

**Job Strain, Social Support, Coping Strategies, and Psychological Distress  
among Pregnant Thai Women**

BY

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This dissertation is dedicated to my family, who supported me and encouraged me to pursue my dream. Additional dedication goes to the pregnant Thai women that have inspired me to develop this study and provided me with the opportunity to establish future research in this area.

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## SUMMARY

This dissertation consists of two different manuscripts which were developed from the same study. Full-time employed pregnant women ( $N = 300$ ) were recruited from three antenatal clinics in Thailand. The Thai versions of the following instruments were used: the State-Anxiety Inventory and CES-D (psychological distress); the Job Content Questionnaire (job strain and workplace support); the Medical Outcome Study-Social Support Survey (family support); and the Ways of Coping Checklist–Revised (coping strategies). Since the data were collected soon after the significant flood in Thailand, participants were also queried concerning the impact of the flood. The two parts of the informed consent were: 1) willingness to participate in the study, and 2) allowing the research team to access the delivery records to collect birth outcome data (infant birth weight and gestational age). After providing a written informed consent, participants completed the questionnaires in a private room in the hospital, which took about 20-40 minutes. Birth outcomes were retrieved from the delivery records.

The first manuscript is a cross-sectional descriptive study focusing on the relationship between job strain and psychological distress among employed pregnant Thai women. The study also examined the moderating effects of perceived workplace support, family support, and coping strategies on the relationship between job strain and psychological distress. The study findings contributed to the existing literature in that job strain is a significant factor contributing to psychological distress in employed pregnant women. Assessing psychological distress should be integrated as a part of standard prenatal care. Interventions that emphasize enhancing appropriate coping strategies would be beneficial for employed pregnant women.

## **SUMMARY (continued)**

The second manuscript deals with the fact that one of the research sites was directly affected by the flood; 72% of the participants (152 out of 210) recruited from that site experienced displacement during the flood. The 2011 flood provided a unique opportunity to examine the impact of displacement on birth outcomes and the moderating effect of perceived social support on its relationship. The study findings indicated that the mean infant birthweight of displaced women was significantly lower than that of non-displaced women, while the infant gestational age was not different. The prevalence of antenatal depressive symptoms among displaced and non-displaced women also was not different. Perceived social support had a moderating effect on infant birthweight, particularly among the displaced women. The findings suggest that enhancing social support would help protect pregnant women from the negative consequences of the flood. Healthcare providers should pay more attention to displaced women in terms of maternal weight gain and fetal growth development.

## **I. INTRODUCTION**

The dissertation study was originally designed to determine the effect of job strain on psychological distress among employed pregnant Thai women. However, just before collecting the data, there was a significant flood in Thailand. Therefore, the study was also extended to examine the effect of the flood on birth outcomes within this population. The findings are presented into two manuscripts that focus on different aspects of the study. Following are the background, purposes, and significance of the study.

### **A. Background**

In Thailand, almost 14 million women of reproductive age (15 - 44 years) participate in the labor force (e.g. service workers, agricultural production, commercial manufacturing) (National Statistical Office, 2009). High rates of job strain, the joint effects of high psychological demand and low decision latitude over the conditions of work, have been reported among Thai workers, including women in their reproductive years (Sein, Howteerakul, Suwannapong, & Jirachawee, 2010). High job strain is significantly related to psychological distress among women in many industrialized countries (Bourbonnais, Comeau, Vezina, & Dion, 1998; Lin, Probst, & Hsu, 2010; Virtanen et al., 2007). Psychological distress during pregnancy is associated with negative health consequences for women and their infants (e.g. adverse birth outcomes, postpartum depression, and delayed child development) (Andersson, Sundström-Poromaa, Wulff, Åström, & Bixo, 2004; Field et al., 2004; Hedegaard, Henriksen, Sabroe, & Secher, 1993). While most women in Thailand continue to work throughout their pregnancy, there is no research that has determined the relationship between the experience of job strain and psychological distress during pregnancy. Knowing the causes of psychological distress in

pregnant women can lead to establishing effective interventions to enhance maternal psychological health and improve birth outcomes.

Perceived social support has been shown to have a moderating effect on the negative impact of high job strain (Karasek, Triantis, & Chaudhry, 1982). Perceived social support from supervisors and coworkers (workplace support) or partners, family members, and close friends (family support) can mitigate the impact of job strain on psychological distress (Norbeck, 1985). Individual coping strategies, or cognitive and behavioral adjustments made to deal with a stressful event (Lazarus & Folkman, 1984), may further attenuate the negative health effects of job strain. Although several studies have examined the relationship between job strain and psychological distress among particular occupations with stressful work environments (e.g. nurses, teachers, and factory workers) (Bourbonnais, Comeau, Vezina, & Dion, 1998; Lin, Probst, & Hsu, 2010; Santavirta & Solovieva, 2007; Sein, Howteerakul, Suwannapong, & Jirachawee, 2010), there are no published studies explaining the relationship between job strain and psychological distress or the moderating effects of social support and coping strategies among employed, pregnant Thai women. Understanding the mechanism by which job strain, social support, and coping strategies affect psychological health in employed pregnant Thai women would provide valuable information that could be used to develop interventions to reduce or prevent psychological distress within this population.

In 2011, 65 out of 77 provinces in Thailand were declared a disaster zone. The flood was described as the worst flooding in Thailand in terms of the amount of water and the number of people affected (Department of Disaster Prevention and Mitigation, 2012). A number of pregnant women were evacuated out of the flooding area (displaced women), while some women were not directly affected by the flood (non-displaced women). Displacement depended upon the severity

of the flooding in the women's residence. Given that pregnancy is a major life change and a source of enormous stress in a woman's life (Xiong et al., 2008), pregnant women are particularly vulnerable to the effects of the additional stress encountered during a disaster (Buekens, Xiong, & Harville, 2006; Xiong et al., 2010). Previous studies have shown that pregnant women that have experienced disasters are at high risk for antenatal depression and adverse birth outcomes (e.g. preterm birth, low birth weight) (Harville, Xiong, & Buekens, 2010; Xiong et al., 2010). The 2011 flood provided a unique opportunity to examine the effect of the flood on birth outcomes.

## **B. Purposes of the Study**

The specific aims of the first study, which focuses on the effect of job strain on psychological distress, were to determine: (1) the relationships among job strain, perceived workplace support and family support, coping strategies, and psychological distress while controlling for pre-existing factors, and (2) the potential moderating effects of perceived workplace support, perceived family support, and coping strategies on the relationship between job strain and psychological distress.

The specific aims of the second study, which emphasized the effect of the 2011 flood on birth outcomes, were to: (1) compare the prevalence of antenatal depressive symptoms between the displaced and non-displaced women, (2) examine the impact of displacement on birth outcomes (infant birth weight and gestational age at birth), and (3) examine the moderating effect of perceived social support on the relationship between displacement and birth outcomes.

### **C. Significance of the Study**

To the best of my knowledge, this would be the first study that attempted to understand the roles of perceived social support and coping strategies on the relationship between job strain and psychological distress among employed pregnant Thai women. The results of this study provided preliminary data to determine the effect of job strain and to explain the mechanism by which job strain affects psychological distress in employed pregnant Thai women. Effective interventions to reduce the level of psychological distress in pregnant women can be developed based on the findings of this study.

The second study describes the impact of the 2011 flood in Thailand on antenatal depressive symptoms and birth outcomes and illustrates the role of perceived social support on the relationship between displacement and birth outcomes. The findings of this study can be used to develop a guideline to prepare pregnant women in dealing with disasters in the future and to establish an intervention to moderate the impact of disasters on birth outcomes.

## **II. JOB STRAIN AND PSYCHOLOGICAL DISTRESS AMONG EMPLOYED PREGNANT THAI WOMEN: THE ROLE OF SOCIAL SUPPORT AND COPING STRATEGIES**

### **A. Introduction**

One out of five Thai women suffers from psychological distress during pregnancy (Limlomwongse & Liabsuetrakul, 2006). Psychological distress during pregnancy is known to impact both the woman's and her infant's health. Pregnant women with psychological distress have more pregnancy-related symptoms, higher needs for pain relief during labor, higher rates of cesarean sections, and increased risk of preterm delivery, low infant birthweight, and postpartum depression (Andersson, Sundström-Poromaa, Wulff, Åström, & Bixo, 2004; Field et al., 2004; Hedegaard, Henriksen, Sabroe, & Secher, 1993; Saunders, Lobel, Veloso, & Meyer, 2006). Infants of depressed mothers have high levels of cortisol that mimic the cortisol levels shown in their mothers' prenatal profiles. Prolonged exposure to high levels of cortisol increases the risk of a difficult infant temperament (e.g., crying, fussing, and negative facial expressions) (Field, Diego, & Hernandez-Reif, 2006).

Psychological distress is preceded by specific stressful events (e.g., working environment) that repeatedly occur and accumulate to become chronic stressors (Alder, Fink, Bitzer, Hösli, & Holzgreve, 2007). Job strain, the joint effects of high psychological job demand and low control over the conditions of work, has been identified as an important cause of psychological distress among women in many industrialized countries (Bourbonnais, Comeau, Vezina, & Dion, 1998; Virtanen et al., 2007). In Thailand, where almost 76% of women of reproductive age (15 – 44 years) participate in the labor force (e.g., service workers, agricultural

production, commercial manufacturing) (National Statistical Office, 2009), job strain may be an unexplored but significant contributor to psychological distress among pregnant women.

Approximately 28% of Thai workers have experienced high job strain, including women in their reproductive years (Sein, Howteerakul, Suwannapong, & Jirachawee, 2010). A number of studies have examined the relationship between job strain and psychological distress among nurses, teachers, and civil servants. The association between job strain and psychological distress is a consistent finding that has been replicated across studies using different designs, measures, and populations (Bourbonnais, Brisson, Moisan, & Vézina, 1996; Bourbonnais, Comeau, Vezina, & Dion, 1998; Bültmann, Kant, Schröer, & Kasl, 2002; H. S. Lin, Probst, & Hsu, 2010; Lopes, Araya, Werneck, Chor, & Faerstein, 2010; Santavirta & Solovieva, 2007; Van der Doef & Maes, 1999; M. E. I. S. Yang, Pan, & Yang, 2004). Studies of job strain in pregnant women have focused mainly on adverse birth outcomes such as preterm birth, low birth weight, and being small for gestational-age infants. However, these studies have yielded conflicting results. Some studies found that high job strain in employed pregnant women was associated with adverse birth outcomes (Brett, Strogatz, & Savitz, 1997; D. Chen et al., 2000; Oths, Dunn, & Palmer, 2001; Tuntiseranee, Geater, Chongsuvivatwong, & Kor-anantakul, 1998; Vrijkotte, van der Wal, van Eijnden, & Bonsel, 2009), while several other studies concluded that there was no association between job strain and adverse birth outcomes (Brandt & Nielsen, 1992; Ceron-Mireles, Harlow, & Sanchez-Carrillo, 1996; Escribà-Agüir, Perez-Hoyos, & Saurel-Cubizolles, 2001; Niedhammer et al., 2009). The differences in outcomes across studies of job strain and birth outcomes may be due to differences in study populations, measurement instruments, or other study-related factors. In addition, these studies did not consistently measure other variables



that could influence the relationship between job strain and adverse birth outcomes, such as psychological distress, social support, or coping strategies.

Many studies on the relationships among social support, coping strategies, and stress have been guided by the transactional model of Lazarus and Folkman (1984) (LeSergent & Haney, 2005; H. S. Lin, Probst, & Hsu, 2010; Peñacoba-Puente, Carmona-Monge, Marín-Morales, & Naber, 2012). In this model, social support and coping strategies may buffer or moderate the effect of stress (e.g., job strain) on psychological distress. For example, in the workplace, job strain often cannot be reduced or eliminated (House, 1981; Mor-Barak, 1988), but social support from supervisors and coworkers (workplace support) can reduce feelings of threat, workload, role conflict, and responsibility, thereby leading to less psychological distress (Terry, Nielsen, & Perchard, 1993). Workers with high levels of job strain and low levels of workplace support are at the highest risk for the development of psychological distress, depersonalization, job dissatisfaction, and sickness absences (Abualrub, Omari, & Abu Al Rub, 2009; Choi et al., 2011; Karasek, Triantis, & Chaudhry, 1982; Landsbergis, Schnall, Deitz, Friedman, & Pickering, 1992). In addition to workplace support, social support from partners, family members, and close friends (family support) also decreases the effects of job strain on psychological distress (Munro, Rodwell, & Harding, 1998; Norbeck, 1985).

Coping strategies are used after an individual has appraised the situation as threatening to his/her well-being (Lazarus & Folkman, 1984). The selection of types of coping depends on how the situation is appraised (Folkman & Moskowitz, 2004; Hamilton & Lobel, 2008; Zakowski, Hall, Klein, & Baum, 2001). For example, in the United States and New Zealand, problem-focused coping moderated the effects of job strain on individual psychological distress, while emotion-focused coping moderated these effects for participants in Spain and Japan (Bhagat et

al., 2010). In Germany and South Africa, neither problem-focused nor emotion-focused coping showed moderating effects (Bhaget et al., 2010). One possible explanation for these discrepant findings is that coping strategies are influenced by the cultural context.

Among Thai women, there have been no published studies explaining the relationship between job strain and psychological distress, or the moderating effects of perceived social support and coping strategies on that relationship. Given that most Thai women continue to work throughout their pregnancy, understanding the relationships among these variables has important implications for developing interventions to reduce psychological distress and its consequences. Guided by the transactional model (see Figure 1), the specific aims of the present study were to determine the direct effects of job strain, perceived workplace support and family support, and coping strategies on psychological distress; and the moderating effects of perceived workplace support, perceived family support, and coping strategies on the relationship between job strain and psychological distress.

## **B. Methods**

The study procedures, instruments, and all materials were reviewed and approved by the Institutional Review Board (IRB) of the University of Illinois at Chicago and the three research sites in Thailand. In this cross-sectional study, eligible participants: were at least 18 years of age; were employed in paid, full-time work for at least 6 months during pregnancy; were between 26-38 weeks of gestation at the time of data collection; had no history of mental illness; and had a singleton intrauterine pregnancy. Three hundred pregnant women were recruited from antenatal clinics at one community hospital and two university-affiliated hospitals in Thailand. These hospitals were located in the municipality, surrounded by factories and department stores.

## **1. Procedures**

Pregnant women that met the inclusion criteria were invited to participate in the study and were referred to the study by their healthcare providers. The principal investigator (PI) explained the details of the study to potential participants and obtained written informed consent. The PI and all participants were fluent in the Thai language. Over the course of 20-40 minutes, each participant completed a self-administered questionnaire in paper-pencil format in a private room at the hospital. After each participant returned the questionnaire and before she was discharged, the PI calculated the depression scores based on the Center for Epidemiological Studies-Depression Scale (CES-D). Forty-one percent of the participants reported depressive symptoms ( $CES-D \geq 19$ , the Thai standard cut-off point) and were referred to their healthcare providers for further evaluation and treatment as needed.

## **2. Measures**

All of the measures used in this study were reliable and valid Thai-translated versions that have been used widely with the Thai population (Boonpongmanee, Zauszniewski, & Morris, 2003; Phakthongsuk, 2009; Roykulcharoen, 2003; Rungruangsiripan, Sitthimongkol, Maneesriwongul, Talley, & Vorapongsathorn, 2011; Sawang et al., 2010; N. Wongpakaran & Wongpakaran, 2010).

### **a. Outcome Variable**

Psychological distress included both anxiety and depressive symptoms. A summary score from the State-Anxiety (Form Y-1) was used to indicate the feelings of apprehension, tension, nervousness, and worry among pregnant women (Roykulcharoen, 2003; Spielberger, Gorsuch, & Lushene, 1983). The scale contained 20 items measured on a four-point

Likert scale (1 = not at all, 4 = very much so). The CES-D was used to measure the current level of depressive symptomatology among the pregnant women (Boonpongmanee, Zauszniewski, & Morris, 2003; Radloff, 1977). This scale contained 20 items rated on a four-point Likert scale (0 = rarely or none of the time, 3 = most of the time). The internal consistency reliability of the State-Anxiety, and the CES-D for this study, was .90 and .87, respectively. A combination of the average score of anxiety and depressive symptoms scores was computed to create the psychological distress variable.

#### **b. Predictor and Moderators**

Job strain was the main predictor variable for this study. Perceived workplace support, perceived family support, and coping strategies were moderators.

***Job strain:*** Two subscales of the Thai Job Content Questionnaire (JCQ), psychological demand and job control, were used to assess the levels of job strain among pregnant women (Phakthongsuk, 2009). Pregnant women with high psychological demand and low job control were considered as having high levels of job strain. The psychological demand subscale had 12 items measured on a four-point Likert scale (1 = strongly disagree, 4 = strongly agree) that assessed workload, time pressure, and interpersonal conflict. The internal consistency reliability for this subscale was .79. The job control subscale had 11 items measured on a four-point Likert scale (1 = strongly disagree, 4 = strongly agree) that assessed skill discretion and decision authority in employed pregnant women. The internal consistency reliability for this subscale was .86. A subtraction formula was used to create the job strain variable [(0.5) demands - (0.5) control] (Landsbergis, Schnall, Warren, Pickering, & Schwartz, 1994).

***Perceived workplace support:*** The social support subscale of the Thai JCQ was used to measure perceived workplace support. This subscale had 8 items measured on a four-point Likert scale (1 = strongly disagree, 4 = strongly agree) that assessed the levels of support provided by supervisors and co-workers. The internal consistency reliability for this subscale was .84.

***Perceived family support:*** The Thai version of the Medical Outcomes Study-Social Support Survey (MOS-SSS) was used to capture perceptions of the available and adequate support provided by significant others (Rungruangsiripan, Sitthimongkol, Maneesriwongul, Talley, & Vorapongsathorn, 2011). This scale has one item that assessed the number of supporters and 15 items that assessed the four dimensions of support (emotional/informational, tangible, positive social interaction, and affectionate). The 15 items were measured on a five-point Likert scale (1 = none of the time, 5 = all the time). The internal consistency reliability of the MOS-SSS for this study was .94.

***Coping strategies:*** the Ways of Coping Checklist-Revised (WCCL-R) was used to assess the types of coping strategies that pregnant women used to deal with stress in the work environment (Sawang et al., 2010; Vitaliano, Russo, Carr, Maiuro, & Becker, 1985). This scale had 42 items measured on a four-point Likert scale (0 = never used, 3 = regularly use). The WCCL-R consists of five subscales—problem focused coping, seeking social support, blaming self, wishful thinking, and avoidance. In this study, the internal consistency reliability for each subscale was .89 for problem-focus coping; .84 for seeking social support; .80 for blaming self; .84 for wishful thinking; and .73 for avoidance. The relative scores of each type of coping strategy were calculated and used in the analyses (Vitaliano, Maiuro, Russo, & Becker, 1987).

### c. **Pre-existing Factors**

In order to examine the impact of job strain on psychological distress, factors that known to be related to psychological distress in pregnant women were measured and controlled in the analyses. The questionnaires included: socio-demographic data—age, educational, income; pregnancy status—gestational age, pregnancy intent, parity; and employment status—job title, workplace, and number of years of work experience. The Perceived Stress Scale (PSS) was used to assess the levels of stress in a pregnant woman's life (Cohen & Williamson, 1988; N. Wongpakaran & Wongpakaran, 2010). The scale had 10 items on a five-point Likert scale (0 = never, 4 = very much). The internal consistency reliability of the PSS for this study was .74. Since the data were collected in 2011 soon after the significant flood in Bangkok and surrounding areas, one of the research sites was affected by the flood. Participants were queried concerning the impact of the flood (e.g., have you been displaced, have you lost your job and for how long during the flood?).

### 3. **Data Analysis**

The statistical package SPSS version 20 was used for the analyses. Multiple linear regression analyses were performed to determine the effects of job strain, perceived workplace support, perceived family support, and coping strategies on psychological distress. No significant violations of the assumptions of linear regression were detected. Based on Pearson correlations, some types of coping strategies were moderately to highly correlated ( $r = .30 - .60$ ). To avoid problems with multicollinearity, separate multiple linear regressions were run for each coping strategy. In the multiple linear regressions, all predictor and control variables were entered together in the model. Hierarchical multiple linear regression analyses were performed to

determine the moderating effects of perceived workplace support, perceived family support, and coping strategies on the relationship between job strain and psychological distress. All continuous variables used in the interaction terms were centered before creating the interaction terms (Keith, 2006). In the first step, only the significant variables from the simultaneous regression model were entered into the model. In the second step, each interaction term was entered separately (e.g., job strain x perceived workplace support, job strain x perceived family support, and job strain x problem-focused coping).

For the models with significant interaction terms, simple slopes were computed and tested for statistical significance (Regression, 2011). With simple slopes, the moderating variable was held constant at different combinations of values—from very low to very high, while the psychological distress variable was regressed on the job strain variable. Other variables in the model were held constant at their means. Finally, the significant simple slopes were graphed for each value of the moderating variable.

## **C. Results**

### **1. Description of the Study Sample**

As shown in Table I, the mean age of the participants was 29. Forty percent completed education beyond high school, and 40% had a monthly income between \$333 to \$666 U.S. dollars. More than half of the participants had unplanned pregnancies and more than half were multigravidas. Gestational age ranged from 26 – 37 weeks, with a mean of 31 weeks. About 60% of the participants had been working as semi-skilled workers (e.g., service workers, factory workers, and laborers) and 40% were skilled workers (e.g., managers, technician/professional, and accountants). The scores for the outcome and predictor variables are

shown in Table II. Job strain scores ranged from -12.05 to 10.60. Participants tended to use problem-focused coping rather than emotion-focused coping.

## 2. **Bivariate Relationships**

Job strain and three coping strategies—blaming self, wishful thinking, and avoidance—were significantly and positively correlated with psychological distress. In contrast, perceived workplace support, perceived family support, problem-focused coping, and seeking social support were significantly and negatively correlated with psychological distress. The pre-existing factor, life stress, had a strong correlation with psychological distress. There were also small negative correlations between maternal age and psychological distress and years of working and psychological distress (see Table III).

## 3. **The Impact of Job Strain, Perceived Workplace Support, Perceived Family Support, and Coping Strategies on Psychological Distress while Controlling for Pre-existing Factors**

None of the pre-existing factors, except for life stress, significantly explained the variance in psychological distress when other main variables were controlled for. Therefore, these variables were later excluded from the analyses. In the best-fitting regression model, life stress, job strain, perceived workplace support, perceived family support, and seeking social support as a coping strategy explained 54% of the variance in psychological distress. Of the four significant predictors, life stress and job strain increased psychological distress, whereas perceived family support and seeking social support as a coping strategy decreased psychological distress (see Table IV).



**4. Moderating Effects of Perceived Workplace Support, Perceived Family Support, and Coping Strategies on the Relationship between Job Strain and Psychological Distress**

The results from the hierarchical multiple linear regression models indicated that the interaction terms between job strain and perceived workplace support, and job strain and perceived family support, were not significant. In separate regression models, two types of coping strategies, seeking social support and wishful thinking, moderated the effects of job strain on psychological distress. As illustrated in Table V, the interaction term between job strain and seeking social support (job strain x seeking social support) was statistically significant, meaning that the relationship between job strain and psychological distress depends on levels of seeking social support. Table V, in addition, shows that a significant moderating effect was found between job strain and wishful thinking. The interaction term explained 0.8% in addition to the variance already explained by the main effects.

**5. Simple Slopes Analyses**

The simple slopes analyses of job strain on psychological distress when seeking social support and wishful thinking were held at different values and are shown in Table 6 and Figures 2 and 3. The results show that the simple slopes for the moderating effect of seeking social support on the relationship between job strain and psychological distress were statistically significant for levels of seeking social support at the mean and above the mean, but not at levels below the mean (see Table VI). Figure 2 shows the moderating effect of seeking social support on the relationship between job strain and psychological distress. Among women with job strain scores at or above the mean, the negative impact of job strain on psychological distress was less

pronounced, with scores on seeking social support at the mean. For seeking social support scores at one and two standard deviations above the mean, the negative impact of job strain on psychological distress was much stronger.

The moderating effects of wishful thinking were statistically significant for the levels of wishful thinking at the mean and below the mean, but not at levels above the mean (see Table VI). As shown in Figure 3, unlike seeking social support, the adverse effect of job strain on psychological distress was strongest when wishful thinking scores were two standard deviations below the mean.

#### **D. Discussion**

To the present author's knowledge this is the first study of job strain and psychological distress among employed pregnant women in Thailand. As expected, job strain had a significant effect on psychological distress. Moreover, the strength of this effect depended on the amounts of two types of coping strategies—seeking social support and wishful thinking. Although perceived family support and perceived workplace support did not moderate the relationship between job strain and psychological distress, these two types of social support did have significant direct effects on reducing psychological distress in employed pregnant women.

Consistent with previous studies among other types of workers and in other countries, job strain was a substantial contributor to psychological distress (Bourbonnais, Brisson, Moisan, & Vézina, 1996; Bourbonnais, Comeau, Vezina, & Dion, 1998; Cropley, Steptoe, & Joeke, 1999; H. S. Lin, Probst, & Hsu, 2010). According to the transactional model, work demands that exceed an employee's resources to manage are considered as environmental antecedent variables

that relate to psychological distress, and in this study, this relationship has now been extended to employed pregnant women in Thailand (Lazarus & Folkman, 1984).

As a potential intervention to reduce the effects of job strain on psychological distress, perhaps the most important findings in this study are the moderating effects of two types of coping strategies (i.e. seeking social support and wishful thinking) on the job strain-psychological distress relationship. Seeking social support was used when pregnant women appraise the situation as changeable and they try to solve the problem through social contacts (Vitaliano, Russo, Carr, Maiuro, & Becker, 1985). Among pregnant women with levels of job strain above the mean, the negative impact of job strain on psychological distress was most pronounced when pregnant women strongly sought social support. However, average levels of seeking social support mitigated the effects of job strain on psychological distress among pregnant women. Wishful thinking was used when pregnant women appraise the situation as unchangeable and try to regulate their internal emotions. Similar to the moderating effect of seeking social support, among pregnant women with levels of job strain above the mean, average levels of wishful thinking mitigated the effects of job strain on psychological distress. However, unlike the moderating effect of seeking social support, the negative impact of job strain on psychological distress was most pronounced with below average levels of wishful thinking. Changing one's perspective of the problem might be easier than solving the problem (Bhagat, Allie, & Ford, 1991). Pearlin and Schooler (1978) found that emotion-focused coping was a beneficial coping style for dealing with stress related to work (Pearlin & Schooler, 1978). The present study has contributed to the literature in that it was found that different types of coping strategies are related to one's health in different directions (Hamilton & Lobel, 2008; Zakowski, Hall, Klein, & Baum, 2001).

Another contribution of the findings was the significant direct effect of perceived workplace and family support in reducing psychological distress in employed pregnant women. The perception of the availability of support when it is needed provided positive results and a sense of stability in one's life situation, as suggested by Cohen and Wills (1985). Perceived family support had a more substantial effect than did perceived workplace support. Trusting social relationships with the family may be stronger than other types of social relationship (Karasek, Triantis, & Chaudhry, 1982). These findings suggest that interventions may be better directed toward family support than workplace support.

#### **E. Limitations**

This study is limited by the use of subjective measures of stress. Although the instruments used demonstrated high reliability and validity, future studies would be enhanced by using biological measures of stress. The design of the study was cross-sectional; therefore changes or processes of coping strategies could not be examined over time. Social support was considered as a coping resource and may have had an influence on the selection of the type of coping strategies. However, this study did not examine these relationships. Finally, the findings may not be able to be generalized to other employed pregnant women in other regions of Thailand that have different types of jobs from the participants in this study.

#### **F. Conclusion**

The study findings suggest that the prevalence of psychological distress is relatively high among employed pregnant Thai women. Assessing maternal psychological well-being should be integrated as part of standard prenatal care for them. Job strain is a significant predictor of psychological distress regardless of the levels of social support. Future studies should focus on

designing and testing family and workplace social support interventions to reduce psychological distress among employed pregnant women. Two types of coping strategies—wishful thinking and seeking social support—had moderating effects on the negative impact of job strain on psychological distress. With both types of coping, average levels were most beneficial. Women with very high levels of seeking social support and very low levels of wishful thinking were at highest risk for experiencing job strain-related psychological distress. Interventions should be targeted to these two at-risk groups.

**TABLE I**  
**PARTICIPANTS' CHARACTERISTICS (N = 300)**

Characteristics	n	%	M	SD	Range
Research site					
Thammasat University Hospital	210	70			
Bang Phli Hospital	79	26.3			
Queen Savang Vadhana Hospital	11	3.7			
Age (yr)			28.76	5.22	19 - 43
Education					
Less than high school	95	31.7			
High school	84	28			
Higher than high school	121	40.3			
Income per month (US Dollar)					
Less than \$333	59	19.7			
\$333 – 666	122	40.7			
\$667-1,000	67	22.3			
More than \$1,000	52	17.3			
Marital status					
Single/ separated	20	6.7			
Married	280	93.3			
Gestational age at data collected			30.77	3.89	26 - 37
Pregnancy Intent					
Planned	141	47			
Unplanned	159	53			
Parity					
Primigravidarum	125	41.7			
Multigravidarum	175	58.3			
Working experience (year)			4.34	3.95	1 - 20
Job title					
Skilled workers	119	39.6			
Semi-skilled workers	181	60.4			
Workplace					
Private	244	81.3			
Government	56	18.7			
Lost job during the flood (month)			1	1.05	0 - 4
Displaced during the flood					
Yes	154	51.3			
No	146	48.7			

**TABLE II**

DESCRIPTIVE STATISTICS: PSYCHOLOGICAL DISTRESS, JOB STRAIN, AND COPING STRATEGIES (N = 296)

Variables	M	SD	Range
Psychological distress	19.4	7.6	4.5 – 45.5
Job strain	-2.5	3.6	-12.1 – 10.6
Problem-focus coping	25	5.5	11 – 53.6
Seeking social support	28	7.3	7 – 52.5
Blamed self	14	6.9	0 – 39.6
Wishful thinking	18	5.2	0 – 34.1
Avoidance	15	4.5	3.9 – 36.8

**TABLE III**

BIVARIATE CORRELATION AMONG CONTINUOUS VARIABLES (N = 296)

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Psycho distress	--												
2. Age	-.15**	--											
3. GA	.06	.08	--										
4. Years of working	-.19**	.55**	.07	--									
5. Life stress	.66**	-.14*	-.02	-.13*	--								
6. Job strain	.37**	-.08	.04	-.11	.37**	--							
7. Family support	-.51**	.01	-.01	.05	-.41**	-.33**	--						
8. Work support	-.23**	-.17**	-.05	-.07	-.15*	-.36**	.30**	--					
9. Problem-focused	-.37**	.17**	.03	.19*	-.33**	-.23**	.26**	.06	--				
10. Seeking support	-.41**	-.03	.04	.04	-.30**	-.18**	.42**	.20**	.13*	--			
11. Blame-self	.35**	-.02	-.08	-.10	.27**	.15*	-.35**	-.16**	-.56**	-.52**	--		
12. Wishful thinking	.24**	.02	-.02	.04	.16**	.11	-.10	-.04	-.29**	-.47**	.01	--	
13. Avoidance	.30**	-.15**	.03	-.20**	.29**	.21**	-.34**	-.10	-.23**	-.42**	-.00	-.04	--

\*\*. Correlation is significant at the 0.01 level (2-tailed).

\*. Correlation is significant at the 0.05 level (2-tailed).



**TABLE IV**

ESTIMATED COEFFICIENTS OF REGRESSION ANALYSIS FOR VARIABLES  
PREDICTING PSYCHOLOGICAL DISTRESS WITHOUT INTERACTION EFFECTS  
(N = 296)

Variable	B	SEB	$\beta$	<i>p-value</i>	95% CI	
					lower	upper
Life stress	.744	.073	.470	.000	.600	.889
Job strain	.200	.099	.094	.044	.006	.395
Family support	-.155	.034	-.220	.000	-.222	-.088
Work support	-.046	.061	-.034	.455	-.166	.075
Seeking social support	-.150	.047	-.143	.002	-.242	-.057

Note:  $F_{(5, 288)} = 67.75, p < .001, R^2 = .54$

CI: Confidence interval

**TABLE V**

ESTIMATED COEFFICIENTS OF REGRESSION ANALYSIS FOR VARIABLES  
PREDICTING PSYCHOLOGICAL DISTRESS, INCLUDING INTERACTION EFFECTS  
(N = 296)

Variable	B	SEB	$\beta$	<i>p-value</i>	95% CI	
					lower	upper
<b>Model 1</b>						
Life stress	.752	.071	.475	.000	.612	.893
Family support	-.167	.033	-.237	.000	-.233	-.101
Job strain	.257	.092	.120	.005	.076	.437
Seeking social support	-.165	.046	-.157	.000	-.255	-.074
Job strain X seeking social support	.031	.011	.109	.007	.009	.054
<b>Model 2</b>						
Life stress	.765	.072	.484	.000	.624	.906
Family support	-.197	.032	-.278	.000	-.259	-.134
Job strain	.269	.094	.126	.004	.084	.454
Wishful thinking	.178	.060	.121	.003	.061	.296
Job strain X wishful thinking	-.038	.017	-.089	.030	-.072	-.004

Model 1:  $F_{(5, 288)} = 70.856, p < .001, R^2 = .552$

Model 2:  $F_{(5, 288)} = 68.906, p < .001, R^2 = .545$

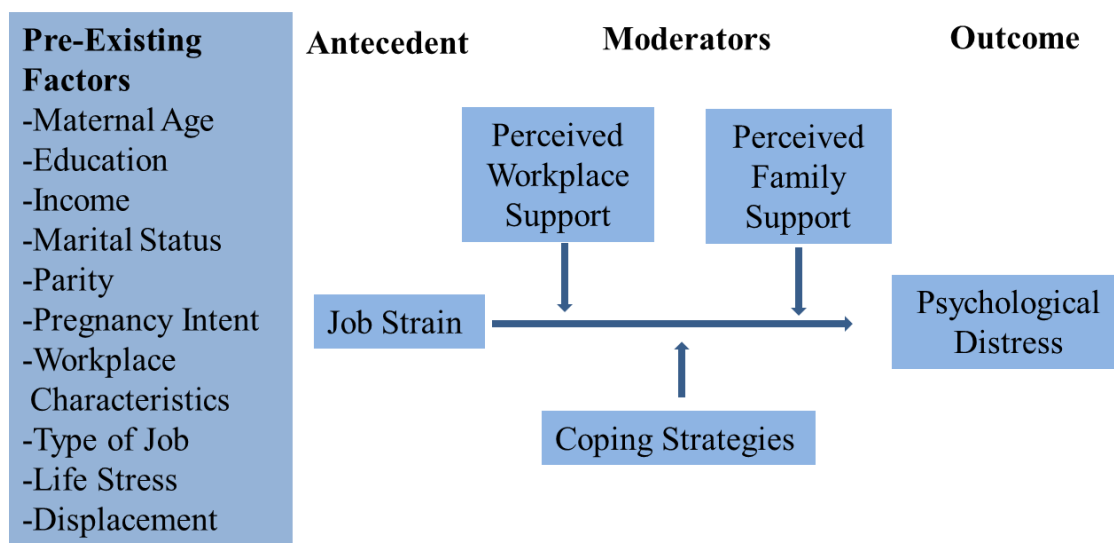
**TABLE VI**

SIMPLE SLOPES OF JOB STRAIN PREDICTING PSYCHOLOGICAL DISTRESS WITH SEEKING SOCIAL SUPPORT (SSS) AND WISHFUL THINKING (WT) HELD CONSTANT AT DIFFERENT VALUES (N = 296)

Values of coping strategies	Marginal effect of job strain on psychological distress	95% CI	p-value
<b>Seeking social support (SSS)</b>			
SSS = 14 (2 SD below mean)	-.17	-.52 - .18	.341
SSS = 21 (1 SD below mean)	.04	-.18 - .28	.686
SSS = 28 (At mean)	.26	.09 - .45	.004
SSS = 35 (1 SD above mean)	.48	.24 - .73	.000
SSS = 42 (2 SD above mean)	.70	.33 - 1.07	.000
<b>Wishful thinking (WT)</b>			
WT = 8 (2 SD below mean)	.66	.24 - 1.08	.002
WT = 13 (1 SD below mean)	.47	.19 - .75	.001
WT = 18 (At mean)	.28	.09 - .47	.003
WT = 23 (1 SD above mean)	.09	-.13 - .31	.425
WT = 28 (2 SD above mean)	-.09	-.45 - .25	.578

Note: The marginal effects are the amount of change in psychological distress with a one unit change in job strain while holding seeking social support or wishful thinking constant at the scores above and below the mean. Life stress and family support were held constant at their means.

Figure 1. Conceptual model



The conceptual model was modified from the Transactional Model (Lazarus & Folkman, 1984). Job strain is an antecedent variable and a possible cause of psychological distress, the outcome variable. Perceived workplace support and perceived family support and coping strategies are moderating variables; the effects of job strain on psychological distress depend on the levels of perceived workplace and family support and the types of coping strategies that are used. Pre-existing factors that may also have an effect on psychological stress in pregnant women are control variables in the analysis.

Figure 2. Moderating effects of seeking social support on the relationship between job strain and psychological distress

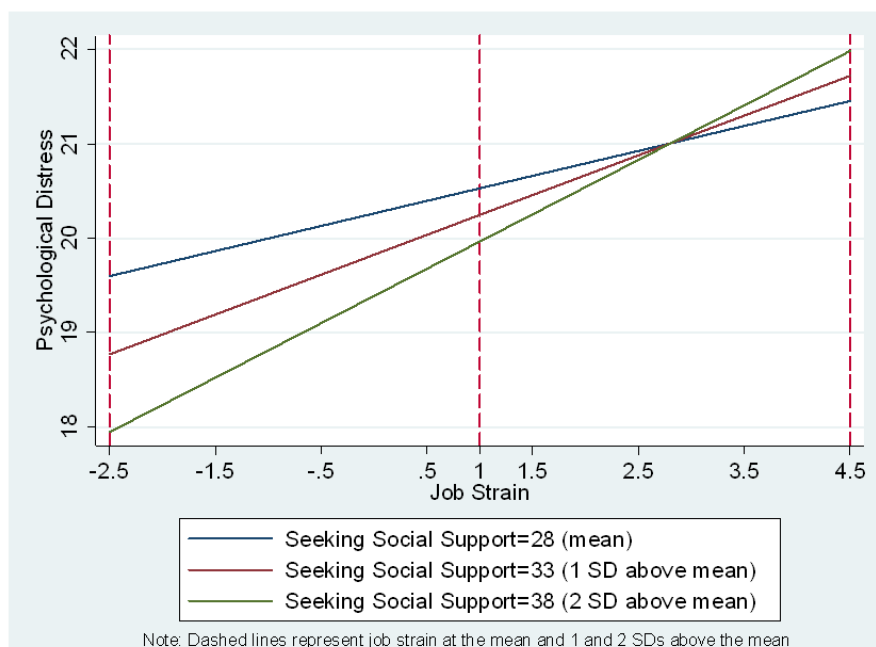
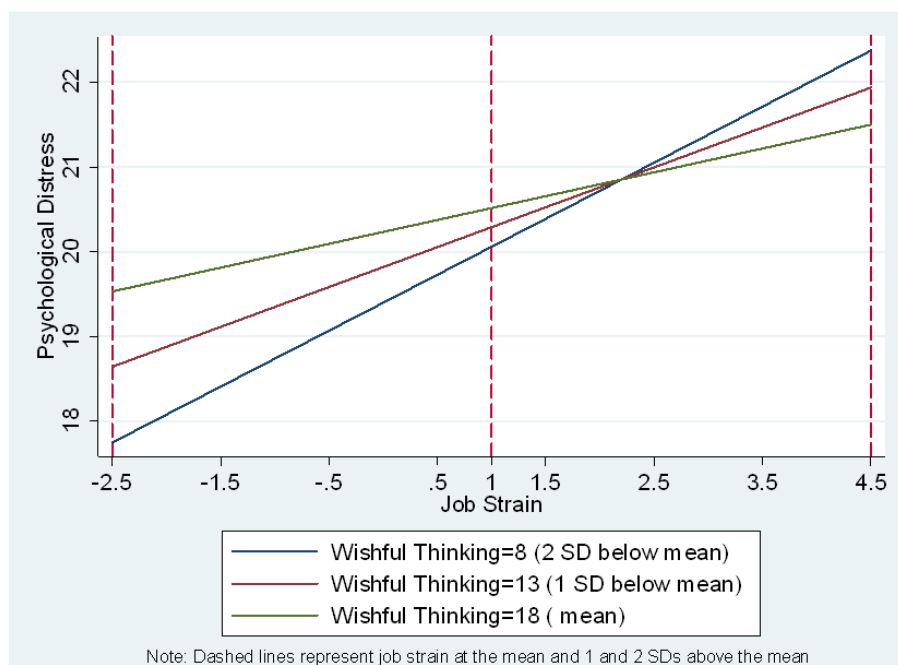


Figure 3. Moderating effects of wishful thinking on the relationship between job strain and psychological distress



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### **III. IMPACT OF THE 2011 FLOOD IN THAILAND ON BIRTH OUTCOMES: THE ROLE OF SOCIAL SUPPORT**

#### **A. Introduction**

Previous studies have shown that pregnant women that have experienced disasters are at high risk for antenatal depression and adverse birth outcomes (e.g., preterm birth, low birth weight) (Harville, Xiong, & Buekens, 2010; Xiong et al., 2010). In 2011, 65 out of 77 provinces in Thailand were declared disaster zones as a result of severe flooding that began on July 25, and persisted in some areas until January 16, 2012. Due to the monsoon season and the landfall of tropical storm Nock-Ten in the North of Vietnam, bordering Thailand in the north, heavy precipitation and flooding spread from the north through the northeast and the central part of Thailand (Department of Disaster Prevention and Mitigation, 2012). The 2011 flood was described as the worst flooding in Thailand in terms of the amount of water and the number of people affected. The flood affected about 12.9 million people and caused 815 deaths. More than five million people were evacuated, and 65 thousand workers became unemployed. The economic impact was high, costing more than US \$45.7 Billion (National Statistical Office, 2012). Given that pregnancy is a major life change and a source of enormous stress in a woman's life (Xiong et al., 2008), pregnant women are particularly vulnerable to the effects of the additional stress encountering a disaster (Buekens, Xiong, & Harville, 2006; Xiong et al., 2010).

Regarding Hurricane Katrina, social support was one of the most significant losses expressed by pregnant women (Badakhsh, Harville, & Banerjee, 2010). Social support is a factor known to contribute to the health and well-being of pregnant women (Feldman, Dunkel-Schetter, Sandman, & Wadhwa, 2000; Hoffman & Hatch, 1996; Oakley, 1988; Orr, 2004). Under a threatening circumstance such as a flood disaster, where stress cannot not be reduced or eliminated, the moderating effect of perceived social support is worth closer investigation.

### **1. Disaster and Antenatal Depressive Symptoms**

Following Hurricane Katrina, the prevalence of antenatal depressive symptoms ranged from 12.7% to 25% (Savage et al., 2010; Xiong et al., 2010), which was about two times higher than pregnant women in general (Bennett, Einarson, Taddio, Koren, & Einarson, 2004). Hurricane Katrina affected women's lives in many aspects, for example, losing their homes and all belongings, dealing with job instability, and altering their plans (Savage et al., 2010). The risk of elevated depressive symptoms was also seen to be positively associated with the increasing number of severe hurricane-related events (Xiong et al., 2010). The negative impact of a disaster affects not only the psychological health of pregnant women but also their birth outcomes.

### **2. Disaster and Birth Outcomes**

The impact of disasters on birth outcomes has been studied across different types of disasters yielding similar findings (Harville, Xiong, & Buekens, 2010). For example, the rate of spontaneous abortion in Western New York in 1973 was significantly higher compared to the other years before and after the flood (Janerich et al., 1981). Neuberg, et al. (1998) reported a high incidence rate of pregnancy losses among Polish women that were injured from the flood in southern Poland in 1997 (Neuberg, Pawlosek, Lopuszanski, & Neuberg, 1998). The incidence of

low birth weight and preterm birth significantly increased following the catastrophic flood in North Dakota (Tong, Zotti, & Hsia, 2011). Following the earthquake in Taiwan, the prevalence of low birth weight significantly increased (H. L. Chang, Chang, Lin, & Kuo, 2002). It is widely recognized that the impact of a disaster on birth outcomes is determined by the severity of exposure. The pregnant women that experienced severe events of Hurricane Katrina (e.g., walking through floodwaters, significant home damage, or feeling that one's life was in danger) were more likely to have low birth weight infants compared to women with non-extensive experience (Xiong et al., 2008). One possible explanation is that the individual and community resources contributing to healthy pregnancy were disrupted during the disaster, including social support (Badakhsh, Harville, & Banerjee, 2010; Xiong et al., 2008), resulting in adverse birth outcomes.

### **3. Perceived Social Support and Birth Outcomes**

Perceived social support, availability of support when it is needed, has been shown to have a beneficial effect on birth outcomes (Collins, Dunkel-Schetter, Lobel, & Scrimshaw, 1993; Feldman, Dunkel-Schetter, Sandman, & Wadhwa, 2000; Norbeck, 1985; Pagel, Smilkstein, Regen, & Montano, 1990; Turner, Grindstaff, & Phillips, 1990). Oakley (1988) indicated that social support is relevant to birth outcomes because it has the potential effect of reducing stress. The mechanism by which social support is associated with health can be explained in terms of a direct and a moderating effect (Cohen & Wills, 1985). Several observational studies have illustrated the direct effect of social support on birth outcomes; a higher level of social support was associated with improved birth outcomes (Orr, 2004). Although the moderating effects of social support are an appealing mechanism and provide a strategy for alleviating the impact of stress, the evidence illustrating its moderating

effect on birth outcomes is limited. The 2011 flood in Thailand provides a unique opportunity to examine the role of perceived social support.

During the 2011 flood in Thailand, a number of women were evacuated out of the flooding area (displaced women), while some women were not directly affected by the flood (non-displaced women). Displacement depended upon the severity of the flooding in the women's residence. It was hypothesized that the negative consequences of the flood on psychological health and birth outcomes might even have been worse among the displaced women, particularly those with low levels of perceived social support. The purposes of this study were to compare the prevalence of antenatal depressive symptoms between the displaced and non-displaced women; to examine the impact of displacement on birth outcomes (infant birth weight and gestational age at birth); and to examine the moderating effect of perceived social support on the relationship between displacement and birth outcomes.

## **B. Methods**

This is a descriptive, longitudinal study. The setting was a university-affiliated hospital in Phatum Thani province, Thailand. Phatum Thani, bordering Bangkok in the north, is one of the major industrial estates in the central part of Thailand. During the flood, many manufacturing companies in this area were inundated; workers were temporarily unemployed. The university-affiliated hospital serves the residences in this province and surrounding area, with an average of 50-80 pregnant women receiving antenatal care at the hospital per day.

### **1. Participants**

The participants were part of a larger research study designed to examine the relationship between job strain and psychological distress among employed pregnant women and

the results were reported in another manuscript. Eligible participants were at least 18 years of age, were employed full-time, were between 26-38 weeks of gestation, had no history of mental illness, and had a singleton intrauterine pregnancy. To estimate the sample size of this study, a similar study was used to determine the effect size. The outcome variable was infant birth weight. According to Costa et al. (2000), a large effect size can be used to calculate the sample size (Costa, Dritsa, Larouche, & Brender, 2000). However, infant gestational age was included in the analysis, which significantly explained about 19% out of 44% of the variance in infant birth weight. Infant gestational age was one of the outcome variables of the current study. Therefore, a medium effect size was used to calculate the sample size. Using the G\*Power program version 3.2.1 with a medium effect size, a sample size of 130 was needed in order to achieve a power of .80 and an alpha of .05 (Erdfelder, Faul, & Buchner, 1996).

## **2. Measures**

Birth outcome data, infant birth weight, and gestational age at birth were collected from the delivery records. Infant birth weight was measured in grams. Gestational age at birth was calculated based on the woman's last menstrual period (L.M.P), or ultrasonography if the LMP was not provided, as number of weeks. Both infant birth weight and gestational age were treated as continuous variables in the analyses. To present the prevalence of low birth weight and preterm birth, dichotomous variables were also created. Low birth weight was defined as infant birth weight less than 2,500 grams. Preterm birth was defined as infants born before 37 weeks.

The Thai translated version of the Center for Epidemiological Studies-Depression Scale (CES-D) was used to screen the current level of antenatal depressive symptoms (Boonpongmanee, Zauszniewski, & Morris, 2003). The CES-D has 20 items on a four-point

Likert scale (0 = rarely or none of the time, 3 = most of the time). The possible scores ranged from zero to 60. The Thai standard cut-off point ( $CES-D \geq 19$ ) was used to identify pregnant women that were at risk of depression (Kuptniratsaikul & Pekuman, 1997). Concurrent validity was supported by the correlation with life events. This scale has been used widely with pregnant Thai women and has demonstrated acceptable reliability. The Cronbach's alpha was .88 in this study, indicating good internal consistency.

The Medical Outcome Study-Social Support Survey (MOS-SSS) was used to measure an individual's perceptions of the availability of support provided and whether the support by partners, family, and close friends was adequate. The Thai version of the MOS-SSS has one item assessing the number of supporters and 15 items assessing the four dimensions of support (emotional/informational, tangible, positive social interaction, and affectionate) (Rungruangsiripan, Sitthimongkol, Maneesriwongul, Talley, & Vorapongsathorn, 2011). The 15 items were on a five-point Likert scale ranging from 1 = none of the time to 5 = all the time. The higher scores indicated the higher perception of available of social support. The Cronbach's alpha was .95 in this study, indicating good internal consistency.

To assess the impact of flooding, participants were asked to answer these two questions: 1) Were you displaced during the flood? and 2) Did you lose your job during the flood, and if yes, for how long? The factors that have been known to be related to birth outcomes were measured and controlled in the analyses. The questionnaires included socio-demographic data—age, educational level, income, job title, workplace; and pregnancy characteristics—gestational age, pregnancy intent, and parity.

### **3. Data Collection**

The study was approved by the Institutional Review Boards of the University of Illinois at Chicago (USA) and of Thammasat University (Thailand), with which the hospital was affiliated. Data were collected soon after the flood, from the beginning of February to the end of April 2012. The pregnant women that met the inclusion criteria were invited to participate in the study by their healthcare providers. The potential participant received a full explanation of the study from the principal investigator. Two parts of the informed consent were: willingness to participate in the study, and allowing the research team to access the delivery records to collect birth outcome data (infant birth weight and gestational age). After informed consent was obtained, the participants completed the self-administered questionnaires in paper-pencil format in the provided room in the hospital. The session lasted for approximately 20 to 40 minutes. One hundred and seventy-five participants out of 210 gave birth at the research site; the Research Assistant later retrieved birth outcome data from the delivery records. Thirty-five participants gave birth outside the research site where birth outcome data were not available.

### **4. Data Analysis**

Statistical package SPSS version 20 was used for the analyses. The differences in outcome variables between displaced and non-displaced women were compared by using independent samples *t*-tests or Chi-test based on the levels of measurement. Multiple linear regression analyses were performed to determine the impact of displacement on infant birth weight and gestational age. Hierarchical multiple linear regression analyses were performed to determine the moderating effect of perceived social support on the relationship between displacement and infant birth weight.



## C. **Results**

### 1. **Description of Participants**

The mean age of the participants was 29 years. More than half of the participants had an unplanned pregnancy, and were multiparous. The mean gestational age at data collection was 30 weeks. Half of the participants had been working as semi-skilled workers (e.g., service workers, factory workers, and laborers) while the others were skilled workers (e.g., managers, professional workers, and accountants). More than 72 percent of the participants were displaced and had temporarily lost their jobs for about 1 month during the flood. Almost 40% reported antenatal depressive symptoms. The mean infant birth weight was 3,094 grams. The average infant gestational age was 38 weeks. The prevalence of preterm birth and low birth weight in this population was about 10 percent (see Table VII).

The findings from the independent *t*-test showed that the mean infant birth weight of the displaced women was significantly lower than that of the non-displaced women. However, the mean scores of perceived social support and infant gestational age were not significantly different. Chi-square tests indicated that the proportion of socio-demographic, obstetric characteristics, antenatal depressive symptoms, preterm birth, and low birth weight among the displaced and non-displaced women were not significantly different (see Table VIII).

### 2. **Significant Factors Explaining the Variance in Infant Birth Weight**

In the linear regression model, parity, job characteristics, displacement, antenatal depressive symptoms, and perceived social support explained 8.1% of the variance in infant birth weight. In addition to displacement, parity and job characteristics had a substantial and

statistically significant effect on infant birth weight. However, antenatal depressive symptoms and perceived social support did not significantly explain the variance in infant birth weight.

The results from the hierarchical multiple linear regression model indicated that the interaction term between displacement and perceived social support was statically significant and explained 2.3% in addition to the variance already explained by the main effects (see Table IX). Figure 4 illustrates the moderating effect of perceived social support on the relationship between displacement and infant birth weight. Among the displaced women, perceived social support had a strong effect on infant birth weight, with higher levels of perceived social support leading to higher infant birth weight. However, perceived social support was unrelated to infant birth weight among the non-displaced women.

#### **D. Discussion**

This study described the impact of the recent flood in Thailand on antenatal depressive symptoms and birth outcomes and illustrated the role of perceived social support on the displacement-infant birth weight relationship. As hypothesized, the infant birth weight of the displaced women was significantly lower than that of the non-displaced women. The lower infant birth weight among displaced women may be related to inadequate nutrient and prenatal care (Badakhsh, Harville, & Banerjee, 2010). During the flood, food shortage was a major problem because more than 7,700 square miles of farmland in Thailand were damaged (Department of Disaster Prevention and Mitigation, 2012). Meanwhile, food and required supplies could not be transported to grocery stores due to the impassible roads for many months. Pregnant women may also have shared the food they had with other family members. Based on the conversations with the participants, some reported that they did not have antenatal care

during the flood due to the difficulty in traveling. Another possible reason was that eating may have become a less important issue for the displaced women while there were other urgent issues that needed to be taken care of, for example, cleaning up after the flood and renovating their houses.

As a potential intervention to reduce the negative impacts of a disaster on birth outcomes, perceived social support had a moderate and significant effect on infant birth weight, particularly among the displaced women. Regarding Cohen & Wills's stress-buffering hypothesis, adequate social support may help pregnant women redefine a stressful situation or eliminate the stress reaction (Cohen & Wills, 1985). Perceived social support may motivate positive healthy behavior in pregnant women and in turn increase infant birth weight (Feldman, Dunkel-Schetter, Sandman, & Wadhwa, 2000).

In this study, it was found that not only displacement but also parity and job characteristics influenced infant birth weight. The infants of the women under these conditions, who were displaced, were primiparous, and had been working as semi-skilled workers, were approximately 500 grams less than the infants of the non-displaced women that were multiparous and had been working as skilled-workers. More specifically, the semi-skilled workers were significantly lower in terms of education and number of supporters compared to the skilled-workers. Lower infant birth weight presents a higher risk of infant mortality, morbidity, developmental problems in childhood and various diseases in adulthood (Wilcox, 2001). A large U.K. cohort study illustrated that infant birth weight was correlated with the cognitive ability of children throughout adulthood; the cognitive scores of the middle birth weight group (3,000 - 3,500 gram) at age 8, 11, 15, and 26 were significantly higher than those of the low birth weight group (2,501- 3,000 gram) and the lowest birth weight group (0 - 2,500 gram). In addition,

infants with higher birth weight were more likely to attain higher education (Richards, Hardy, Kuh, & Wadsworth, 2001).

The prevalence of antenatal depressive symptoms between the displaced and non-displaced women was not significantly different. Similarly, Xiong et al. (2010) found that the rate of depression in New Orleans and Baton Rouge was almost the same even though the women in Baton Rouge were less exposed to Hurricane Katrina. One possible explanation was that pregnant women that were not directly exposed to the disaster might have experienced stress by hearing about the flood through the media (Harville, Xiong, & Buekens, 2009). Surprisingly, antenatal depressive symptoms did not explain the variance in infant birth weight or gestational age in this sample. The findings clearly explain that not all women with elevated depressive symptoms have adverse birth outcomes (Xiong et al., 2008).

#### **E. Limitations**

Several limitations of this study should be considered. All of the participants in this study were employed pregnant women; job-related uncertainty during the flood might have caused the high prevalence of antenatal depressive symptoms. Sixteen percent of the birth outcome data were not able to be accessed. Therefore potential selection bias may have occurred. Antenatal depressive symptoms and perceived social support are subjective measures, and reporting bias cannot be ruled out. The data were collected from one of the university-affiliated hospitals in the central part of Thailand, and therefore the results might not be able to be generalized to other Thai women that experienced the flooding disaster in other regions. Other known factors related to infant birth weight were not measured and were not controlled for in the analyses, such as pre-

pregnancy BMI and maternal weight gain. The exclusion of these factors might potentially have affected the estimation of the flood effect.

## **F. Implications for Practice**

During the flood in Thailand and hurricane Katrina, there was forecast a risk of severe weather and flooding. Especially if pregnant women live in areas of frequent flooding, healthcare providers should include disaster preparedness as a part of their care. Previous studies, particularly those of Ewing, Buchholtz, & Rotanz (2008), have provided useful information for healthcare providers in order to assist pregnant women in dealing with a disaster, for example, preparing drinking water, food and supplies, and planning for a place to evacuate if needed. Pregnant women should retain personal prenatal care records with them, and plan for a place to deliver their babies if their usual hospital is not accessible. Preparation would enhance a sense of control on the part of pregnant women (Badakhsh, Harville, & Banerjee, 2010). In addition to physical needs and childbearing preparation, psychological resources are needed as well (Savage et al., 2010) (see Table X). Screening for psychological distress in pregnant women (e.g., anxiety, depression, and post-traumatic stress disorder) should be implemented as part of antenatal care services, particularly among pregnant women that have experienced a disaster. Enhancing social support from pregnant women's networks would help to protect pregnant women from the negative impacts of a disaster. Policy makers need to make provisions for food relief, especially when a disaster is prolonged or for persons with low resources that may have had few food reserves at home.

## **G. Conclusion**

The results suggest that displaced women that were primiparous and that had been working as semi-skilled workers were at higher risk of having low infant birth weight. The displaced women had lower infant birth weight than the non-displaced women. Perceived social support had a moderating effect on the displacement-infant birth weight relationship. The antenatal depressive symptoms were not significantly related to birth outcomes in this study; however, the long-term effects of depressive symptoms on maternal behavior or child development require further investigation. Healthcare providers then should pay more attention to these groups of pregnant women in terms of maternal weight gain and fetal growth development. Intervention enhancing social support should be targeted to these pregnant women.

**TABLE VII****PARTICIPANTS' CHARACTERISTICS (N = 210) AND BIRTH OUTCOMES (N = 175)**

Characteristics	n	%	M	SD	Range
Age (year)			29.40	5.00	19 – 43
Education					
Less than high school	52	24.8			
High school or higher	158	75.2			
Income per month (US Dollar)					
< \$333	25	11.9			
≥ \$333	185	88.1			
Marital status					
Single/ separated	13	6.2			
Married	197	93.8			
Gestational age when data were collected			30.22	3.77	26 - 37
Pregnancy intent					
Unplanned	116	55.2			
Planned	94	44.8			
Parity					
Primigravidae	86	41			
Multigravidae	124	59			
Job characteristics					
Skilled workers	99	47.1			
Semi-skilled workers	111	52.9			
Workplace					
Private companies	156	74.3			
Government offices	54	25.7			
Lost job during the flood (Month)			1.26	.96	0 - 3
Displaced during the flood					
Were displaced	152	72.4			
Were not displaced	58	27.6			
Depressive symptoms					
CES-D < 19	127	60.5			
CES-D ≥ 19	83	39.5			
Birth outcomes (N=175)					
Infant gestational age (week)			38.16	1.75	33 - 41
Infant birth weight (grams)			3094.86	450.84	1,680 – 4,750
Infant gestational age					
< 37 weeks	18	10.3			
≥ 37 weeks	157	89.7			
Infant birth weight (gram)					
< 2500 gram	18	10.3			
≥ 2500 gram	157	89.7			

TABLE VIII

COMPARISON OF SOCIO-DEMOGRAPHICS, OBSTETRIC CHARACTERISTICS, ANTENATAL DEPRESSIVE SYMPTOMS, SOCIAL SUPPORT, AND BIRTH OUTCOMES AMONG DISPLACED AND NON-DISPLACED WOMEN

	N (%)		$X^2$	$t$	$df$	$p$
	Displaced (n = 152)	Non-displaced (n = 58)				
Education level						
Less than high school	36(23.7)	16(27.6)	.17			
High school or higher	116(73.6)	42(72.4)				
Income (U.S. Dollar)						
< \$333	17(11.2)	8(13.8)	.08			
≥ \$333	135(88.8)	50(86.2)				
Job characteristics						
Skilled-workers	76(50)	23(39.7)	.14			
Semi-skilled workers	76(50)	35(60.3)				
Workplace						
Government offices	39(25.7)	15(25.9)	.00			
Private companies	113(74.3)	43(74.1)				
Parity						
Primigravidae	86(56.6)	38(65.5)	1.04			
Multigravidae	66(43.4)	20(34.5)				
Plan pregnancy						
Unplanned	87(57.2)	29(50)	.62			
Planned	65(42.8)	29(50)				
Depressive symptoms						
CES-D < 19	93(61.2)	34(58.6)	.03			
CES-D ≥ 19	59(38.8)	24(41.4)				
Social support, M (SD)	60.08 (9.74)	58.16 (12.64)		1.05	208	.30
Number of supporters, M (SD)	4.04 (2.22)	4.26 (2.83)		.59	208	.56
	<b>(n = 113)</b>	<b>(n = 52)</b>				
Infant birth weight, M (SD)	3042 (434)	3217 (469)		-2.38	173	.02*
Infant gestational age, M (SD)	38.26 (1.65)	38.60 (1.57)		-1.25	173	.21
Infant gestational age <sup>a</sup>						
< 37 weeks	14(11.4)	4(7.7)	.59			
≥ 37 weeks	109(88.6)	48(92.3)				
Infant birth weight <sup>a</sup>						
< 2,500 gram	15(12.2)	3(5.8)	.28			
≥ 2,500 gram	108(87.8)	49(94.2)				

<sup>a</sup> Fisher's Exact test value was presented

\*  $p < .05$

Note: The average monthly income per household for the whole country of Thailand is approximately \$700 (Source: The household socio-economic survey, whole kingdom, National Statistical Office, Ministry of Information and Communication Technology).



**TABLE IX**

THE IMPACT OF MATERNAL CHARACTERISTICS AND FLOODING ON INFANT BIRTH WEIGHT (N = 175)

Variable	B	SEB	$\beta$	<i>p-value</i>	95% CI	
					lower	upper
Parity	-161.09	68.92	-.176	.021	-297.15	-25.04
Job title	-153.88	70.29	-.171	.030	-292.64	-15.12
Displacement	-194.01	72.50	-.197	.008	-337.14	-50.89
Depressive symptoms	41.69	75.29	.044	.580	-106.94	190.33
Social support	-7.245	5.271	-.171	.171	-17.651	3.161
Displacement X Support	13.409	6.459	.252	.039	.658	26.161

$R^2 = .086$ ;  $F_{(6, 168)} = 2.643$ ,  $p = .018$

$\Delta R^2 = .023$ ,  $F_{(7, 167)} = 2.937$ ,  $p = .006$

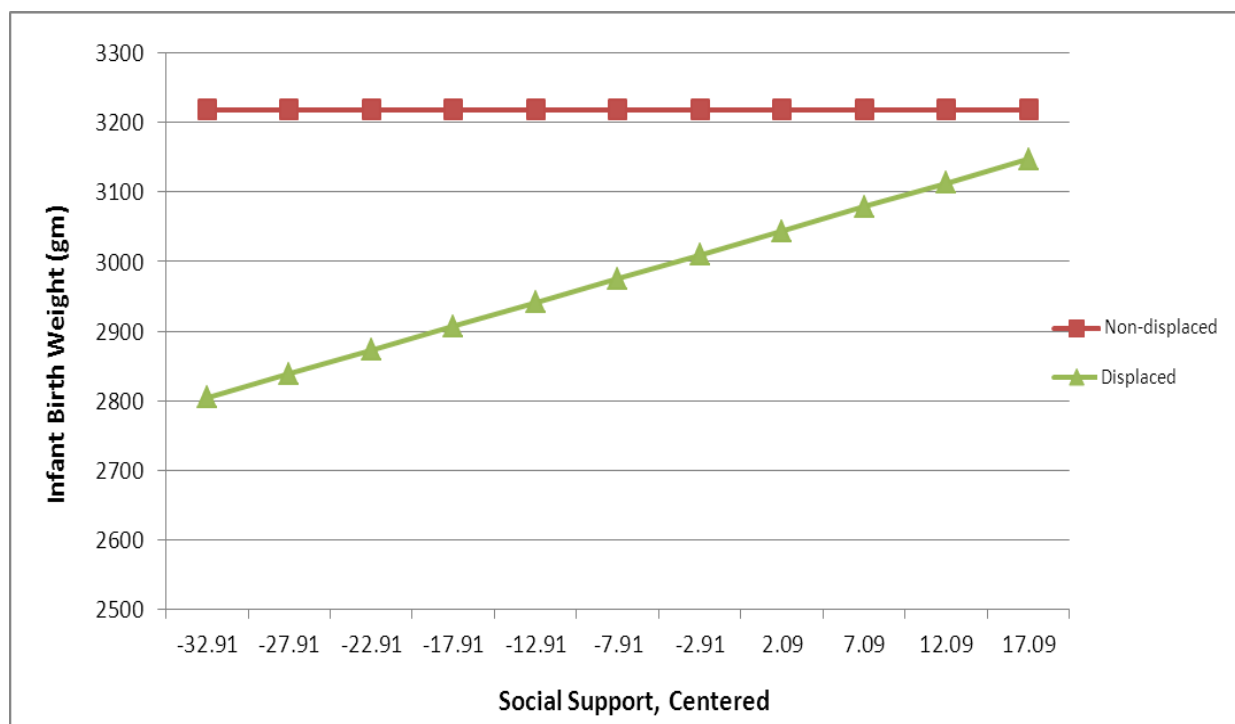
**TABLE X**

GUIDELINES FOR PREGNANT WOMEN IN DEALING WITH A DISASTER

Physical needs	<ul style="list-style-type: none"> <li>▪ Stockpile food, water, prenatal vitamins, and medication</li> </ul>
Prenatal preparedness	<ul style="list-style-type: none"> <li>▪ Retain personal prenatal records</li> <li>▪ Study self-care information (e.g., physiological changes in each trimester, stage of labor, infant care, and breastfeeding)</li> <li>▪ Prepare for birth in an emergency situation</li> </ul>
Family preparedness	<ul style="list-style-type: none"> <li>▪ Plan for the place to stay if evacuation is needed, and plan for the route in travelling</li> <li>▪ Prepare clothes, shoes, and eating utensils in a suitcase</li> <li>▪ Prepare all important documents, for example ID-card, household registration, and bank book</li> <li>▪ Prepare one's own place before leaving (e.g., turn off utilities, check plumbing and safety issues)</li> </ul>
Psychological resources	<ul style="list-style-type: none"> <li>▪ Use effective coping strategies</li> <li>▪ Seek psychological counseling if needed</li> </ul>

Note: Adapted from Ewing, Buchholtz, & Rotanz (2008).

Figure 4. Regression lines illustrating the interaction of displacement condition and social support in their effects on infant birth weight



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## **APPENDICES**

## APPENDIX A

### University of Illinois at Chicago IRB Letters of Approval

#### UNIVERSITY OF ILLINOIS AT CHICAGO

Office for the Protection of Research Subjects (OPRS)  
Office of the Vice Chancellor for Research (MC 672)  
203 Administrative Office Building  
1737 West Polk Street  
Chicago, Illinois 60612-7227

#### Approval Notice Initial Review (Response to Modifications)

September 4, 2011

Natthanaporn Sanguanklin, MS  
Women, Child, & Family Health Science  
845 South Damen  
Room 1116 CON, M/C 802  
Chicago, IL 60612  
Phone: (312) 823-0878 / Fax: (312) 996-8945

**RE: Protocol # 2011-0644**  
**“Job Strain, Social Support, Coping Strategies, and Psychological Distress in**  
**Employed Pregnant Thai Women”**

**Please submit a copy of the IRB approval from Thammasat Hospital for this research, via an Amendment, when obtained. Please note that the IRB approval must be accompanied by an Amendment Form when submitted to the UIC IRB.**

**Please be reminded that translated study recruitment and consent documents and instruments will need to be submitted to the UIC IRB for approval prior to their use in the field. Please note that these documents, along with a statement regarding the translator's credentials and the accuracy of the translations, must be accompanied by an Amendment form when submitted to the UIC IRB.**

Dear Natthanaporn Sanguanklin:

Your Initial Review (Response to Modifications) was reviewed and approved by the Expedited review process on September 1, 2011. You may now begin your research

Please note the following information about your approved research protocol:

**Protocol Approval Period:** September 1, 2011 - August 30, 2012

**Approved Subject Enrollment #:** 400

**Additional Determinations for Research Involving Minors:** These determinations have not been made for this study since it has not been approved for enrollment of minors.

**Performance Sites:** UIC

**Sponsor:** None

**PAF#:** - Not Applicable

**Research Protocol(s):**

- a) Research Protocol\_Job strain, social support, coping strategies, and psychological distress in employed pregnant Thai women; Version 1; 08/08/2011

**Recruitment Material(s):**

- a) Script for recruitment; Version 1; 08/08/2011
- b) Confidentiality Agreement; Version 2; 08/15/2011
- c) Flyer; Version 2; 08/15/2011

**Informed Consent(s):**

- a) Informed Consent; Version 2; 08/15/2011
- b) Waiver of Signed Consent Document granted under 45 CFR 46.117 and alteration of consent granted for recruitment/eligibility screening process

Your research meets the criteria for expedited review as defined in 45 CFR 46.110(b)(1) under the following specific categories:

(5) Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis).

(7) Research on individual or group characteristics or behavior (including but not limited to research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

**Please note the Review History of this submission:**

Receipt Date	Submission Type	Review Process	Review Date	Review Action
08/09/2011	Initial Review	Expedited	08/11/2011	Modifications Required
08/29/2011	Response to Modifications	Expedited	09/01/2011	Approved

Please remember to:

→ Use your **research protocol number** (2011-0644) on any documents or correspondence with the IRB concerning your research protocol.

→ Review and comply with all requirements on the enclosure,  
"UIC Investigator Responsibilities, Protection of Human Research Subjects"

**Please note that the UIC IRB has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your**



research and the consent process.

**Please be aware that if the scope of work in the grant/project changes, the protocol must be amended and approved by the UIC IRB before the initiation of the change.**

We wish you the best as you conduct your research. If you have any questions or need further help, please contact OPRS at (312) 996-1711 or me at (312) 996-9299. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.

Sincerely,



Marissa Benni, M.S.  
IRB Coordinator, IRB # 2  
Office for the Protection of Research Subjects

Enclosure(s):

- 1. UIC Investigator Responsibilities, Protection of Human Research Subjects**
- 2. Informed Consent Document(s):**
  - a) Informed Consent; Version 2; 08/15/2011
- 3. Recruiting Material(s):**
  - a) Script for recruitment; Version 1; 08/08/2011
  - b) Confidentiality Agreement; Version 2; 08/15/2011
  - c) Flyer; Version 2; 08/15/2011

cc: Rosemary C. White-Traut, Women, Child, & Family Health Science, M/C 802  
Barbara L. McFarlin, Women, Child, & Family Health Science, M/C 802

UNIVERSITY OF ILLINOIS  
AT CHICAGO

Office for the Protection of Research Subjects (OPRS)  
Office of the Vice Chancellor for Research (MC 672)  
203 Administrative Office Building  
1737 West Polk Street  
Chicago, Illinois 60612-7227

**Approval Notice**  
**Amendment to Research Protocol and/or Consent Document – Expedited Review**  
**UIC Amendment # 1**

October 11, 2011

Natthananporn Sanguanklin, MS  
Women, Child, & Family Health Science  
845 South Damen  
Room 1116 CON, M/C 802  
Chicago, IL 60612  
Phone: (312) 823-0878 / Fax: (312) 996-8945

RE: **Protocol # 2011-0644**

**“Job Strain, Social Support, Coping Strategies, and Psychological Distress in  
Employed Pregnant Thai Women”**

Dear Natthananporn Sanguanklin:

Members of Institutional Review Board (IRB) #2 have reviewed this amendment to your research and consent form under expedited procedures for minor changes to previously approved research allowed by Federal regulations [45 CFR 46.110(b)(2)]. The amendment to your research was determined to be acceptable and may now be implemented.

Please note the following information about your approved amendment:

**Amendment Approval Date:** October 11, 2011

**Amendment:**

Summary: UIC Amendment #1 dated October 5, 2011 (Received by OPRS on October 6, 2011) is an investigator-initiated amendment to translate the approved study documents into Thai (Flyer, version 1, 9/5/2011; Confidentiality agreement, version 1, 8/25/2011; Recruitment Script, version 1, 9/5/2011; Information Sheet, version 1, 8/18/2011; Informed Consent, version 1, 9/5/2011; Socio-demographic data sheet, version 1, 8/8/2011; The State-Anxiety Scale, version 1, 9/26/2011; and memo regarding the credentials of the translator dated 9/20/2011 submitted).

**Approved Subject Enrollment #:** 400

**Performance Sites:** UIC

**Recruiting Materials:**

- a) Information Sheet (Thai version): Job strain, social support, coping strategies, and psychological distress in employed pregnant Thai women Version 1, 08/18/2011
- b) Confidentiality agreement (Thai version): Job strain, social support, coping strategies, and psychological distress in employed pregnant Thai women Version 1, 08/25/2011
- c) Recruitment Script (Thai version): Job Strain, Social Support, Coping Strategies, and Psychological Distress in Employed Pregnant Thai Women Version 1, 09/05/2011
- d) Flyer Thai version: Job strain, social support, coping strategies, and psychological distress in employed pregnant Thai women Version 1, 09/05/2011

**Informed Consent:**

- a) Informed consent (Thai version): Job strain, social support, coping strategies, and psychological distress in Employed Pregnant Thai Women Version 1, 09/05/2011

**Please note the Review History of this submission:**

Receipt Date	Submission Type	Review Process	Review Date	Review Action
10/06/2011	Amendment	Expedited	10/11/2011	Approved

Please be sure to:

→ **Use only the IRB-approved and stamped consent document enclosed with this letter when enrolling subjects.**

→ Use your research protocol number (2011-0644) on any documents or correspondence with the IRB concerning your research protocol.

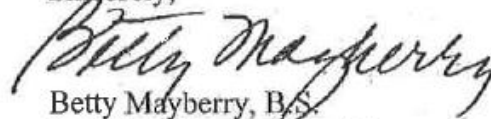
→ Review and comply with all requirements on the enclosure,  
**"UIC Investigator Responsibilities, Protection of Human Research Subjects"**

**Please note that the UIC IRB #2 has the right to ask further questions, seek additional information, or monitor the conduct of your research and the consent process.**

**Please be aware that if the scope of work in the grant/project changes, the protocol must be amended and approved by the UIC IRB before the initiation of the change.**

We wish you the best as you conduct your research. If you have any questions or need further help, please contact the OPRS at (312) 996-1711 or me at (312) 355-2764. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.

Sincerely,



Betty Mayberry, B.S.

IRB Coordinator, IRB # 2

Office for the Protection of Research Subjects

Enclosures:

- 1. UIC Investigator Responsibilities, Protection of Human Research Subjects**
- 2. Data Security Enclosure**
- 3. Informed Consent Document:**
  - a) Informed consent (Thai version): Job strain, social support, coping strategies, and psychological distress in Employed Pregnant Thai Women Version 1, 09/05/2011
- 4. Recruiting Materials:**
  - a) Information Sheet (Thai version): Job strain, social support, coping strategies, and psychological distress in employed pregnant Thai women Version 1, 08/18/2011
  - b) Confidentiality agreement (Thai version): Job strain, social support, coping strategies, and psychological distress in employed pregnant Thai women Version 1, 08/25/2011
  - c) Recruitment Script (Thai version): Job Strain, Social Support, Coping Strategies, and Psychological Distress in Employed Pregnant Thai Women Version 1, 09/05/2011
  - d) Flyer Thai version: Job strain, social support, coping strategies, and psychological distress in employed pregnant Thai women Version 1, 09/05/2011

cc: Barbara L. McFarlin, Faculty Sponsor, M/C 802  
Rosemary C. White-Traut, Women, Child, & Family Health Science, M/C 802

UNIVERSITY OF ILLINOIS  
AT CHICAGO

Office for the Protection of Research Subjects (OPRS)  
Office of the Vice Chancellor for Research (MC 672)  
203 Administrative Office Building  
1737 West Polk Street  
Chicago, Illinois 60612-7227

**Approval Notice**  
**Amendment to Research Protocol and/or Consent Document – Expedited Review**  
**UIC Amendment # 2**

November 28, 2011

Natthananporn Sanguanklin, MS  
Women, Child, & Family Health Science  
845 South Damen  
Room 1116 CON, M/C 802  
Chicago, IL 60612  
Phone: (312) 823-0878 / Fax: (312) 996-8945

**RE: Protocol # 2011-0644**  
**“Job Strain, Social Support, Coping Strategies, and Psychological Distress in**  
**Employed Pregnant Thai Women”**

Dear Natthananporn Sanguanklin:

Members of Institutional Review Board (IRB) #2 have reviewed this amendment to your research and/or consent form under expedited procedures for minor changes to previously approved research allowed by Federal regulations [45 CFR 46.110(b)(2) and/or 21 CFR 56.110(b)(2)]. The amendment to your research was determined to be acceptable and may now be implemented.

Please note the following information about your approved amendment:

**Amendment Approval Date:** November 23, 2011

**Amendment:**

Summary: UIC Amendment #2 dated November 22, 2011 (Received by OPRS on November 22, 2011) is an investigator-initiated amendment to add two items to the sociodemographic data sheet (version #2, 11/21/2011 submitted).

**Please note the Review History of this submission:**

Receipt Date	Submission Type	Review Process	Review Date	Review Action
11/22/2011	Amendment	Expedited	11/23/2011	Approved

Please be sure to:

→ **Use only the IRB-approved and stamped consent document(s) and/or HIPAA Authorization form(s) enclosed with this letter when enrolling subjects.**

→ Use your research protocol number (2011-0644) on any documents or correspondence with the IRB concerning your research protocol.

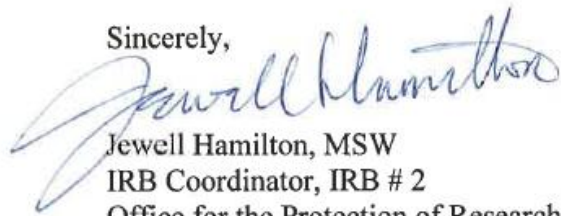
→ Review and comply with all requirements on the enclosure,  
**"UIC Investigator Responsibilities, Protection of Human Research Subjects"**

**Please note that the UIC IRB #2 has the right to ask further questions, seek additional information, or monitor the conduct of your research and the consent process.**

**Please be aware that if the scope of work in the grant/project changes, the protocol must be amended and approved by the UIC IRB before the initiation of the change.**

We wish you the best as you conduct your research. If you have any questions or need further help, please contact the OPRS at (312) 996-1711 or me at (312) 355-2939. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.

Sincerely,



Jewell Hamilton, MSW  
IRB Coordinator, IRB # 2  
Office for the Protection of Research Subjects

Enclosure(s):

**1. UIC Investigator Responsibilities, Protection of Human Research Subjects**

cc: Barbara L. McFarlin, Faculty Sponsor, Women, Child, & Family Health Science, M/C 802  
Rosemary C. White-Traut, Women, Child, & Family Health Science, M/C 802

UNIVERSITY OF ILLINOIS  
AT CHICAGO

Office for the Protection of Research Subjects (OPRS)  
Office of the Vice Chancellor for Research (MC 672)  
203 Administrative Office Building  
1737 West Polk Street  
Chicago, Illinois 60612-7227

**Approval Notice**

**Amendment to Research Protocol and/or Consent Document – Expedited Review  
UIC Amendment # 3**

February 13, 2012

Nathananporn Sanguanklin, MS  
Women, Child, & Family Health Science  
845 South Damen  
Room 1116 CON, M/C 802  
Chicago, IL 60612  
Phone: (312) 823-0878 / Fax: (312) 996-8945

RE: **Protocol # 2011-0644**  
**“Job Strain, Social Support, Coping Strategies, and Psychological Distress in  
Employed Pregnant Thai Women”**

Dear Dr. Sanguanklin:

Members of Institutional Review Board (IRB) #2 have reviewed this amendment to your research and/or consent form under expedited procedures for minor changes to previously approved research allowed by Federal regulations [45 CFR 46.110(b)(2)]. The amendment to your research was determined to be acceptable and may now be implemented.

Please note the following information about your approved amendment:

**Amendment Approval Date:** February 10, 2012

**Amendment:**

Summary: UIC Amendment #3 dated February 7, 2012 (received by OPRS February 8, 2012) is an investigator-initiated amendment to submit IRB approval from Thammasat University in Thailand (approval dated January 16, 2012 and good for two years).

**Approved Subject Enrollment #:** 400

**Performance Sites:** UIC, Bangphli Hospital, Thammasat University -  
Thailand

**Sponsor:** None

**PAF#:** Not Applicable

**Please note the Review History of this submission:**

Receipt Date	Submission Type	Review Process	Review Date	Review Action
02/08/2012	Amendment	Expedited	02/10/2012	Approved

Please be sure to:

→ Use your research protocol number ( 2011-0644) on any documents or correspondence with the IRB concerning your research protocol.

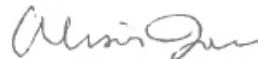
→ Review and comply with all requirements on the enclosure,  
**"UIC Investigator Responsibilities, Protection of Human Research Subjects"**

**Please note that the UIC IRB #2 has the right to ask further questions, seek additional information, or monitor the conduct of your research and the consent process.**

**Please be aware that if the scope of work in the grant/project changes, the protocol must be amended and approved by the UIC IRB before the initiation of the change.**

We wish you the best as you conduct your research. If you have any questions or need further help, please contact the OPRS at (312) 996-1711 or me at (312) 355-0816. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.

Sincerely,



Alison Jones, MSW, MJ  
 IRB Coordinator, IRB # 2  
 Office for the Protection of Research Subjects

Enclosure(s):

1. **UIC Investigator Responsibilities, Protection of Human Research Subjects**
- 2.

cc: Barbara L. McFarlin(Faculty Sponsor), Women, Child, & Family Health Science , M/C 802  
 Rosemary C. White-Traut, Women, Child, & Family Health Science, M/C 802



UNIVERSITY OF ILLINOIS  
AT CHICAGO

Office for the Protection of Research Subjects (OPRS)  
Office of the Vice Chancellor for Research (MC 672)  
203 Administrative Office Building  
1737 West Polk Street  
Chicago, Illinois 60612-7227

**Approval Notice****Amendment to Research Protocol – Expedited Review  
UIC Amendment # 4**

June 12, 2012

Natthananporn Sanguanklin, MS  
Women, Child, & Family Health Science  
845 South Damen  
Room 1116 CON, M/C 802  
Chicago, IL 60612  
Phone: (312) 823-0878 / Fax: (312) 996-8945

RE: **Protocol # 2011-0644**  
**“Job Strain, Social Support, Coping Strategies, and Psychological Distress in  
Employed Pregnant Thai Women”**

Dear Ms. Sanguanklin:

Members of Institutional Review Board (IRB) #2 have reviewed this amendment to your research under expedited procedures for minor changes to previously approved research allowed by Federal regulations [45 CFR 46.110(b)(2)]. The amendment to your research was determined to be acceptable and may now be implemented.

Please note the following information about your approved amendment:

**Amendment Approval Date:** June 12, 2012

**Amendment:**

Summary: UIC Amendment #4, dated 1 June 2011 and submitted 12 June 2012, is an investigator-initiated amendment regarding the following: (1) adding Queen Savang Vadhana Memorial Hospital as a research site (Appendix K; IRB approval, 4/3/2012) and (2) submission of funding support for this research (Appendix Z; Midwest Nursing Research Society award letter, 1/19/2012; College of Nursing PhD Student Research Award letter, 2/20/2012).

**Approved Subject Enrollment #:** 400

**Performance Sites:** UIC, Bangphli Hospital, Thammasat University -  
Thailand, Queen Savang Vadhana Memorial Hospital - Thailand

**Sponsor:** Midwest Nursing Society, Sigma Theta Tau  
**PAF#:** 2012-04390, Not applicable  
**Grant/Contract No:** Not applicable, Not applicable  
**Grant/Contract Title:** Not applicable, CON PhD Student Research Award

**Please note the Review History of this submission:**

Receipt Date	Submission Type	Review Process	Review Date	Review Action
06/12/2012	Amendment	Expedited	06/12/2012	Approved

Please be sure to:

→ Use your research protocol number (2011-0644) on any documents or correspondence with the IRB concerning your research protocol.

→ Review and comply with all requirements on the enclosure,  
**"UIC Investigator Responsibilities, Protection of Human Research Subjects"**

**Please note that the UIC IRB #2 has the right to ask further questions, seek additional information, or monitor the conduct of your research and the consent process.**

**Please be aware that if the scope of work in the grant/project changes, the protocol must be amended and approved by the UIC IRB before the initiation of the change.**

We wish you the best as you conduct your research. If you have any questions or need further help, please contact the OPRS at (312) 996-1711 or me at (312) 996-2014. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.

Sincerely,

*Sandra K Costello*

Sandra Costello  
 Assistant Director, IRB # 2  
 Office for the Protection of Research Subjects

**Enclosure: UIC Investigator Responsibilities, Protection of Human Research Subjects**

cc: Barbara L. McFarlin (faculty advisor), Women, Child, & Family Health Science, M/C 802  
 Rosemary C. White-Traut, Women, Child, & Family Health Science, M/C 802

UNIVERSITY OF ILLINOIS  
AT CHICAGO

Office for the Protection of Research Subjects (OPRS)  
Office of the Vice Chancellor for Research (MC 672)  
203 Administrative Office Building  
1737 West Polk Street  
Chicago, Illinois 60612-7227

**Approval Notice  
Continuing Review**

July 13, 2012

Natthananporn Sanguanklin, MS  
Women, Child, & Family Health Science  
845 South Damen  
Room 1116 CON, M/C 802  
Chicago, IL 60612  
Phone: (312) 823-0878 / Fax: (312) 996-8945

RE: **Protocol # 2011-0644**  
**“Job Strain, Social Support, Coping Strategies, and Psychological Distress in  
Employed Pregnant Thai Women”**

Dear Ms. Sanguanklin:

Your Continuing Review was reviewed and approved by the Expedited review process on July 9, 2012. You may now continue your research.

Please note the following information about your approved research protocol:

<b><u>Protocol Approval Period:</u></b>	July 9, 2012 - July 8, 2013
<b><u>Approved Subject Enrollment #:</u></b>	400 (limited to data analysis from 300 subjects)
<b><u>Additional Determinations for Research Involving Minors:</u></b>	These determinations have not been made for this study since it has not been approved for enrollment of minors.
<b><u>Performance Sites:</u></b>	UIC, Bangphli Hospital, Thammasat University - Thailand, Queen Savang Vadhana Memorial Hospital - Thailand
<b><u>Sponsor:</u></b>	Midwest Nursing Society, Sigma Theta Tau
<b><u>PAF#:</u></b>	2012-04390, Not available
<b><u>Grant/Contract No:</u></b>	Not available, Not available
<b><u>Grant/Contract Title:</u></b>	Not available, CON PhD Student Research Award
<b><u>Research Protocol(s):</u></b>	

- b) Research Protocol\_Job strain, social support, coping strategies, and psychological distress in employed pregnant Thai women; Version 1; 08/08/2011

**Recruitment Material(s):**

- d) N/A: Limited to data analysis only

**Informed Consent(s):**

c) N/A: Limited to data analysis only

Your research meets the criteria for expedited review as defined in 45 CFR 46.110(b)(1) under the following specific category(ies):

(5) Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis)., (7) Research on individual or group characteristics or behavior (including but not limited to research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

**Please note the Review History of this submission:**

Receipt Date	Submission Type	Review Process	Review Date	Review Action
07/05/2012	Continuing Review	Expedited	07/09/2012	Approved

Please remember to:

→ Use your **research protocol number** (2011-0644) on any documents or correspondence with the IRB concerning your research protocol.

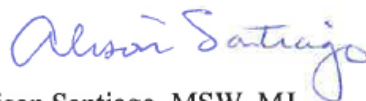
→ Review and comply with all requirements on the enclosure,  
**"UIC Investigator Responsibilities, Protection of Human Research Subjects"**

**Please note that the UIC IRB has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.**

**Please be aware that if the scope of work in the grant/project changes, the protocol must be amended and approved by the UIC IRB before the initiation of the change.**

We wish you the best as you conduct your research. If you have any questions or need further help, please contact OPRS at (312) 996-1711 or me at (312) 355-0816. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.

Sincerely,



Alison Santiago, MSW, MJ  
 IRB Coordinator, IRB # 2  
 Office for the Protection of Research Subjects

Enclosure(s):

**4. UIC Investigator Responsibilities, Protection of Human Research Subjects**

**5. Data Security Enclosure**

cc: Rosemary C. White-Traut, Women, Child, & Family Health Science, M/C 802  
Barbara L. McFarlin(Faculty Sponsor),Women, Child, & Family Health Science , M/C  
802  
OVCR Administration, M/C 672

# APPENDIX A

## Thammasat University IRB Letter of Approval



Human Research Ethics Committee of Thammasat University (No.2)

Number of COA... 062/2554.....

Project No... 064/2554.....

Title of Project... Job Stress, Social Support, Coping Strategies, and Psychological Distress in Enrolled Program Thai Women.....

Principal Investigator... Miss Nantanaaporn Sangsri.....

Study Center... Faculty of Nursing.....

Responsible Department... ..

Document Reviewed 1. Research Protocol.....

2. Information Sheet.....

This document is a record of review and approval / acceptance of a clinical study protocol. The Human Research Ethics Committee of Thammasat University (No.2) : approved the above study and the following documents for use in the study at the EC meeting on ..... 5 .....

Approval period ..... 2 ..... years

Progress report deadline ..... 16 January, 2013 .....

Signed: 

(Dr. Winichakul Seiwai)

Secretary of the Human Research Ethics Committee of Thammasat University (No.2)

Signed: 

(Assoc. Prof. Dr. Thirawat Burakongkarn)

Chairman of the Human Research Ethics Committee of Thammasat University (No.2)

Date of Approval ..... 16 January, 2552 .....

## APPENDIX A

## Queen Savang Vadhana Memorial Hospital IRB Letter of Approval



## Certificate of Ethical Approval

Research and Ethic Committee Queen Savang Vadhana Memorial Hospital  
290 Choemchongel Rd., Siracha, Chonburi 20110, Thailand.

This Certificate of Ethical Approval applies to the

**Study Title:** Job Strain, Social Support, Coping Strategies, and Psychological Distress  
in Employed Pregnant Thai Women

**Study Center:** Queen Savang Vadhana Memorial Hospital

**Principal Investigator:** Miss Nathananporn Sangumklin

**PLACE OF PROPOSED STUDY:** Queen Savang Vadhana Memorial Hospital  
290 Choemchongel Road, Siracha, Chonburi 20110, Thailand.

The committee has reviewed and approved/acknowledged the documents as detailed below for the study

- 1) Research Protocol; English version
- 2) Informed Consent Form; Thai version 1.0 Edit date 25 August 2011
- 3) Participant Information sheet; Thai version 1.0 Edit date 18 August 2011
- 4) The package of questionnaires consists of:
  - a) A socio-demographic data sheet
  - b) The Perceived Stress Scale
  - c) The Job Content Questionnaire
  - d) The Medical Outcome Study-Social Support Survey
  - e) The Ways of Coping Checklist-Revised
  - f) The State Anxiety Scale
  - g) The Center for Epidemiological Studies-Depression Scale (CES-D)

Signature Jutatip Nirutirug M.D. Signature Chaivej Nuchprayoon  
(Jutatip Nirutirug, MD) (Chaivej nuchprayoon, MD)

Chairman of Research and Ethic Committee

Hospital Director

Date 29 March 2012

Date 3 April 2012



Queen Savang Vadhana Memorial Hospital

Research and Ethic Committee (25 March 2008 – Present)

Member Title and Name	Occupation (position)	Qualification (if applicable)	Male/Female (M/F)	Yes/No
<u>Chairman</u> Mrs. Jutatip Nirattirug	Chief of Pediatric Department	M.D. Pediatrician	F	✓
<u>Vice Chairman</u> Mr. Wanchai Nityaraksaew	Chief of Medical Record	M.D. Urology	M	✓
<u>Member</u> Ms. Kamsiri Charoenthammachoke	Chief of Medical Laboratory Department	Medical Technologist B.Sc.	F	✓
<u>Miss Jutalak Baranee</u>	R.N.	Assistant Professor	F	✓
Mr. Wichien Julasareekul	Medical officer, Department of Internal Medicine	M.D. M.Sc.	M	✓
Miss Jutana Malai	Nurse	Master degree ; Nurse Epidemiologist	F	✓
Mrs. Patita Jaroenlarpitankul	Public Relations Officer	Master degree ; Educational Technology	F	✓
<u>Secretary</u> Mrs. Saitip Amponhong	Nurse	Master degree ; Nursing	F	✓
<u>Assistant Secretary</u> Miss Chonrutai Yeekian	R.N.	M.N.S	F	✓

For Protocol: Job Strain, Social Support, Coping Strategies, and Psychological Distress in Employed Pregnant Thai Women

Signature: Jutatip Nirattirug M.D. Date of Approval: 29 March 2012  
 Name: Jutatip Nirattirug, MD  
 Title: Chairman of Research and Ethic Committee

Signature: Chaivej Nuchprayoon Date: 3 April 2012  
 Name: Chaivej Nuchprayoon, MD  
 Title: Hospital Director

Queen Savang Vadhana Memorial Hospital

Address 280 Chomchoeng Road, Srinakharinwirot, Bangkok, 10110 Thailand

Tel: 66-011-320-200 Ext 3457 Fax: 66-011-320-200 Ext 3459



## APPENDIX A

### Bang Phli Hospital Letter of Approval

Samutprakarn Provincial Health Office  
19 Soi 35 Aussawanon 2 Sukhumvit Rd.  
Tambon Paknam, Amphur Muang  
Samutprakarn, Thailand

July 2011

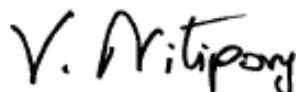
Chairperson of the Institutional Review Board (IRB) Committee  
203 Administrative Office Building  
1737 W. Polk Street  
Chicago, IL 60612-7227 USA

Dear Sir/Madam:

This letter provides support for Ms. Natthanaporn Sanguanklin, a Ph.D. student at the College of Nursing, University of Illinois at Chicago, to collect the required data for her doctoral dissertation at Bangphli Hospital, Samutprakarn Province, Thailand. I have reviewed Ms. Sanguanklin's proposed study "Job Strain, Social Support, Coping Strategies, and Psychological Distress in Employed Pregnant Thai Women." I understand that the subjects are volunteers and that they are able to withdraw from the study at any point without any interference or adverse effects regarding their care. Anonymous questionnaires, which I also understand will be used to collect the data for the proposed study, assure that individual subjects cannot be identified and the information will be kept confidential.

I, as head of Samutprakarn's Public Health Office, hereby give permission to Ms. Sanguanklin to conduct her doctoral dissertation at Bangphli Hospital. Please feel free to contact me either at the above address or at telephone number 011-66-2389-5980 ext. 102 if you have any questions or require additional information.

Sincerely,



Veerapol Nitipong, MD  
Head of Samutprakarn Public Health Office

## APPENDIX B

## Approval Letter in Using the Thai Translated Version of Questionnaires

For use by Natthanaporn Sanguanklin only. Received from Mind Garden, Inc. on September 26, 2011



[www.mindgarden.com](http://www.mindgarden.com)

To whom it may concern,

This letter is to grant permission for the above named person to use the following copyright material;

Instrument: ***State-Trait Anxiety Inventory for Adults***

Authors: ***Charles D. Spielberger, in collaboration with R.L. Gorsuch, G.A. Jacobs, R. Lushene, and P.R. Vagg***

Copyright: ***1968, 1977 by Charles D. Spielberger***

for his/her thesis research.

Five sample items from this instrument may be reproduced for inclusion in a proposal, thesis, or dissertation.

The entire instrument may not be included or reproduced at any time in any other published material.

Sincerely,

Robert Most  
Mind Garden, Inc.  
[www.mindgarden.com](http://www.mindgarden.com)



Women, Children, and Family Health Science  
UIC College of Nursing (M/C 802)  
845 South Damen Avenue  
Chicago, Illinois 60612-7350

June 13, 2011

Sukanlaya Sawang, B.sc (HONS), M. Arts, PhD.  
QUT Business School,  
Queensland University of Technology, Australia

**Sent Via Email**  
[s.sawang@qut.edu.au](mailto:s.sawang@qut.edu.au)

Dear Dr. Sukanlaya Sawang:

I am writing this letter to request permission to use your instrument, the Ways of coping checklist-revised (The WCCL-R). I would like to use the Thai version of your instrument to measure coping strategies used in employed pregnant Thai women. The title of my study is "Job Strain, Social Support, Coping Strategies, and Psychological Distress in Employed Pregnant Thai Women". Acknowledgement of your authorship of the instrument will be given properly. The permission letter will be attached in the appendix section of my dissertation.

Would you please kindly indicate your permission and return a signed copy of the letter in the electronic format at your earliest convenience to [nsangu2@uic.edu](mailto:nsangu2@uic.edu).


Thank you very much for your time and your kind consideration.

Sincerely,

A handwritten signature in black ink that reads "Natthanaporn Sanguanklin".

Natthanaporn Sanguanklin, MSN, RN  
Ph. D. Candidate

The above request is approved.

Approved by  \_\_\_\_\_ Date 15<sup>th</sup> June 2011  
Sukanlaya Sawang, PhD

June 15, 2011

Re: A permission to use T-PSS-10

To: Natthanaporn Sanguanklin:

You are welcome to use the Thai version of PSS-10 in your study with no further permission requirements. The scale and the link for the full-paper can be found at

<http://sites.google.com/site/gpsychiatrycmu/dr.wongpakaran%27publication>

Please do not hesitate to contact me if you require further information. We would be interested if you could share your findings once your study has ended.

Yours,



Nahathai Wongpakaran, MD, FRCPsychT

Assistant Professor, Department of Psychiatry, Chiang Mai University  
110 Intawaroros Rd., Tambon Sriphum, Amphoe Mueang, Chiang Mai  
Thailand 50200

Email: [nkuntawo@med.cmu.ac.th](mailto:nkuntawo@med.cmu.ac.th) Tel: +6653945422 to 4 ext. 320, Fax: +6653945426

**UIC** COLLEGE OF  
UNIVERSITY OF ILLINOIS  
AT CHICAGO NURSING

Women, Children, and Family Health Science  
UIC College of Nursing (M/C 802)  
845 South Damen Avenue  
Chicago, Illinois 60612-7350

November 1, 2011

Dr. Malatee Rungruangsiripan  
Division of Psychiatric and Mental Health Nursing,  
Ramathibodi School of Nursing,  
Faculty of Medicine Ramathibodi Hospital,  
Mahidol University, Thailand

Sent Via Email  
ramru8@yahoo.com

Dear Dr. Malatee Rungruangsiripan:

I am writing this letter to request permission to use your instrument, the Medical Outcome Study-Social Support Survey (The MOS-SSS). I would like to use the Thai version of your instrument to measure levels of social support in employed pregnant Thai women. The title of my study is "Job Strain, Social Support, Coping Strategies, and Psychological Distress in Employed Pregnant Thai Women". Acknowledgement of your authorship of the instrument will be given properly. The permission letter will be attached in the appendix section of my dissertation.

Would you please kindly indicate your permission and return a signed copy of the letter in the electronic format at your earliest convenience to [nsangu2@uic.edu](mailto:nsangu2@uic.edu).

Thank you very much for your time and your kind consideration.

Sincerely,

*Nathananporn Sanguanklin*

Nathananporn Sanguanklin, MSN, RN  
Ph. D. Candidate

The above request is approved.

Approved by R. Malatee Date Nov 1, 2011

**UIC** COLLEGE OF  
NURSING

Women, Children, and Family Health Science  
UIC College of Nursing (X1C 802)  
845 South Damen Avenue  
Chicago, Illinois 60612-7350

September 23, 2011

Chayanin Boonpongmanee, Ph.D., RN  
Administrator  
Tri-Cities Digestive Health  
Mid-Columbia Endoscopy Center, LLC  
8819 W. Victoria Ave  
Kennewick, WA 99336

Sent Via Email  
boybon@yahoo.com

Dear Dr. Chayanin Boonpongmanee:

I am writing this letter to request permission to use your instrument, the Center for Epidemiological Studies-Depression Scale (The CES-D) (Thai version). I would like to use the Thai version of your instrument to measure the level of depressive symptomatology in employed pregnant Thai women. The title of my study is "Job Strain, Social Support, Coping Strategies, and Psychological Distress in Employed Pregnant Thai Women". Acknowledgement of your authorship of the instrument will be given properly. The permission letter will be attached in the appendix section of my dissertation.

Would you please kindly indicate your permission and return a signed copy of the letter in the electronic format at your earliest convenience to [jsanguan2@uic.edu](mailto:jsanguan2@uic.edu).

Thank you very much for your time and your kind consideration.

Sincerely,

*Natthananporn Sanguanklin*

Natthananporn Sanguanklin, M.S., RN  
Ph. D. Candidate

The above request is approved.

Approved by



Date

9/23/11

## APPENDIX C

### Questionnaires

#### Perceived Stress Scale-10

The questions in this scale ask you about your feelings and thoughts **during the last month**. In each item, you will be asked to circle the appropriate number, indicating **how often you felt or thought** a certain way.

0 = Never      1 = Almost Never      2 = Sometimes      3 = Fairly Often      4 = Very Often

1.	In the last month, how often have you been upset because of something that happened unexpectedly?	0	1	2	3	4
2.	In the last month, how often have you felt that you were unable to control the important things in your life?	0	1	2	3	4
3.	In the last month, how often have you felt nervous and “stressed”?	0	1	2	3	4
4.	In the last month, how often have you felt confident about your ability to handle your personal problems?	0	1	2	3	4
5.	In the last month, how often have you felt that things were going your way?	0	1	2	3	4
6.	In the last month, how often have you found that you could not cope with all the things that had to do?	0	1	2	3	4
7.	In the last month, how often have you been able to control irritations in your life?	0	1	2	3	4
8.	In the last month, how often have you felt that you were on top of things?	0	1	2	3	4
9.	In the last month, how often have you been angered because of things that were outside of your control?	0	1	2	3	4
10.	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	0	1	2	3	4

**Thai Job Content Questionnaires**

The questions in this scale ask you about your feelings related to your work. In each item, you will be asked to indicate how you feel about your work by circling the appropriate number.

1= strongly disagree

2= disagree

3= agree

4= strongly agree

1.	Develop own abilities	1	2	3	4
2.	Lots of say	1	2	3	4
3.	Requires creative	1	2	3	4
4.	Have important role in making decisions	1	2	3	4
5.	Allow own decisions	1	2	3	4
6.	High skill level	1	2	3	4
7.	Learn new things	1	2	3	4
8.	Democracy environment	1	2	3	4
9.	Intense concentration	1	2	3	4
10.	Chance to be promoted	1	2	3	4
11.	In the next 5 years, your skill still be useful	1	2	3	4
12.	Repetitive work	1	2	3	4
13.	Variety work	1	2	3	4
14.	Allow decision freedom	1	2	3	4
15.	Hectic job	1	2	3	4
16.	Work hard	1	2	3	4
17.	Don't have enough time to rest	1	2	3	4
18.	Excessive work	1	2	3	4
19.	Task interrupt	1	2	3	4
20.	Work fast	1	2	3	4
21.	Low salary/ stipend	1	2	3	4

The following questions ask you about your feelings relate to your supervisors and/ or your co-workers.

1= strongly disagree

2= disagree

3= agree

4= strongly agree

35.	Supervisor is concerned	1	2	3	4
36.	Supervisor good organizer	1	2	3	4
37.	Helpful supervisor	1	2	3	4
38.	Supervisor pays attention	1	2	3	4
39.	Coworkers helpful	1	2	3	4
40.	Friendly coworkers	1	2	3	4
41.	Coworkers competent	1	2	3	4
42.	Coworker interest in me	1	2	3	4



### The Medical Outcome Study Social Support Survey (Thai Version)

1. How many supporters (e.g. partner, relatives, and close friends) do you have? \_\_\_\_\_

The following questions ask you about the support that is available to you. In each item, you will be asked to indicate how often the following kinds of support are available to you by circling the appropriate number.

1 = none of the time

2 = a little of the time

3 = some of the time

4 = most of the time

5 = all the time

2.	Someone to help you if you were confined to bed	1	2	3	4	5
3.	Someone to give you good advice about a crisis	1	2	3	4	5
4.	Someone to take you to the doctor if you needed it	1	2	3	4	5
5.	Someone who shows you love and affection	1	2	3	4	5
6.	Someone to give you information to help you understand a situation	1	2	3	4	5
7.	.....	1	2	3	4	5
8.	.....	1	2	3	4	5
9.	.....	1	2	3	4	5
10.	Someone to do things with to help you get your mind off things	1	2	3	4	5
11.	Someone to help you with daily chores if you were sick	1	2	3	4	5
12.	Someone to share your most private worries and fears with	1	2	3	4	5
13.	Someone to turn to for suggestions about how to deal with a personal problem	1	2	3	4	5
14.	Someone to do something enjoyable with	1	2	3	4	5
15.	Someone who understand your problems	1	2	3	4	5
16.	Someone to love and make you feel wanted	1	2	3	4	5

**The Ways of Coping Checklist-Revised**

The questions in this scale ask you about **coping strategies**. In each item, you will be asked to indicate **how often** you used the listed coping strategy by circling the appropriate number.

0 = never used

1 = sometimes

2 = fairly often

3 = regularly use

1.	Bargained or compromised to get something positive from the situation	0	1	2	3
2.	Concentrated on something good that could come out of the whole thing	0	1	2	3
3.	Tried not to burn my bridges behind me, but left things open somewhat	0	1	2	3
4.	Changed or grew as a person in a good way	0	1	2	3
5.	Made a plan of action and followed it	0	1	2	3
6.	Accepted the next best thing to what I wanted	0	1	2	3
7.	Came out of the experience better than when I went in	0	1	2	3
.	.....	0	1	2	3
.	.....	0	1	2	3
.	.....	0	1	2	3
37.	Got mad at the people or things that caused the problem	0	1	2	3
38.	Tried to forget the whole thing	0	1	2	3
39.	Tried to make myself feel better by eating, drinking, smoking, taking medications	0	1	2	3
40.	Avoided being with people in general	0	1	2	3
41.	Kept others from knowing how bad things were	0	1	2	3
42.	Refused to believe it had happened	0	1	2	3

**The State Anxiety (Form Y-1)**

The questions in this scale ask you about your feelings right now, at this moment. There is no right or wrong answer. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best

1 = not at all

2 = somewhat

3 = moderately so

4 = very much so

1.	I feel calm	1	2	3	4
2.	I feel secure	1	2	3	4
3.	I feel tense	1	2	3	4
4.	I feel strained	1	2	3	4
5.	.....	1	2	3	4
6.	.....	1	2	3	4
7.	.....	1	2	3	4
8.	.....	1	2	3	4
9.	.....	1	2	3	4
10.	.....	1	2	3	4
11.	.....	1	2	3	4
12.	.....	1	2	3	4
13.	.....	1	2	3	4
14.	.....	1	2	3	4
15.	.....	1	2	3	4
16.	.....	1	2	3	4
17.	I am worried	1	2	3	4
18.	I feel confused	1	2	3	4
19.	I feel steady	1	2	3	4
20.	I feel pleasant	1	2	3	4

### The Center for Epidemiological Studies-Depression Scale (CES-D)

The questions in this scale ask you about your feelings and thoughts **during the past week**. In each item, you will be asked to indicate **how often** you felt or thought in a certain way by circling appropriate number

0 = rarely/ none of the time (less than a day)

1 = some of the time (1 – 2 days)

2 = occasionally (3 – 4 days)

3 = most or all of the time (5 – 7 days)

1.	I was bothered by things that usually do not bothered me	0	1	2	3
2.	I did not feel eating, my appetite was poor	0	1	2	3
3.	I felt that I could not shake off the blues even with help from my family and friends	0	1	2	3
4.	I felt that I was just as good as other people	0	1	2	3
5.	I had trouble keeping my mind on what I was doing	0	1	2	3
6.	I felt depressed	0	1	2	3
7.	I felt that everything I did was an effort	0	1	2	3
8.	I felt hopeful about the future	0	1	2	3
9.	I thought my life had been a failure	0	1	2	3
10.	I felt fearful	0	1	2	3
11.	My sleep was restless	0	1	2	3
12.	I was happy	0	1	2	3
13.	I talked less than usual	0	1	2	3
14.	I felt lonely	0	1	2	3
15.	People were unfriendly	0	1	2	3
16.	I enjoyed life	0	1	2	3
17.	I had crying spells	0	1	2	3
18.	I felt sad	0	1	2	3
19.	I felt that people dislike me	0	1	2	3
20.	I could not get “going”	0	1	2	3

## **VITA**

**NAME** Natthananporn Sanguanklin

### **CURRENT POSITION**

2002 - Present Instructor, Faculty of Nursing, Thammasat University  
Pathum Thani, Thailand

### **ACADEMIC BACKGROUND**

2008 - 2013 Ph.D. in Nursing Science  
University of Illinois at Chicago, College of Nursing, Chicago, Illinois  
2000 - 2002 Master of Science in Nursing  
Mahidol University, School of Nursing, Faculty of Medicine  
Ramathibodi Hospital, Bangkok, Thailand  
1993 - 1996 Bachelor of Science in Nursing  
Mahidol University, Faculty of Nursing, Bangkok, Thailand

### **PREFESSIONAL EXPERIENCE**

2002 - 2008 Lecturer, Department of Family and Midwifery, Faculty of Nursing,  
Thammasat University, Thailand  
2002 - 2008 Member of Quality Assurance Committee. Faculty of Nursing,  
Thammasat University, Thailand  
2006 - 2008 Member of Child and Development Center Committee. Faculty of  
Nursing, Thammasat University, Thailand  
1997 - 2000 Registered Nurse, Post-partum Unit, Siriraj Hospital, Bangkok, Thailand

### **AWARDS AND SCHOLARSHIPS**

2000 - 2002 Scholarship from Ministry of Science (Master degree), Thailand  
2008 - 2013 Scholarship from Ministry of Science (Doctoral degree), Thailand  
2011 GSNO Travel Award, University of Illinois at Chicago, IL, U.S.A.  
2011 Health Professionals Student Council Award, University of Illinois at  
Chicago, IL, U.S.A.  
2011 Virginia M. Ohlson International Studies Scholarship, College of Nursing,  
University of Illinois at Chicago, IL, U.S.A.  
2011 The Alice J. Dan Dissertation Award: Honorable Mention  
2012 The Midwest Nursing Research Society: Beverly J. McElmurry  
Dissertation Award

**AWARDS AND SCHOLARSHIPS (continued)**

2012	Alpha Lambda Chapter, Sigma Theta Tau International Honor Society of Nursing: Research Award 2011- 2012
2012	The UIC CON Ph.D. Alumni Research Fund: Ph.D. Student Research Award
2012	Thai Scholar Innovation in U.S.A. and Canada Program
2013	Dr. Beverly J. McElmurry Scholarship Award, College of Nursing, University of Illinois at Chicago, IL, U.S.A.

**PROFESSIONAL MEMBERSHIPS**

1996 - Present	Thai Nursing Association, Thailand
1996 - Present	Thai Council Nursing Association
2010 - Present	Alpha Lambda Chapter, Sigma Theta Tau International
2010 - Present	Midwest Nursing Research Society (MNRS)
2011 - Present	The Council for the Advancement of Nursing Science (CANS)

**LICENSURE**

1997 - Present	Registered Professional Nursing and Midwifery, First Class Thailand License
----------------	---

**LEADERSHIP ROLE**

2011	International Student Representative, the Global Health Leadership Organization Advisory Committee, University of Illinois at Chicago, IL, U.S.A.
------	---

**RESEARCH AND SCHOLARY ACTIVITES****Publications**

Phumonsakul, S., Leardmaleewong, M., & **Sanguanklin, N.** (2006). Effects of newborn interactive bath teaching on maternal attachment, role satisfaction, and competency in infant behavioral learning of first-time mothers. *Ramathibodi Nursing Journal*, 12 (2), 107-117.

Giurgescu, C., **Sanguanklin, N.**, Engeland, C., Mathews, H. White-Traut, R. & Witek Janusek, L. Relationships among psychosocial factors, biomarkers, gestational hypertension/preeclampsia, and preterm birth in pregnant African American women. Manuscript revised and resubmitted to *Journal of Obstetrics, Gynecology and Neonatal Nursing*.

**Manuscripts in Preparation**

**Sanguanklin, N.,** McFarlin, B., Park, C., Finnegan, L., Giurgescu, C., White-Traut, R., & Engstrom, J. Job Strain and Psychological Distress among Employed Pregnant Thai Women: Role of Social Support and Coping Strategies.

**Sanguanklin, N.,** McFarlin, B., Park, C., Finnegan, L., Giurgescu, C., White-Traut, R., & Engstrom, J. The impact of displacement on birth outcomes following the 2011 flood in Thailand.

**Presentations**

**Sanguanklin, N.,** Phumonsakul, S. & Lerdmaleewong, M. (2003, October). Effects of Newborn Interactive Bath Teaching on Maternal Attachment, Role Satisfaction, and Competency in Infant Behavioral learning of First-time Mothers. Nursing: Challenges in Achieving Universal Coverage of Health Care, Bangkok, Thailand.

**Sanguanklin, N.,** McFarlin, B., Park, C., Finnegan, L., Giurgescu, C., White-Traut, R., & Engstrom, J. (2013, March). *Job Strain and Psychological Distress among Employed Pregnant Thai Women: Role of Social Support and Coping Strategies*. Paper presented at the 37<sup>th</sup> Midwest Nursing Research Society Conference, Chicago, Illinois.

**Sanguanklin, N.,** Mathews, H., Witek Janusek, L., & Giurgescu, C. (2011, March). *Relationships among psychological factors, biomarkers, gestational hypertension/preeclampsia, and preterm birth in pregnant African American women*. Poster Discussion at the 35<sup>th</sup> Midwest Nursing Research Society Conference, Columbus, Ohio.

Giurgescu, C, **Sanguanklin, N.,** Engeland, C., Mathews, H., & Witek Janusek, L. (2011, November). *Relationships among psychological factors, biomarkers, gestational hypertension/preeclampsia, and preterm birth in pregnant African American women*. Poster presented 14<sup>th</sup> World Congress on Controversies in Obstetrics, Gynecology & Infertility, Paris, France.