continuing review prior to continuation of approval past that date. Continuing Review report forms will be mailed to you prior to the scheduled review.

The Primary Reviewer assigned to your research study is Ann Allen, PhD. If you have any questions, please contact Dr. Allen at aallen@richmond.k12.va.us; or you may contact Jennifer Rice, IRB Coordinator, VCU Office of Research Subjects Protection, at jlrice@vcu.edu and 828-3992.

[Attachment – Conditions of Approval]

Conditions of Approval:

In order to comply with federal regulations, industry standards, and the terms of this approval, the investigator must *(as applicable):*

1. Conduct the research as described in and required by the Protocol.

2. Obtain informed consent from all subjects without coercion or undue influence, and provide the potential subject sufficient opportunity to consider whether or not to participate (unless Waiver of Consent is specifically approved or research is exempt).

3. Document informed consent using only the most recently dated consent form bearing the VCU IRB "APPROVED" stamp (unless Waiver of Consent is specifically approved).

4. Provide non-English speaking patients with a translation of the approved Consent Form in the research participant's first language. The Panel must approve the translated version.

5. Obtain prior approval from VCU IRB before implementing any changes whatsoever in the approved protocol or consent form, unless such changes are necessary to protect the safety of human research participants (e.g., permanent/temporary change of PI, addition of performance/collaborative sites, request to include newly incarcerated participants or participants that are wards of the state, addition/deletion of participant groups, etc.). Any departure from these approved documents must be reported to the VCU IRB immediately as an Unanticipated Problem (see #7).

6. Monitor all problems (anticipated and unanticipated) associated with risk to research participants or others.

7. Report Unanticipated Problems (UPs), including protocol deviations, following the VCU IRB requirements and timelines detailed in VCU IRB WPP VIII-7):

8. Obtain prior approval from the VCU IRB before use of any advertisement or other material for recruitment of research participants.

9. Promptly report and/or respond to all inquiries by the VCU IRB concerning the conduct of the approved research when so requested.

10. All protocols that administer acute medical treatment to human research participants must have an emergency preparedness plan. Please refer to VCU guidance on http:/www.research.vcu.edu/irb/guidance.htm.

11. The VCU IRBs operate under the regulatory authorities as described within:
    a) U.S. Department of Health and Human Services Title 45 CFR 46, Subparts A, B, C, and D (for all research, regardless of source of funding) and related guidance documents.
    b) U.S. Food and Drug Administration Chapter I of Title 21 CFR 50 and 56 (for FDA regulated research only) and related guidance documents.
    c) Commonwealth of Virginia Code of Virginia 32.1 Chapter 5.1 Human Research (for all research).

[010507]

Appendix 6

Dear mothers

Congratulation on your new baby!! You are being asked to participant in a nursing study. We hope to learn about how maternal attitudes affect mothers' feeding choice. You are being asked to participate in this study because you have been hospitalized for childbirth and have chosen to breastfeed your baby in the hospital.

If you decide to participate in the project, you will need to complete a survey before you go home from the hospital. You will also be asked to provide your name and telephone number on a separate form so that we can contact you regarding how breastfeeding is going for you and your baby at the third week and sixth week postpartum. We will only use your name and phone number to contact you for the study. No one else but the study personnel will have access to your name and phone number. The survey and 2 phone calls will each take only about 10 minutes of your time. In the phone calls, you may be asked to provide reasons for why you did not continue breastfeeding your baby. We also will be asking questions about the type of support you received from family and friends during this time.

If you decide to participate please complete the attached survey and return it in the enclosed envelope. Your decision, whether or not to participate will not affect the care that you receive from Fong-Yuan Hospital. If you decide to participate, you are not obligated to answer all questions, and may stop at any time or refuse to participate in the phone calls, we will only be calling your twice after go home.

Questions about your rights as a volunteer in research can be directed to Virginia Commonwealth University's Human Subjects Research Review Committee at 0021-804-827-2157and Fong-Yuan Hospital's Human Subjects Research Review Committee at 04-25271180

Your voluntary completion of the survey constitutes consent to participant. Thanks you for assisting us with this study.

Sincerely,

Jacqueline M. McGrath / Yen-Ju Ho

APPROVED

10-15-09 / ASA / JR

Appendix 6

親愛的媽媽們您好

恭喜妳有了新寶寶了! 您被邀請參與在一個護理研究。我們希望能了解媽媽的態度如何影響其哺乳的選擇。您被邀請參與在這個研究，因為您是因生產而住院而且在醫院中選擇了哺餵母乳。

假如您決定參與在這個研究，在您出院回家之前，您將需要完成一份問卷。而且在另一分開的表格，您將被要求去提供您的名字和電話，如此我們可以在您產後第三週和第六週，能連絡您關於母乳哺餵的情形。您的名字和電話將只為了研究目的，而作為聯絡使用。除了研究人員沒有其它人可以使用您的名字和電話。這個問卷和每次的電話訪談將只花費您約十分鐘的時間。在電話訪談中，您將被詢問關於為什麼您沒有持續哺餵母乳的理由。我們也將詢問您在這段期間，從家人和朋友中，接受到何種的支持。

如果您決定參與在這個研究，請完成這份問卷，並放入密封的信封中交回。不管您決定參與或不參與，將不會影響您從豐原醫院中所接受到的照護。假如您決定參與在這個研究，您將不會被強迫去回答全部的問題，您可以隨時停止回答或拒絕參與在之後的電話訪問。

關於您的權利，如果您有任何的問題，可以聯絡維吉尼亞聯邦大學的人體試驗委員會 0021-804-827-2157 或署立豐原醫院的人體試驗委員會 04-25271180。

謹致

Jacqueline M. McGrath/何豔如

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Appendix 7

Hello,
Are you _____ (confirm that you are talking to the right person)
My name is Yen Ju Ho and I am nursing student at Virginia Commonwealth University and I am studying the effects of maternal breastfeeding attitudes. Remember that I spoke with you about a breastfeeding nursing study at the hospital and that I would be calling you in a few weeks to follow-up?

I am calling to follow-up with a few questions related to how breastfeeding is going for you and your baby? Is it OK if we talk for a few minute? You do not have to continue participation but it would be very helpful to me if you did.

I only have a few questions and this discussion should only take about 10 minutes of your time. If not is there a better time for me to call you back? Or, would you like to discontinue your participation in this study? By continuing with this discussion you are providing your consent to continue participation in this study. I appreciate the time you are taking to speak to me.
(once they agree I will continue)
How are you? How is your baby doing?

I would like to ask you about your infant feeding method now. Are you still breastfeeding? (If the mother change feeding method form breastfeeding to bottle feeding, they are asked an open-ended question to provide the reasons regarding weaning.)
The question is "what are the reasons you chose to stop breastfeeding?"

(They also are asked two open-ended questions about the support they received.)
"as you look back over the time you have breastfeed, who has been supportive to you since baby's birth?" (such as family or friends)
"what type of support you received ?" (such as encouragement or caregiving help)
Is there anything else about your breastfeeding experience that you would like to share with me?

"Thank you for your time and participation in this study. I appreciate the information you have shared with me."

If this is the first of the two planned calls I will also remind them about when I will be calling again to complete the study.

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Appendix 7

哈囉

您是 _____ (確定是和要找的人說話)

我的名字是何豔如，是維吉尼亞聯邦大學的學生，目前正在研究母親哺乳態度的影響。還記得我在醫院中曾和您談過的護理研究和我將會在您出院幾週後打電話追蹤嗎?

我打電話給您是要問您一些問題關於您母乳哺餵的情形如何? 您方便談話幾分鐘嗎? 您可以不必持續參與，不過，如果您參與，將是對我非常有幫助的。

我只有幾個問題，大約只花費您十分鐘的時間。如果現在您不方便，什麼時候我可以打電話和您訪談? 或您不想再持續參與了? 如果您願意持續這個討論，代表您同意持續參與在這個研究。謝謝您花時間接受訪談。(一但他們同意參與，我將持續問以下的問題)

您好嗎? 您的寶寶好嗎?

我想要詢問有關您寶寶現在餵食的方法。您持續哺餵母乳嗎?

(假如媽媽改變餵食方法從哺餵母乳到餵處方奶)

另一個問題是 " 您停止哺餵母乳的理由是什麼?"

(他們也被問二個問題關於他們所接受到的支持)

"在這一段您哺餵母乳的期間，誰支持您哺餵母乳?" (像是家人或朋友)

"您接受到哪種支持?" (像是鼓勵您或給您照顧上的幫忙)

您還有其它的哺乳經驗，想要和我分享的嗎?

謝謝您花的時間和參與在這個研究。我很感謝您所提供的訊息。

(假如這是二次電話訪談的其中一次，我也將提醒他們關於何時我還會再打電話和他們訪談。)