-
# THE EFFECTS OF JOB DEMANDS, JOB CONTROL, AND JOB SUPPORT ON JOB STRESS AMONG INTRAPARTUM NURSES IN THAILAND: A CAUSAL MODEL

SIRINTHIP BOONDUAYLAN

Burapha University

2022

-

ศิรินทร์ทิพย์ บุญด้วยลาน

THE EFFECTS OF JOB DEMANDS, JOB CONTROL, AND JOB SUPPORT ON
JOB STRESS AMONG INTRAPARTUM NURSES IN THAILAND: A CAUSAL
MODEL

SIRINTHIP BOONDUAYLAN

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DOCTOR DEGREE OF PHILOSOPHY
IN NURSING SCIENCE
FACULTY OF NURSING
BURAPHA UNIVERSITY
2022

The Dissertation of Sirinthip Boonduaylan has been approved by the examining committee to be partial fulfillment of the requirements for the Doctor Degree of Philosophy in Nursing Science of Burapha University

Advisory Committee

.................................................... Principal advisor
(Associate Professor Dr. Chintana Wacharasin)

.................................................... Co-advisor
(Associate Professor Dr. Wannee Deoisres)

Examining Committee

.................................................... Principal examiner
(Associate Professor Dr. Gunyadar Prachusilpa)

.................................................... Member
(Associate Professor Dr. Chintana Wacharasin)

.................................................... Member
(Associate Professor Dr. Wannee Deoisres)

.................................................... Member
(Associate Professor Dr. Pornpat Hengudomsub)

.................................................... Member
(Associate Professor Dr. Puangpaka Kongvattananon)

This Dissertation has been approved by the Faculty of Nursing to be partial fulfillment of the requirements for the Doctor Degree of Philosophy in Nursing Science of Burapha University

.................................................... Dean of the Faculty of Nursing
(Assistant Professor Dr. Pornchai Jullamate)

....................................................

SIRINTHIP BOONDUAYLAN : THE EFFECTS OF JOB DEMANDS, JOB CONTROL, AND JOB SUPPORT ON JOB STRESS AMONG INTRAPARTUM NURSES IN THAILAND: A CAUSAL MODEL. ADVISORY COMMITTEE: CHINTANA WACHARASIN, Ph.D., WANNEE DEOISRES, Ph.D. 2022.

Intrapartum nurses are subjected to job stress in an environment that includes multiple stressors. Working conditions include increasing job demands, low control over their job situations, and a lack of job support from supervisors and colleagues that contribute to the negative emotional reactions or job stress among intrapartum nurses. Job stress is a major issue that threatens not only individuals but also hospital organizations. The main purpose of this study was to test a causal model of effects of job demands, job control, and job support on job stress among intrapartum nurses in Thailand. A total of 272 intrapartum nurses working at a tertiary hospital under supervison of Ministry of Public Health were recruited using multistage sampling technique. A set of questionnaires were used to collect data. The structural equation model has been tested by using the AMOS software application.

The results showed that the final model fit the empirical data ($\chi2$ = 57.76, df = 22, CMIN/df = 2.62, GFI =.96, AGFI =.91, CFI =.95, and RMSEA =.07). Among the variables tested, job demands were the strongest predictors of job stress, and high job control can contribute to job stress. While job support has no effect on job stress. The effects of job demands, job control, and job support on job stress among intrapartum nurses in Thailand can explain 67% of the total variance for job stress.

These findings suggest that intrapartum nurses who encounter high job demands and less job control would suffer from job stress. Therefore, strategies to decrease job stress among intrapartum nurses could focus on how to balance job demands, and enhance job control and job support. Nurse administrators should be aware of this issue in order to protect intrapartum nurses resigned their nursing profession, which leads to the most intense nursing shortage.

# ACKNOWLEDGEMENTS

I would like to express my sincere gratitude and deep appreciation to my major advisor, Associate Professor Dr.Chintana Wacharasin, and my co-advisor, Associate Professor Dr.Wannee Deoisres, who gave me not only substantive guidance but also support and encouragement throughout the study. All the questions from them inspired me to move forward and succeed. I genuinely appreciate the worthy suggestions and valuable advice of an external examiner, Associate Professor Dr.Gunyadar Prachusilpa, and Associate Professor Dr.Puangpaka Kongvattananon. A great appreciation goes to Assistant Professor Dr.Pornchai Jullamate and all the faculty members at the Faculty of Nursing, Burapha University, for their support, suggestions, and encouragement throughout the study.

I am grateful to the director of hospitals, the depute of nurses of all regional hospitals under the jurisdiction of the Ministry of Public Health, Thailand, and all of the Institutional Review Board for giving me permission to conduct research. I also would like to express special thanks to all of the intrapartum nurses' participants for their kindness and collaboration.

I am also indebted to many of my colleagues in the Faculty of Nursing, Srinakharinwirot University who have taken on my responsibilities during my absence. I would like to express my deepest appreciation to Srinakharinwirot University, which granted me financial support throughout my program of study. Besides, I am thankful to my Ph.D. classmates for their time, care, and support.

My special thanks go to my mother and my father for their love, support, and encouragement to pursue this degree.

Finally, I would like to take this opportunity to express my deepest thanks to my husband, Group Captain Noppadol, my lovely sons, Bhumtham and Kritthanat, and also my lovely daughter Naphatsirinth, who have always believed in my decision and embraced every moment of pleasure and sadness with me. Without their unconditional love, constant understanding, encouragement, and never-ending support, I would never be able to complete my dissertation and study.

Sirinthip  Boonduaylan

# TABLE OF CONTENTS

**Page**

# LIST OF TABLES

# LIST OF FIGURES

**Page**

# CHAPTER 1
# INTRODUCTION

## Statements and significance of the problems

Job stress or stress associated with work has been known as the greatest source of everyday stress in adults' lives and has long been recognized the effect of stress on health. According to the National Institute of Safety and Health [NIOSH] (1999) job stress can be defined as the harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources, or needs of the worker. Concordance with Karasek (1979) states that job stress is undesirable stress-like reactions that occur to workers facing high psychological workload demands or pressures combined with low control or decision latitude in meeting those demands. Other definitions emphasize that job stress as a particular individual's discomfort or emotional response when one's skills, resources, and demands do not fit the requirements of a job (Kikuchi et al., 2014; Najimi, Goudarzi, & Sharifirad, 2012; Parker & DeCotiis, 1983; Shin & Lee, 2016). These definitions clearly illustrates that job stress can be damaging and destructive to physical health and emotional distress to workers (Gheshlagh et al., 2017; Karasek & Theorell, 1990).

It is acknowledged that job stress in the nursing profession is the highest levels, and many nurses have experience job stress (Park & Kim, 2013; Sarafis et al., 2016; Yu et al., 2014). Job stress among nurses can be conceptualized as a nurse individual's reactions to the work environment which indicates a poor fit between the individual's abilities, excessive demands, or the individual is not fully equipped to handle a particular situation that appears to be a threat to the individual (Gheshlagh et al., 2017; Jamal & Baba, 2000). It can be seen that the nature of nursing is a demanding job requiring high skill, constant alertness, strong team collaboration, and the provision of 24-hour care (Edmonds & Jones, 2013; Van Bogaert, et al., 2014), high job demand, ranging from work overload, time pressures, and lack of role clarity in dealing with infectious diseases and difficult and ill, helpless patients (Centers for Disease Control and Prevention [CDC], 2008). Furthermore, health services are currently facing very tight competition, demands of the best possible service, and also

an expectation from patients to provide high-quality nursing service (Park & Kim, 2013). These determinants, as a result, nurses encounter job stress inescapably. A number of studies about job stress have been done that focus on the effects of job stress on mental and physical health problems in workers, such as depression, burnout, and cardiovascular disease. Most studies emphasize that job stress affects healthcare organizations such as commitment, dissatisfaction, and intention to leave the organization more than they focus on job stress that poses a threat to the unpleasant emotions and suffering among nurses.

Nurses who encounter job stress for a long time will be affected by negative emotions and feelings. It contributes to health problems in nurses and decreases their efficiency. A systematic review which has been conducted on the consequences and complications of job stress among professional nurses found that is highly vulnerable to individual nurses' physical and psychological health, functioning, and safety (Pisanti, van der Doef, Maes, Lazzari, & Bertini, 2011). Its side effects become clear in the form of tiredness, anxiety, depression, stress, burnout, an increase in blood pressure, heart disease, ulcers, sleeping disorders, skin rashes, headache, neck- and backache, low resistance to infections (Najimi et al., 2012; Nixon, Mazzola, Bauer, Krueger, & Spector, 2011). Moreover, these impacts lead to  lack of self-confidence, decrease efficiency, contention between coworkers, the decline in the quality of nursing care, the decrease in performing duties among nurses and finally, intention to leave their nursing profession (Agheli, Roshangar, Parvan, Sarbakhsh, & Shafeh, 2017).

Job stress among nurses not only adversely affects the health, safety, and well-being of nurses at the individual level, it also negatively affects the patients and healthcare organizations (Chaudhari, Mazumdar, Motwani, & Ramadas, 2018; Keykaleh et al., 2018). The observed consequences of prolonged job stress among nurses were found to be the effects on the patients and healthcare organizations. For patients, such as the frequency of patient safety-related incidents, incorrect documentation, near misses in medication errors, and delays in the delivery of patient care (Elfering, Semmer, & Grebner, 2006). For healthcare  organizations, such as job absenteeism, lack of job satisfaction, lack of quality in job performance, decrease productivity, reduced enthusiasm, lack of care for the organization and staff,

irresponsibility (Dagget, Molla, & Belachew, 2016; Dewe & Kompier, 2008; Najimi et al., 2012), and increase the financial costs of the organization for solving problems by job stress (Hassard, Teoh, Visockaite, Dewe, & Cox, 2017). One of the most important  organizational issues are nurses continue to leave their workplace before reaching the age of retirement (Kaewboonchoo, Yingyuad, Rawiworrakul, & Jinayon, 2014) and finally, the global nursing shortage has occurred (Alomani, 2016; Roberts et al., 2012) which are the results of job stress among nurses.

In the past few decades, empirical evidence has accumulated regarding the epidemiology of job stress among nurses have a rising trend. The epidemiological design study among 983 nurses in 21 Slovenian hospitals found that the prevalence of high levels of job stress among nurses was 56.5% of respondents (Dobnik, Maletič, & Skela-Savič, 2018). A meta-analysis on the prevalence of work stress in nurses revealed that 69% of nurses in the United Arab Emirates experienced stress (Gheshlagh et al., 2017). In South West Ethiopia, were found to be 32.7 % of nurses had high job stress (Dagget et al., 2016). In addition, the study from Australia found that 32.4% of nurses had depression, 41.2% had anxiety and 41.2% experienced stress related to work (Maharaj, Lees, & Lal, 2018). Studies in Thailand revealed that 36.6% of nurses who have worked in the university hospital have a higher level of stress than normal (Wattanakitkrileart, Naksawasdi, Cheewapoonphon, & Sattayawiwat, 2010). Another study in Ratchaburi public hospitals, Thailand, showed that over a quarter of the respondents were categorized into the high-risk group for job stress which was significantly related to workload and social support (Aoki, Keiwkarnka, & Chompikul, 2011). Moreover, a cross-sectional study of 2,084 registered nurses working in 94 community hospitals across Thailand found that higher nurse burnout was associated with negative patient outcomes including patient falls, medication errors, and infections (Nantsupawat, Nantsupawat, Kunaviktikul, Turale, & Poghosyan, 2016).

Several studies showed that nurses indeed report job-related stress at a high level (Clegg, 2001; McVicar, 2003; Sharma et al., 2014). It is thus not surprising that large international studies have shown that nurses are particularly vulnerable to job stress (Hasselhorn, Tackenberg, & Müller, 2003; McVicar, 2003). Specific nursing specialties imply however exposure to specific stressors (Browning, Ryan, Thomas,

Greenberg, & Rolniak, 2007). Most research has been pointing special attention among nurses, those who work in emergency care units (Adriaenssens, De Gucht, & Maes, 2015; Lu et al., 2015; Yuwanich et al., 2018) or intensive care units (Johan, Sarwar, & Majeed, 2017; Kumar, Pore, Gupta, & Wani, 2016) as a professional group continuously exposed to worrying levels of stress, in their work environment. However, differences in job stress between nurses from these different types of units involved in acute care have never been extensively investigated, which is also the case for intrapartum nurses. Due to the variation in the nature of the labor room [LR], intrapartum nurses are exposed to a broad variety of stressors and are constantly changing, including hectic and hardly predictable work conditions that complicate pregnancy.

The restructuring of the health care system and the shortage of nursing staff put Thai nurses at increased risks of exposure to high psychological job demands at any level of public hospitals. Especially, the tertiary hospitals are the highest stay in hospitals in Thailand. These hospitals having the capacity to receive patients from a hospital of lower levels because it has sufficient state-of-the-art equipment for diagnosis and treatment (Thrathip & Chantima, 2015). Similarly, intrapartum nurses in these hospitals must also have specialist training in order to provide high-quality medicalization and birthing care. (Healy, Humphreys, & Kennedy, 2016). Incidents and emergency situations amongst laboring, birthing, and postpartum women such as some emergencies are truly sudden and catastrophic, such as a ruptured aneurysm, massive pulmonary embolus, preterm labor, and complete abruption placenta The (American college of obstetricians and gynecologists [ACOG], 2014). The intrapartum nurses are responsible for key clinical decisions and provide the majority of direct clinical care at the bedside (Edmonds & Jones, 2013). They spend more time with women in labor than health care providers (Gagnon, Meier, & Waghorn, 2007). Common clinical practices for which nurses have primary responsibility include the triage and admission process, maternal/ fetal assessment, management of oxytocin infusions, management of pain, and management of second-stage care (Simpson, 2005). These high demands of the job can be led to job stress among intrapartum nurses.

Awareness of the expectation of pregnant women and families about the perfection of delivery and demands for the best possible service is one of the pressures and causes of job stress of intrapartum nurses (Chou, 2006). The death of a child, maternal or both is profoundly stressful, demanding, and difficult which is a specific stressor (Wallbank & Robertson, 2013). Particularly, the prosecution is one of the main causes of stressful work among intrapartum nurses and even contributing to burnout, emotional exhaustion, and distress (Hildingsson, Westlund, & Wiklund, 2013; Wallbank & Robertson, 2013). Besides, intrapartum nurses experienced work-related stress due to: insufficient work resources, shortage of staff, the poor organization at work, communication with supervisors, time pressures, lack of role clarity, emotional work, death and dying, conflicts with physicians or colleagues, pressure from family members, and workload or prolonged duty hours were the most cited as job stressors (Bánovčinová, 2017; CDC, 2008; IOL, 2016). For this reason, intrapartum nurses had more job stress than nurses working in another field (Nowrouzi et al., 2015a).

Previous studies on intrapartum nurses showed various degrees of job stress. For example, one Croatian study reported that over 76.7% believed that their job was stressful, and considered that insufficient work resources caused the most stress (Golubic, Milosevic, Knezevic, & Mustajbegović, 2009). A study from Mashhad, Iran also demonstrated that moreover, 59.3% of the studied midwives who work in public hospitals and health centers had severe job stress (Kordi et al., 2014). An Australian study revealed that around 20% of midwives reported moderate/ severe/ extreme levels of depression (17.3%); anxiety (20.4%), and stress (22.1%) symptoms (Creedy, Sidebotham, Gamble, Pallant, & Jennifer, 2017). Nevertheless, in Thailand, most studies had been conducted in general professional nursing or healthcare provider (Aoki et al., 2011; Jirapongsuwan, Likitpornswan, Triamchaisri, & Chandanasotthi, 2011; Kaewboonchoo et al., 2014). The studies in Thailand are also limited in specific studied locations and which not emphasizes the importance of job stress among intrapartum nurses.

Job demand-control-support [JDCS] model, also called the Job Strain model, was developed by Karasek and Theorell (1990) that one of the most popular and appropriate job stress model among nurses. Naturally, the nursing profession poses

some demands and needs and high control (Karasek & Theorell, 1990). Job demands refer to the workload and have been operationalized mainly in terms of time pressure and role conflict. Job control, which is sometimes called decision latitude, refers to the person's ability to control his or her work activities. Decision latitude includes two components: skill discretion and decision authority. Then lastly, social support or job support is defined as the "overall levels of helpful social interaction available on the job from both co-workers and supervisors" (Karasek & Theorell, 1990). JDCS model postulated that the combination of high job demands and low job control and low social support lead to job stress (iso-strain hypothesis). On the other hand, job control and job support can reduce job stress by performing as a buffer the potential negative effects of high job demands (buffer hypothesis). This model suggests that the effects of high job demands, low job control, and low social support lead to job stress.

Numerous studies indicated that high job demands have a significant effect on job stress (Brennan & Lo, 2011; Lo, Chien, Hwang, Huang, & Chiou, 2017; Navajas-Romero, Ariza-Montes, & Hernández-Perlines, 2020) whereas job control combined with job support can improve job stress as well (Blanch, 2016; Yang et al., 2018). More relevant studies also point out the importance of job support that can contribute to promoting job control to workers (Vera, Martínez, Lorente, & Chambel, 2015). In addition, job support from supervisors and colleagues helps to improve their skill discretion and decision authority of workers (Karasek & Theorell, 1990).

Presently, there is a plethora of knowledge in this area. Numerous empirical studies in Asian countries, including Thailand, focused on various aspects of the nurses' burnout syndromes and nurses' satisfaction and/ or dissatisfaction with the organization. Moreover, most of the knowledge comes out of the perspectives of nurses in general contexts and critical care nurses (e.g., emergency nurses, intensive care nurses, and psychiatric nurses). Whilst, knowledge regarding intrapartum nurses' job stress is not always clear and tends to be limited. For this reason, this study will emphasize intrapartum nurses who work in the tertiary hospital due to they provide nursing care in an environment which can be extremely busy, constantly changes, and facing unpredictable demands for maternity. These increase the chance that intrapartum nurses experiencing much more job stress than nurses who work in general areas. However, there is no study on the structure of the exact cause of job

stress among intrapartum nurses in Thailand, particularly since the onset of the national economic crisis, social changing, and the trends to increase of the prosecution from patient and family.

Therefore, the purpose of this study was to test a causal model of the effect of job demands, job control, and job support on job stress among intrapartum nurses. Furthermore, the findings of this study might be used to suggest organizational changes and develop strategies to balance the work environment and reinforce existing knowledge about the relationship between job control and job support in order to reduce job stress and improve the quality of life of nurses affected by job stress.

## Research objective

The objective of this study was to test the hypothesized causal model of the effect of job demand, job control, and job support on job stress among intrapartum nurse.

## Research hypotheses

1. Job demands have a direct positive effect on job stress and have an indirect effect on job stress among intrapartum nurses through job control and job support.

2. Job control has a direct negative effect on job stress among intrapartum nurses.

3. Job support has a direct negative effect on job stress and has an indirect effect on job stress among intrapartum nurses through job control.

## Conceptual framework

The conceptual framework of this study was guided by Job demand-control-support [JDCS] model also known as the Job Strain model (Karasek & Theorell, 1990) and research evidences. The model consists of job demands, job control, and job support. Job demands in terms of JDCS model refer to the psychological stressors involved in accomplishing the workload, stressors related to unexpected tasks, and

stressors of job-related personal conflict (Karasek, 1979). Job control (also termed decision latitude) was composed of two constructs: skilled discretion and decision autonomy. Skilled discretion refers to the skill and creativity required to do one's job. Decision autonomy refers to organizationally mediated opportunities for workers to make decisions about their work (Karasek et al., 1998). Job support refers to positive or helpful social interaction available from superiors or managers, and colleagues in the workplace (Karasek & Theorell, 1990). Supervisor's and colleague's support have something in common, as they are both considered coping resources in the workplace to buffer the impact of job-related stress on employees (Karasek, Triantis, & Chaudhry, 1982).

This model suggested that relationships among three main variables contribute to job stress as following two hypotheses: The "iso strain" hypothesis and the "buffer" hypothesis. The "iso strain" hypothesis, stating that the highest level of psychological distress is expected when workers perceive high demands, low control, and low social support. The "buffer" hypothesis, predicting that job control and job support can buffer the potential negative effects of high demands on job stress. People who are exposed high demand situations when combined with low job control (e.g., low skill discretion, low decision authority, etc.) result in workers perceiving their job stress as the highest and this subsequently results in the most harm to their health (Cole, Ibrahim, & Shannon, 2005; Karasek, 1979). Therefore, job stress is feelings of unpleasant emotions or reactions which occur to workers facing high psychological workload demands or pressures combined with low control or decision latitude in meeting those demands (Karasek, 1979).

Several studies review that the mechanism of job support plays an important role in buffering the effect against stress (Marcelissen et al., 1988) through job control as well. Job support is potentially helpful to developing their job control and decreases job stress because job support from supervisors can contribute to promoting work skills and job performance (Nagami, Tsutsumi, Tsuchiya, & Morimoto, 2010; Vera, Martínez, Lorente, & Chambel, 2015) and job support from colleagues may be both emotional and physical support, it would be a great benefit in reducing working stress (Nagami et.al., 2010).

According to concept and research evidence, in this study of intrapartum nurses, the conceptual framework presents high job demand situations when combined with low job control (e.g., low skill discretion, low decision authority, etc.) and low support from supervisors and colleagues, resulting in intrapartum nurses perceiving their job stress as the highest. While high demands increase job stress, job control and job support can help intrapartum nurses reduce the negative impacts of high demands on job stress. In conclusion, job stress occurs when job demands exceed an individual's ability to control and low job support them, which appears in the form of workers' feelings of unpleasant emotions or reactions and poses a threat to the individual, resulting in job stress. Therefore, the hypothesized model of this conceptual framwork is proposed and illustrated in Figure 1.
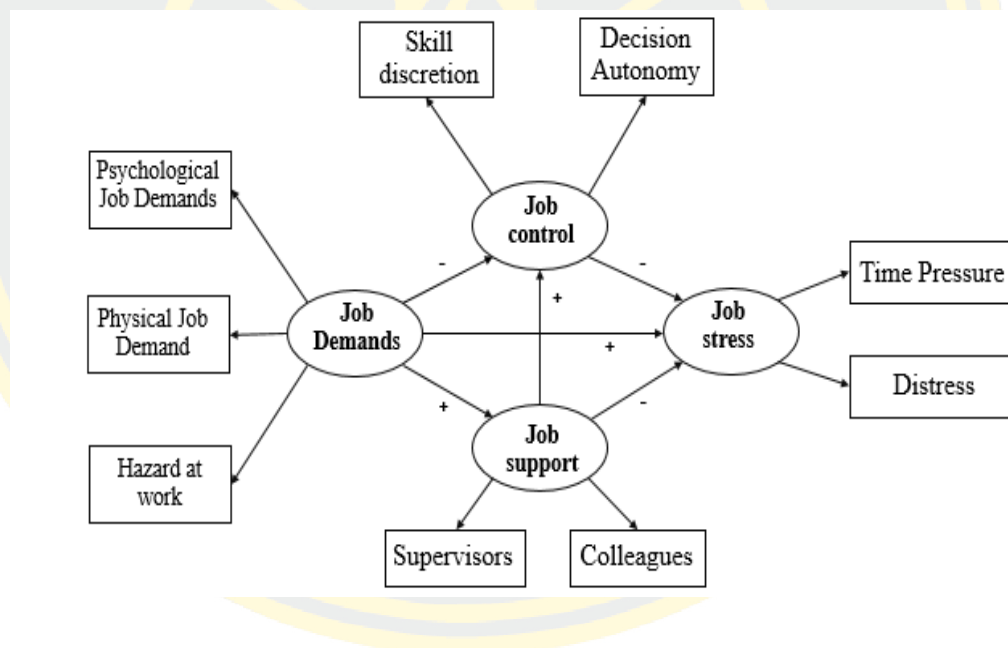


Figure 1 The hypothesized model of the effects of job demands, job control, and job support on job stress among intrapartum nurses.

## Scope of the study

The study of intrapartum nurses used a model-testing research design aimed to test the hypothesized causal model of job stress among intrapartum nurses. The data were collected from registered nurses [RNs] who have been working in the labor

room for at least six months in regional hospitals under the jurisdiction of the Ministry of Public Health, Thailand, from May-December 2020.

## Definition of terms

The following definitions of the term are defined in this study:

**Job stress** refers to intrapartum nurses' perceptions as an internal condition or feeling of unpleasant emotions or reactions in the form of time pressure and distress, as a result of perceived insufficient work resources or disturbing circumstances in the workplace that pose a threat to them.

**Job demands** are defined as all task requirements, workload, role, interpersonal, hazards at work, and physical characteristics of intrapartum nurses that require sustained physical and/ or psychological effort to complete those demands and hazards at work.-It was measured by the Thai version of the Job Content Questionnaire [TJCQ] (Phakthongsuk, 2009).

**Job control** refers to intrapartum nurses' perception of their ability to decide what skills to use to complete the job, autonomy, and decisions to solve when they face problems in their job. It was measured by the Thai version of the Job Content Questionnaire [TJCQ] (Phakthongsuk, 2009).

**Job support** refers to intrapartum nurses' perception or feelings about the various types of task assistance for coping with work-related problems that they receive from colleagues and/or supervisors in the labor room. It was measured by the Thai version of the Job Content Questionnaire [TJCQ] (Phakthongsuk, 2009).

# CHAPTER 2
# LITERATURE REVIEWS

This chapter presents literature review of the relevant concepts, theories, and previous research evidence of the following:

1. An overview of job stress

2. Job stress among intrapartum nurses

2.1 Intrapartum nurse in Thai health care system

2.2 Intrapartum nurses in the regional hospitals

2.3 Overview of job stress among intrapartum nurses

2.4 Causes of job stress among intrapartum nurses

2.5 Consequences of job stress among intrapartum nurses

3. Job demand-control-support model (JCDS model)

3.1 Overview of Job Demand-Control-Support model (JCDS model)

3.2 The effect of job demands on job stress

3.3 The effect of job control on job stress

3.4 The effect of job support on job stress

3.5 The effect of job support on job control and job stress

4. Summary the effects of job demands, job control, and job support on job stress

## An overview of job stress

Over the past several decades, interest in the phenomenon of job stress has increased markedly, as indicated by several reviews of the literature, many books, and researches all of the global. In research studies "job stress" has been variously termed as "occupational stress" and "workplace stress". All these constructs overlap each other with minor distinctiveness. Job stress refers to an adverse reaction that damage emotion, cognitive, behavioral and physiological reactions state which results from excessive job pressures and job demands while cannot the disparity of the level of control (Karasek, 1979; Wazqar, Kerr, Regan, & Orchard, 2017). Still, another definition identified that job stress refers to job-related nervousness and anxiety when

workers feel an imbalance between their work demands and their capability and/ or resources to meet these demands (Narban, Narban, & Singh, 2016).

Job stress results from the interaction of the worker and work conditions. In terms of workers, differences in personal characteristics such as skills, personality, and coping can be very important in predicting that certain job conditions will result in stress (NIOSH, 1999). The Job Demands-Control-Support model (JDCS model) has also been studied in conjunction with personality traits, in particular, type A behavior and locus of control. Karasek and Theorell (1990) found that type A individuals' need for control makes the experience of having low control more exacerbating; they are also at higher risk of heart disease when exposed to high strain.

Karasek and Theorell (1990) view job stress as a strategic communication of distress. Toohey (1995) states that job stress may be expressed through illness behavior, which is assessed as a safe and acceptable manner in which to communicate distress. Therefore, characteristics of job stress are represented with the feeling of an inability to cope effectively, change in emotional status, discomfort, communication of discomfort, anxiety, and depression, low self-esteem, and low ability to concentrate, participate in social life and make decisions (Koutsimani, Montgomery, & Georganta, 2019; Sarafis et.al., 2016). As a basis, experts claim that depression and anxiety, as well as the physiological symptoms linked with those moods, are increasingly applied to measure the consequences of job stress and health-related quality of life (Van der Doef & Maes, 1999; Viertiö et al., 2021).

In summary, job stress is the reactions of emotional, cognitive, behavioral and physiological that deleterious to workers which result from job content exceed more than control and low job support. It is a state characterized by high levels of arousal and distress and often by feelings of not coping. The response to the job stress of the worker may be positive or negative, depending on the type of demands and worker's ability amount of control their job includes the amount of support they receive and Individual response. Therefore, some situations, what is a stressful job for one person may not be a problem for someone else.

## Job stress among intrapartum nurses

### Intrapartum Nurses in Thai Health Care System

In Thailand, nurse-midwives work in the antenatal unit, labor room, and post-partum ward at all health care setting levels from primary to tertiary health care. Nurse-midwives are health professionals who specialize in caring for childbearing women (Liblub, Gum, & Bazargan, 2020). They were trained health professionals who care for pregnant women, supporting women and their families, providing consultation, performing normal vaginal deliveries for normal pregnancies, and are responsible for taking care of low-risk pregnancies including assisting them to maintain healthy pregnancies (Government, 1997). At present, the great majority of Thai women give birth in hospitals (National Statistical Office of Thailand, 2020; Yuenyong, Jirapaet, & O'Brien, 2008). Therefore, nurse-midwives were the main group of health care providers that provided obstetric care in Thailand (Prapawichar et.al., 2020). Especially most direct clinical care in the intrapartum period is provided by intrapartum nurses (Edmonds & Jones, 2013).

The role and nurse-midwifery practice broadly, according to the Professional Nursing and Midwifery Act B.E. 2528 (1985) Revision of the Act B.E. 2540 (1997) stated that the practitioner of the nursing and midwifery profession refers to a person who has been registered and received a license granted by the Nursing and Midwifery Council (TNMC) to perform both professions. This means that practitioners of the nursing and midwifery profession can be nursing care and midwifery for pregnant women, post-delivery women, their newborns, and families are in the following actions: 1) to provide education, advice, counseling, as well as solving health problems; 2) to act and assist pregnant women, post-delivery women, and their newborns' physical and mental health in order to prevent complications during pregnancy, delivery, and post-delivery; 3) to provide treatment, as mentioned in primary medical care and immunization; 4) to provide physical examinations, delivery of the baby and family planning services; and 5) to assist physicians to perform the treatment. These actions shall be based on scientific principles and the art of midwifery in performing health assessment, nursing diagnosis, planning, intervention, and evaluation (Government, 1997).

The role and scope of practice of intrapartum nurses, are guided by the standards of practice, which declare in the Regulations of the Thailand Nursing and Midwifery Council (TNMC) on restrictions and conditions for nursing and midwifery practices, B.E. 2564 (2021) Section 4: Professional practice of midwifery, Part 2: Intrapartum nursing care. The standards of practice are as follows.

1. Professional nurse, midwife, or nurse-midwife at the First Class can be conducting normal vaginal births for low-risk pregnant and normal labor including caring for post-delivery women, and their newborns.

2. Professional nurse, midwife, or nurse-midwife at the First Class must midwifery care for pregnant women before intrapartum stage as follows:

2.1 Assessment of pregnant women in the prenatal period

2.1.1 Assessment of pregnancy history and other medical history related to pregnancy and childbirth

2.1.2 Assessment of abdomen in labor

2.2 Fetal assessment

2.2.1 Assessment of fetal heart rate

2.2.2 Assessment and estimated fetal weight

2.2.3 Assessment of fetal presentation and position

2.3 Assessment of labor progress as follow: uterine contractions, the opening and thinning of the cervix by vaginal (PV) examination, fetal presentation and position, movement of the fetal presentation part, and labor rupture of the membranes.

3. Intrapartum Nursing Care

3.1 Provided nursing care of pregnant women with induction and augmentation of labor.

3.2 Conducting normal vaginal delivery, performing an episiotomy, cord-cutting, and immediate care of the newborn.

3.3 Performing placenta delivery by the Modified Credé Maneuver method. If retained placenta occurs, considering performing placenta delivery by the controlled cord traction. If the placenta is not delivered, notify the physicians or refer them to a medical facility that is ready immediately.

3.4 Perineal suturing in the case of no more than a second-degree tear

3.5 Blood loss assessment

3.6 Assessing blood loss

3.7 Vital signs assessment immediately after delivery and before removal to the recovery room

4. Assisting physicians in performing the curative treatment in case of an abnormal delivery such as the anterior shoulder dystocia, assisting physicians in performing forceps and vacuum extractor deliveries, or assisted cesarean section, and assisting in performing obstetric procedures that are safe for pregnant women.

5. Professional nurse, midwife, or nurse-midwife at the first class is not permitted these procedures as follows:

5.1 Amniocentesis

5.2 Conducting delivery with abnormal pregnancy such as breech presentation, twin birth, umbilical cord prolapse, transverse fetal lie, or cephalopelvic disproportion [CPD], etc.

5.3 Remove placenta by invasive techniques or manual removal of placenta

5.4 Internal and external cephalic version

5.5 The acupressure points on the abdomen for inducing labor

5.6 Perineal suturing in the case of third-degree tear

5.7 Termination of pregnancy

6. Professional nurse, midwife, or nurse-midwife at the First Class can be conducting delivery in case of an emergency birth, complication case that cannot be detected before delivery, and in case of might harm to the mother and the baby while without physicians to manage in the critical time. However, do not permit to use of high forceps extraction delivery, vacuum-assisted delivery, perform cesarean sections, and administration of an uterotonic agent prior to delivery.

7. In the case of postpartum hemorrhage, intrapartum nurses have to assess and initiating emergency treatment as needed as necessary and notify the physicians or refer them to a medical facility that is ready immediately.

Hence, all intrapartum nurses must practice under these regulations in order to control the quality of care and patient safety.

**Intrapartum nurses in the regional hospitals, Thailand**

Regional hospitals refer to the tertiary hospitals located in provincial centers of each region of Thailand. These hospitals having a minimum capacity of 500 beds and the potential in treating more complicated diseases than general or secondary hospitals. Due to the high potential of these hospitals and have sufficient of state-of-the-art equipment for diagnosis and treatment (Thrathip & Chantima, 2015), they serve as the main referral hub for complicated illnesses from community hospitals. They also admit patients with more complicated conditions and provide more advanced medical services than the community hospitals (Puenpatom & Rosenman, 2008). In addition, they are medical school and provide specialty training disciplines courses in the related fields.

Principally, these hospitals have specialists in all fields and are equipped with advanced support systems. For the obstetric department, regional hospitals have obstetricians with a subspecialty in maternal-fetal medicine qualifications in delivering babies and providing medical care to women during pregnancy (antenatal care) and after birth (postnatal care) who are more skillful in treating maternal and fetal than general obstetricians. Besides, these hospitals have intrapartum nurses who are experienced and efficient in the nursing care of pregnant women with complex diseases and abnormal labor.

Due to technological advancements and the medicalization of childbirth, midwifery clinical practice is becoming increasingly complex (Healy et al., 2016). These factors led to complications with pregnancy, which have contributed to an increase in critical events and emergency circumstances among women in labor, delivery, and postpartum (Adriaenssens et al., 2015). As a consequence, those characteristics, as well as the potential of regional hospitals previously mentioned, have a significant influence on determining the workload of intrapartum nurses.

The scope of practice and workforce of intrapartum nurses in regional hospitals are shaped by the hospital structure and with reference to TNMC. Whilst nurses' staffing and scheduling are administrated by supervisors (Sathira-Angkura, Jamsomboon, Wongsuvansiri, Leelawong, & Boonkaew, 2019) and follow by the policy of the nurse division. With respect to critical care of obstetrics and labor room workload, intrapartum nurses who work in regional hospitals frequently requirement

of job demands different from other hospital levels and not only provide midwifery care for normal vaginal delivery but also nursing care for abnormal pregnancy. They must continually enhance their skills and competencies in new sciences and technologies through research and applications of new medical treatment and nursing care for better outcomes (Karami, Farokhzadian, & Foroughameri, 2017). In addition, intrapartum nurses are the key resources in the labor room. They make substantial contributions to healthcare delivery systems especially in routine nursing care, acute care, and advanced nursing care (Buakhai & Rithpho, 2019).

These are examples of intrapartum nurses' tasks that established by regional hospitals and TNMC (Thadakant & Kritsupalerk, 2009) including routine nursing-midwifery care. For example, Taking history and history related to pregnancy, performing auscultation and assessing fetal heart sound, monitor and time contractions during labor and delivery, pain management, and other administrator medications by following the order of the obstetrician including conducting vaginal delivery and performing newborn health examination. In addition to routine care of normal labor, intrapartum nurses have nursing care of pregnant women with complications during pregnancy such as preterm labor, premature rupture of membranes [PROM], pregnancy-induced hypertension [PIH]. They provide nursing care of pregnant women during childbirth with obstructed labor such as shoulder dystocia, fetal malpresentation such as breech position including complications in puerperium such as postpartum hemorrhage [PPH]. They communicate with the obstetrician to provide timely, accurate information and identify complications in order to prepare for an emergency cesarean (C-section), including assisting newborn resuscitation.

To be consistent with workload and workforce, Nursing regulation (1997) stipulates intrapartum nurses-to-patient ratio of 2:1 for the tertiary hospitals. In the practical found that the regional hospitals confront the serious shortage of registered nurses. Consequently, the workload imbalance and unsolved workforce among nurses (Dumrongsiri & Chongphaisa, 2018). These determinants lead to job stress among intrapartum nurses.

**Overview of job stress among intrapartum nurses**

One of the workplaces dominated by stress is the health care sector and the nursing profession is one of the jobs that the highest level of job stress (Gheshlagh et al., 2017; Sarafis et al., 2016). Job stress among nurses is the emotional and physical reactions resulting from the interactions between the nurse and his or her work environment where the demands of the job exceed capabilities and resources (Almendra, 2010; Kokoroko & Sanda, 2019). Therefore, the job stress among nurses is stress at work specific to the nature of the nursing field.

Job stress among intrapartum nurses based on underlying anxiety consists of a feeling of uncertainty that arose because of their concern about the status of the birth unit in aspiring to provide best practice during the intrapartum period (Chabeli, Malesela, & Nolte, 2017). For example, nursing care during the first stage of delivery, this period usually arises adverse events or emergencies such as prolonged labor, fetal distress, prolapse of the umbilical cord, intrapartum fetal surveillance and attending this period are a vital task and challenging for intrapartum nurses (Kunsiripunyo, 2019). These situations lead to intrapartum nurses confront of job stress.

Job stress among intrapartum nurses is reflected in the physical, emotional, psychological and social aspects. The reactions of job stress among intrapartum nurses is to show emotional signs of stress (despair, concern, irritability, angry outbursts, dissatisfaction, oversensitivity, lack of self-respect and energy, fear, etc.), as well as intellectual and mental signs of stress (feeling of incompetence, incompletion of tasks, trouble concentrating, inability to think clearly, irrationality, unreasonable decisions, etc.) (Starc, 2018).

The previous study has shown that 76.7% of midwives in the healthcare setting believed their job was stressful and insufficient work resources caused the most stress (Knezevic et al., 2011). Previous studies have reported the common stressors in the work of midwives that associated with effort-reward imbalance, low organizational justice, role stress, being unsupported, experiencing conflict, long hours, job insecurity, an insufficient number of colleagues, conflicts with co-workers and physicians, or dealing with unreasonable demands from patients (Bánovčinová, 2017; Cramer & Hunter, 2019). Similarly, a qualitative study in obstetrical nursing from Ontario, Canada also, demonstrated that workplace stress, relationships with

colleagues (in and out of the workplace), quality of work-life of obstetrical nurses, changes in care delivery and model of care (cross-training), and limited resources in the workplace are causes of job stress among obstetrical nurses (Nowrouzi et al., 2015b).

In summary, intrapartum nurses are in high job stress that emerged from a particular nurse individual's awareness or feeling of personal dysfunction. Job stress among intrapartum nurses is a result of perceived conditions or happenings in the work setting. Moreover, inevitably, those intrapartum nurses have to encounter psychological job demands, highly physical, and demanding jobs. In Thailand, every registered nurse also becomes a licensed midwife at initial registration (Thadakant, West, Allnutt, & Boontong, 2009; Buakhai & Rithpho, 2019). Therefore, regarding nursing practice for maternal and child in Thailand, the role of midwifery has been incorporated into nurses, the medical system. More than 90% in Thailand, pregnant women were attended and deliver by intrapartum nurses (WHO, 2013). According to the literature review, there was no evidence-based or no investigate related to job stress among intrapartum nurses. Although, intrapartum nurses are the primary caretakers of laboring women.

### Causes of job stress among intrapartum nurses

Job stress has long been recognized as a challenge for the nursing profession. It is clear that the causes of job stress among nurses are work overload and failure to fulfill the patient's needs (Bai & Ravindran, 2019; Keykaleh et.al., 2018). In actuality, it cannot only be identified that only one or two causes of job stress are present but also having plentiful causes that contribute to job stress among nurses. Understanding and recognizing the causes of job stress among nurses, on the other hand, is critical for resolving and reducing job stress among nurses.

Numerous research represented that the sources of job stress among nurses differ by area, country, organization, department, nursing specialty, and personality (Nabirye, 2010; Haque, 2014). This has been attributed to the different health systems, their culture, availability of resources, nature of work, different educational levels, age, employment contract, work experience and personality traits (Baye, Demeke, Birhan, Semahegn, & Birhanu, 2020; Bhui, Dinos, Galant-Miecznikowska, de Jongh, & Stansfeld, 2016; Lindholm, 2006). Similarly, intrapartum nurses

experience different job stress than other nurses. Because of the medicalization of delivery (Healy et al., 2016), the variety of pathology, and the unexpected and continuously changing nature of complicated pregnancy, intrapartum nursing care have become more difficult work in recent years.. Theses work conditions have contributed to a rise in critical incidents and emergency situations amongst laboring, birthing and postpartum women (Geraghty, Speelman, & Bayes, 2019) such as eclampsia, shoulder dystocia, amniotic fluid embolism, and postpartum hemorrhage (ACOG, 2014).

Furthermore, intrapartum nurses may experience psychological job demands different other nurses who work in another area. "Vicarious compassion fatigue", "vicarious traumatization" and "secondary traumatic stress" are all terms used to describe the potential emotional impact that working with traumatized families such as fetal death, abortion, and maternal death (Pezaro, Clyne, & Fulton, 2017). These clinical events and/ or work environments are challenging intrapartum nurses to deal with emotional or response of job stress at labor or delivery unit. Moreover, intrapartum nurses may suffer from work-related psychological distress, physical, and post-traumatic stress disorder [PTSD] due to the fact of litigation and dealing with courts and criminal laws (Anderson, 2013; Peyman, Nayeri, Bandboni, & Moghadam, 2019).

In terms of physical job demands, intrapartum nurses regularly have to handle and lift patients (Van den Tooren & de Jonge, 2010). For example, transfer pregnant women to delivery room; place patients' legs into stirrups for delivery and adjust the height and angle of the stirrups; lean and stretch to examine patients vaginally or to find fetal heart tones. On top of that, intrapartum nurses also tend to work in awkward positions, stand in a prolonged period of time in emergency situations (Stichler, Feiler, & Chase, 2012). These high job demands lead to the potential for musculoskeletal injuries and stressful at work.

These are work environments that expose intrapartum nurses to encounter prolonged periods of job stress. Moreover, common causes of job stress among intrapartum nurses are negative working cultures, a lack of staff support, conflict with obstetrician, bullying, burnout, uncaring behaviors, compassion fatigue, and high staff turnover rate in the midwifery profession (Pezaro et al., 2017).

**Consequences of job stress among intrapartum nurses**

Job stress has far-reaching consequences, not only for the health and safety of workers but also for the organization. A person exposed to job stress show a whole range of emotional, cognitive, behavioral and physiological reactions to various harmful effects of work, organization, and working environment (Banovcinova & Baskova, 2014; Knezevic et al., 2011). Therefore, the consequences of job stress among intrapartum nurses can be considered into those at an individual level and those at an organizational-level (Beheshtifar, 2013; Karimyar Jahromi et al., 2015).

Individual-level consequences, nursing research firmly recognizes that excessive exposure to psychosocial stressors produces considerable job stress, resulting in psychological reactions to stress that include growing anxiety, difficulties with concentration, negative emotions, lack of attention, depression, fatigue, burnout syndrome, and frequent suicidal thoughts (Keykaleh et al., 2018; Maharaj et al., 2018). Job stress may affect significantly nurse's quality of life, and simultaneously reduce the quality of care and thus negative impact on patients (Park & Kim, 2013; Sarafis et al., 2016). Moreover, consequences on physical health by the evidence shown that a meta-analysis by Nixon et al. (2011) of 79 studies reporting cross-sectional and longitudinal relationships between physical symptoms and various job stressors was conducted. This study summarizes the findings regarding eight types of the individual symptom: backache, headache, eyestrain, sleep disturbance, dizziness, fatigue, appetite, and gastrointestinal problems. In an aspect of behavioral consequences are withdrawal and isolation at work and at home; increased number of accidents such sharp and needlestick injuries (Malhi, Akkadechnunt, & Sirakamon, 2016; Moayed, Mahmoudi, Ebadi, & Sharif Nia, 2016) greater consumption of cigarettes, alcohol, and coffee; irritability; aggressiveness; sexual dysfunction; low morale; and increased violence at work or at home (Knezevic et al., 2011).

Organizational-level consequences, in terms of the negative effects on hospital organizations, found that job stress among nurses has as a result loss of compassion for patients and increased incidences of practice errors and therefore is unfavorably associated with the quality of care (Keykaleh et al., 2018). The delivery of quality care is inextricably linked to the occupational safety and health of healthcare providers and therefore cannot be considered in isolation (Freshwater &

Cahill, 2010). For instance, when nurses encounter to job stress, this may lead to a deterioration in the quantity and quality of patient care (Nantsupawat et al., 2016). Job stress results in considerable costs to organizations in terms of absenteeism, attrition rate, injury claims, infection rates, errors in treating patients, reduced productivity, and health care resources (Dagget et al., 2016; Hassard et al., 2017). Moreover, job stress among nurses leads to a serious nursing shortage and a high turnover rate amongst nurses around the world (Alomani, 2016). This consequence is a vicious circle that impacts on nurse's profession, patient safety, and hospital organization.

## Job demand-control-support model [JCDS model]

### Overview of job demand-control-support model [JDCS model]

The job demands-control-support model [JDCS model] also called the job strain model, was developed by Karasek and Theorell (1990). This model is a well-known theoretical over the past several decades and has been accepted as a theoretical foundation for job stress with empirical studies more than other job stress theories (Griffin & Clarke, 2011). The model has helped explain the relationship between job characteristics and workers' psychological well-being. The main ideas of the model are highly demanding jobs, defined as workload, time pressure, and personal conflict and low levels of job control, defined as decision latitude or autonomy in one's job, and low job support, defined as coworker or supervisor support, most likely to lead to decrements in well-being, and increase stress (Besen, 2013). On the contrary, job control and job support mitigate (of buffer) the effects of high demands on these outcomes.

The initial model is Job demand-control model [JDC model], which identifies two crucial job aspects in the work characteristics namely "job demands" and 'job control' (Karasek, 1979). The JDC model hypothesized that a combination of high job demands and low job control will result in a strain that is detrimental for employee wellbeing. This hypothesis is also called the "strain hypothesis". Later, the extended version of this model adding a third work characteristic, namely "social support". Therefore, the JDCS model focuses on three dimensions of psychosocial working conditions: job demands, job control and social support (Karasek et al., 1998;

Karasek & Theorell, 1990). The JDCS has a similar hypothesis to the JDC called the "iso-strain hypothesis", in which it is predicted an employee who experiences high demands, low control, and low amounts of support would experience high levels of job stress, resulting in adverse psychological effects. On the other hand, job control and job support can buffer the potential negative effects of high demands on job stress that called the "buffer hypothesis" (Karasek & Theorell, 1990; Theorell & Karasek, 1996).

The theorist explained that job stress is undesirable stress-like reactions that occur to workers facing high psychological workload demands or pressures combined with low control or decision latitude in meeting those demands. According to the JDCS model, job demand is a factor that concerns all workers at their various occupational and professional levels. Karasek (1979) believes that when a person faces high job demands whether psychological or physical are high, the person experiences a condition of work overload.

On the other hand, having job control will help to decrease job stress. Because of job control is an important resource that workers utilized to create opportunities for arousal, learning, and generating the potential for job satisfaction and life fulfillment. Job demands that permit autonomy through high decision latitude can be mitigating the stressful effects of job demands (Forbes & Jermier, 2015). Therefore, Karasek (1979) posits that increased decision latitude moderates the negative impact of high job demand, especially establish high job control can be reducing or eliminating a prolonged job stress response. Besides, providing workers with job control helps to increase worker motivation and to improve workers' coping skills (Karasek, 1979; Karasek &Theorell, 1990).

For job support, supportive from supervisors is important for workers in the decision-making process. Supervisors play an important role in shaping employees' perceptions of their working environment and their sense of value to the organization (Batista-Taran & Reio, 2011). Moreover, the supervisor being helpful to the worker in getting the work done and creating a teamwork environment. In part of coworker's support which reflects coworkers' friendliness, helpfulness, interest, and competence. This model proposes that job support from supervisors and coworkers can mitigate the effects of high job demands and decrease job stress.

In summary, the JDCS model emphasizes the importance of three dimensions of psychosocial working conditions: job demands and the two job resources: job control and social support that display relationship to job stress which occurs due to high job demands, low control, and low job support. On the other hand, although, job demands serve to increase job stress but job control and job support will help to decrease job stress.

### The effect of job demands on job stress

Job demands have been developed as a key component of job stress in JDCS model (Karasek & Theorell, 1990). Job demands can be characterized in several categories and in a variety of different ways. In terms of JDCS model, job demands can be distinguished into two types: Psychological job demands are defined as tasks that require cognitive arousal, mental alertness, and mental work, such as problem-solving, information processing, and dealing with time pressures on the job to complete job demands. Physical job demands are defined as job-related tasks that require physical exertion such as lifting heavy loads, maintaining an awkward position for a prolonged period of time in order to accomplish a task, or maintenance of a rapid pace of activities (Karasek, 1979; Karasek & Theorell, 1990).

Principally, workers are willing to do their tasks and become confident when they can collaborate with their circumstances, they will not felt overwhelmed by their work. Job demands are really not entirely harmful, but they may become stressful if they demand an excessive effort to change something that fails to be successful or true (Yulianti, & Rohmawati, 2020). The individual faced with high job demands especially when under time pressure can lead to job stress. According to this concept, The effect of job demands not only has consequences on workers in the short but also the medium, and long term both individual and organization.

In the short term, high job demands can decrease the work-life balance and well-being. When workers confront time limits combined with high job demands, they need to put effort into psychological and physical energy to achieve their job. These reasons can lead to exhaustion, fatigue, and job stress (Viotti & Converso, 2016).

Intermediate-term, numerous studies have reported on heavy job demands affect job performance and job satisfaction due to work expectations and quality of

work imbalance their job demands (Adriaenssens, Hamelink, & Bogaert, 2017; Al-Homayan, Shamsudin, Subramaniam, & Islam, 2013; Bagheri Hossein Abadi et al., 2021). For example, being exposed to a job demand such as disproportionate expectations from patients may lead workers to feel unsatisfied because of the impossibility of establishing good relationships with such patients and of meeting their expectations (Viotti, & Converso, 2016).

In the long term, workers who suffer from excessive job demands an attempt to seeking strategies to change the poor situations by absenteeism, intention to leave, and reduce the nursing quality and lead to the nursing shortage phenomenon (Bagheri Hossein Abadi et al., 2021; Viotti, & Converso, 2016). Nevertheless, the obvious negative effect on a person is physical and psychological disruptions that as burnout and job stress

Numerous studies found that job demands is a positive predictor of job stress (Akbari, Akbari, Shakerian, & Mahaki, 2017; Bani-Hani, Hamdan-Mansour, Atiyeh, & Alslman, 2016). The study of Baba, Tourigny, Wang, Lituchy, and Monserrat (2013) conducted a cross-cultural study in order that investigated the effect of job demand, job control, and supervisory support on stress among nurses in China, Japan, Argentina, and the Caribbean by using the Job demand-control [JDC] and the Job demand-control-support [JDCS] models in the large sample among 550 Chinese nurses, 240 Japanese nurses, 304 Argentinean nurses, and 252 nurses from Trinidad and Tobago. The result showed that job demand is a positive predictor of job stress in China ($\beta = 0.31$, $p < .01$), Japan ($\beta = 0.34$, $p < .01$), Argentina ($\beta = 0.30$, $p < .01$), and the Caribbean ($\beta = 0.38$, $p < .01$).

Consistently with the cross-cultural study investigated the relationship between job demands and job stress of 27 doctors and 328 nurses from Norway and 111 doctors, and 136 nurses from India (Pal & Saksvik, 2008). JCQ questionnaires were used to measure job demands (Karasek, 1985) and job stress was measured by Cooper Stress Check (1981). The results revealed that job demands have a significant positive relationship with job stress among the Norwegian subjects ($r = .39$, $p < .01$) but not among Indian subjects ($r = -.01$, ns).

A recent study examined the effect of workload on job stress of 216 Ghanaian outpatient department nurses (Kokoroko & Sanda, 2019). Due to workload

is a part of job demands that in the form of physical job demands, the results reported that workload has a significant positive effect on job stress level ($\beta = .333$, $p < .01$), which, workload explained 18% of the variance in job stress.

In conclusion, the JDCS model can be used to explain the universal effect of job demands on job stress in cross-cultural and different contexts. Obviously, this highlights that job demands have a significant direct positive effect on job stress, such that when job demands increase, job stress increases as well. Moreover, job demands are important variables in understanding the relationship between job demands and job stress, including explaining the effect of job demands on job stress, as well as providing empirical evidence to support the theoretical main effect that job demands have a direct positive effect on job stress.

The effect of job control on job stress

Job control also called decision latitude that is a combination of skilled discretion and decision autonomy (Karasek & Theorell, 1990). "Skilled discretion" refers to the skill and creativity required to do one's job (Karasek et al., 1998). This means that the workers can be controlled over his or her tasks including job design, freedom, and discretion over work schedule, as well as the processes to follow when doing the work. "Decision autonomy" refers to organizationally mediated opportunities for workers to make decisions about their work (Karasek et al., 1998) which means the organization gives the opportunity for workers to participate in collaborative decision-making including the extent to which workers are able to make decisions and control his or her actions independently during occupational tasks (Bagheri et al., 2021). In short, job control signifies the ability of employees to participate and make decisions regarding work including using their skills and design the work by themselves. Moreover, job control also involves the employees' ability to organize their work and adopt their own initiatives (Del Pozo-Antunez, Ariza-Montes, Fernandez-Navarro, & Molina-Sanchez, 2018).

JDCS model, job control, or decision latitude has a direct and inverse relationship with job stress. Job stress warns that jobs with high demands and low autonomy generate more strain, as opposed to jobs with low demands and high control, where the level of strain would be small. In the nursing profession, nurses need autonomy for their activities such as independent interventions by nurses' means

that nurses do not need to get permission from authorities for performing patients' assessments and observations (Shohani, Rasouli, & Sahebi, 2018). Job control has a significant impact on nurses' job satisfaction and the quality of patient care (Al-Hamdan, Banerjee, & Manojilovich, 2018) and was linked to job stress when they perceive low control in their job.

A number of recent studies support the relationship between job control and job stress. Guo et al. (2016) explored the relationships among structural empowerment, job stress, and burnout of 1002 Chinese nurses. They discovered a strong correlation between structural empowerment, occupational stress, and burnout levels ($p < .05$). Moreover, hierarchical regression analysis and structural equation modeling analyses revealed that structural empowerment had a significant influence on job stressor and burn out ($\chi2/df = 2.29$, GFI = 0.945, CFI = 0.965, IFI = .966, RMSEA = .061, $p < .05$). From the study, it can be concluded that when staff nurses feel more empowered in their work, it leads to lower levels of job stress, which in turn strongly influences burnout. Empowerment can be construed as high decision latitude (job control) as it provides individuals with resources to cope with excessive work demands (Andrews & Kacmar, 2014).

Likewise, the study of Trousselard et al. (2016) surveyed stress among 200 French nurses working in emergency, anesthesiology, and intensive care units based on demand-control-support [JDCS] model and found that nurses from acute care units were located in the high-stress quadrant with a higher level of job demands and a lower level of control. Therefore, these findings supported the theoretical proposition that the effect of job demands on job stress can be mitigated by job control.

In summary, the highlighted role of high control (decision latitude) on job stress is usually observed as a key factor in reducing job stress. On the other hand, low decision latitude has mainly been a factor of stress for nurses. Therefore, this evidence can confirm a negative effect job control on job stress, as well as the theoretical premise that job control can buffer the effects of job demands on job stress.

The effect of job support on job stress

Job support is a new concept that has been added to the JDC model. The new model namely JDCS model. The original model [JDC model] focused on two components are job demands and job control (Karasek, 1979). Job demands, according to the model, cause job stress, which has a negative impact on worker wellbeing, but job control has a positive direct impact on wellbeing and can offset the negative impacts of job demands. Subsequent empirical studies have incorporated forms of job support (supervisory and co-worker) and find these can mitigate the effects of job demands on job stress (Karasek & Theorell, 1990). Therefore, several scholars recognize the importance of job support at work (Dawson, O'Brien, & Beehr, 2016; French, Dumani, Allen, & Shockley, 2018)

Job support or social support in the workplace, which broadly refers to all levels of helpful interaction available on the job from both supervisors and co-workers (Karasek & Theorell, 1990). In the nursing profession, supervisors and colleagues are often described as two important sources of job support (Vera et al., 2015) due to their support can build teamwork; enhance subordinates' job satisfaction and career satisfaction and lower turnover rate (Achour, 2014)  and enhance their professional growth and career development (Halbesleben & Rotondo, 2007). Supervisor support is an important work-related resource, it aids in the achievement of nurses' work goals and, it may buffer the pressure and job stress of nurses, which, leads to greater work engagement (Choo & Nasurdin, 2016). Job support from colleagues has an impact on the individual's perception of the feeling of teamwork and supportive emotional. Nurses with supportive colleagues have the perception that a workplace is a place where others support them, where they all exchange knowledge, and where they all have a lot of learning chances (Van der Heijden et al., 2009).

The findings in the literature suggested that social support influences stress in the work environment. Social support from supervisors and coworkers appears to be a crucial variable influencing employee satisfaction, coping, and well-being. In addition, the role of social support in moderating the impact of work stressors on job stress was also demonstrated, providing empirical support for the theoretical propositions. Yu et al. (2014) survey of 1144 hospital nurses in China investigated the relationship between occupational stress and social support. The Occupational Stress

Inventory [OSI-R] was applied to evaluate occupational stress. The findings showed that score of occupational stress had a significant negative correlation with score of social support ($r$ = -.25, $p$ <.01). Results suggested that better social support is a good way to reduce the occupational stress of nurses.

Another cross-sectional study (Kaewboonchoo et al., 2014) evaluated the intention of nurses working at hospitals and determine the relationship between job stress and intent to stay at work among 514 female nurses aged 21-58 years old, who had worked full time at least 1 year at the hospitals. This study was used in the Thai version of the job content questionnaire [JCQ], and intent to stay at work. The results indicated that only supervisor support has significantly correlated with nurses with high-strain jobs on intent to stay at work ($\beta$ = .273, $p$ < .05). Among nurses with high-strain jobs, supervisor support was found to be more important than coworker support. Based on the outcomes of this study, stress levels are reduced by supervisor and coworker support. Job support is an important buffer against the negative effects of job stress such as intent to leave work. Moreover, the findings of this study suggested that job support in the workplace is important and related to intent to stay at work in the profession of nursing.

Referring to the JCDS model, this study identifies job support for intrapartum nurses as the job resources and social capital from colleagues and supervisors that are the major mechanisms to reduce job stress. Despite the high demands of the job, additional support in all aspects of support, whether it is information support, instrument support, or empowerment from supervisors and colleagues, can help to alleviate job stress. Therefore, for intrapartum nurses who encounter excess job demands and difficulties in their jobs, job support must be higher in order to contribute to lower levels of job stress, including promoting career paths and adding more ability to their job control. When an individual's perception of feeling safe in the workplace, gaining actual help from supervisors and colleagues, being supportive of resources, obtaining accurate information via others, understanding, and attention from and supervisors and colleagues, can be decreased job stress. Therefore, it can be conclude that the job support had a negative effect on job stress among interpartum nurses.

**The effect of job support on job control and job stress.**

According to the JDCS model, indicated that social support at work refers to support from both supervisors and co-workers. Job control refers to decision latitude that is job autonomy and skill discretion. Both dimensions are as the benefit of job resources of employees to against job stress. When examining the causal model of job stress, one should be mindful of the different dimensions of job stress. As hypothesized by Karasek and Theorell (1990) that job control and job support are a simple 'more is better' mechanism to drive well-being at work. Therefore, job control and job support are resources that complement one other excellently for reducing job stress.

Based on the JDCS model, job support refers to support from supervisors and support from colleagues. With respect to job support from supervisors, numerous scholars found the role of supervisors support is highlighted as important to elicit skill utilization, job empowerment, career development, and future advancement opportunities (Batista-Taran & Reio, 2011; Yang et al., 2018; Zaki, 2017) along with demonstrating its usefulness at improving the authority over decisions of workers (Theorell et al., 2014).

Moreover, supervisors have also an effect on employees' mental and physical health due to the control they have on the work environment, job duties, and deadlines (Batista-Taran & Reio, 2011; Leiter, Gascón, & Martínez-Jarreta, 2010) and able to influence their employees in the decision-making process to cope with the new demands. In particular, supervisor support is considered beneficial for employee stress reduction as an external resource that enhances career outcomes, recognition, and merit pay, as well as essential resources of health and well-being at work, and it should be recognized as a major component in workplace health promotion (Hämmig, 2017; Shanock & Eisenberger, 2006). Hence, job support from supervisors is a key construct of employees to improved job control and decrease job stress when employees confront excess job demands.

The job support from colleagues influences job control that mitigates job stress. The relationships of employees tend to establish long-term social exchanges with their coworkers in order to encourage collaboration ties and emotional support among them (Albort-Morant, Ariza-Montes, Leal-Rodríguez, & Giorgi, 2020)

that can reduce job stress. Another study confirmed intricate associations between job support and the broader dimension of job control such as job performance, training, learning, and skill utilization (Park, Kang, & Kim, 2018).

In conclusion, job support is the path of promoting job control and contributes to easing the worker's regulation and promotion of learning and skill utilization and reducing, in turn, the impact of job demands on job stress. Therefore, job support has a positive effect on job control, which when combined together can mitigate job stress.

## Summary the effects of job demands, job control, and job support on job stress

This chapter mainly discusses the review of empirical evidence. This study considers perceptions of job stress among intrapartum nurses and tests the causal relationship model between job demands, job control, and job support on job stress among intrapartum nurses. A theoretical framework for the study is job demands-control-support model [JDCS model] (Karasek & Theorell, 1990) used as a guideline for the understanding of job stress at work among intrapartum nurses. The literature review of the JDCS model and job stress provides empirical evidence for the theoretical propositions and links to the effect of job stress through the hypothesized model. Job demands are in the form of physical and psychological demands that lead to job stress when job demands are higher than the ability and time to achieve their job which is indicated a positive relationship between job demands and job stress. Job control is an internal resource of workers that help to improve skills and permit workers to control and design own their job. The theorists concur that workers with a high level of job control, according to the theories, can enhance their performance, job satisfaction and decrease job stress. On the other hand, lacking job control leads to job stress. Job support is a key factor that affects job stress. The source of job support in this study is support from supervisors and colleagues that is the social capital. Job support is a direct and inverse effect on job stress that depends on the quantity of job support. Job control and job support act the similar role that moderating the impact of

job demands on job stress was also demonstrated, providing empirical support for the theoretical propositions.

This study was expanding knowledge about the relationship between job demands, job control, and job support on job stress among intrapartum nurses. Some evidence can inform nurses administrators, policymakers at any level to support intrapartum nurses in balancing their work engagement and reduced job stress. Furthermore, such knowledge was beneficial in designing measures to improve the health-care environment for nurses and preserve nurses in the profession.

# CHAPTER 3
# RESEARCH METHODOLOGY

This chapter addresses the research methodology that includes research design, population and sample, setting of the study, research instruments, protection of human rights, data collection procedures, and data analyses.

## Research design

A cross-sectional, correlational design with Structural equation modeling [SEM] was used to test the hypothesized model of job stress among intrapartum nurses. This research design was appropriate in testing the accuracy of the hypothesized causal model and could test the direct and indirect effects among the variables in order to understand the complex phenomenon (Gray, Grove, & Sutherland, 2017).

## Population and sample

### Population

The target population in this study was intrapartum nurses working at labor room of 28 regional hospitals under the jurisdiction of the Ministry of Public Health, Thailand.

### Sample

The sample was recruited from the target population who met the following inclusion criteria:

1. Being registered nurses [RNs] who have been working at the labor room for at least six months.

2. Not taking role of the head nurse of the unit.

### Sample size

According to SEM, the sample size plays an important role in the estimation and interpretation of SEM results (Hair, Black, Babin, Anderson, & Tatham, 2006). Principally, researchers suggest relatively large sample sizes (N > 200) for SEM. In order to maintain the power of the test and to obtain stable parameter estimates and

standard errors, Schumacker and Lomax (2010) suggested that the sample size is between 250 and 500 study participants for SEM. To minimize any problem with multivariate normality in estimated in the model, there are suggestions that the minimum sample size is a ratio of at least five respondents per estimated parameter or a ratio of 10-15 respondents per parameter considered most appropriate (Hair, Black, Babin, & Anderson, 2010; Kline, 2015). Based on their suggestion, the appropriate sample size could range from 240 to 360 participants for the 24 estimated parameters (13 errors, 5-factor loadings, and 6 path coefficients). Consequently, a total sample size of 282 participants was recruited for this study.

### Setting of the study

The regional hospitals under the jurisdiction of the Ministry of Public Health, Thailand consist of 28 regional hospitals. There are located in provincial capitals. There are having a capacity of at least 500 beds and a comprehensive set of specialists on staff or specialty hospitals. These hospital organizations are a complex structure, severe and complicated patients, and high technology for investigating. Therefore, patients and relatives expect the best possible treatment from the staff and also expected to provide high-quality nursing care.

Intrapartum nurses serve a critical role in preparing women for labor and safe delivery. Major responsibilities comprise assisting with care and monitoring during labor and birth includes notifying high-risk during labor to obstetricians as well as providing postnatal care up to a specific time. In the case of high-risk and complicated pregnancies, the care of pregnant women at risk is based on the close collaboration between intrapartum nurses and obstetricians. Intrapartum nurses have a duty to assist with care, monitor, and administering drugs on high-risk pregnancies under the treatment of obstetricians. Furthermore, they performed emergency procedures and consulted other medical staff such as obstetricians and pediatricians where necessary include writing reports and documenting assessments and care.

Intrapartum nurses who work in these hospitals must encounter emotionally and physically intense. Therefore, intrapartum nurses are prone to job stress include expectations from mothers and relatives. For this reason, the study focused on registered nurses as intrapartum nurses who work in these hospitals.

**Sampling**

A multistage random sampling technique was used to obtain the sample from the 28 regional hospitals under the jurisdiction of the Ministry of Public Health.

Step 1: These 28 regional hospitals were divided into four cluster regions in Thailand: Northern region (6 hospitals), Central region (9 hospitals), North Eastern region (7 hospitals), and Southern region (6 hospitals).

Step 2: Four hospitals were randomly selected from each region, a total of 16 regional hospitals. The Northern region hospitals: Sawanpracharak hospital, Lampang hospital, Uttaradit hospital, and Chiangrai Prachanukroh Hospital. The North-Eastern region hospitals: Udon Thani hospital, Buriram hospital, Sakon Nakhon Hospital, and Surin Hospital. The Central region hospitals: Chonburi hospital, Rayong hospital, Nakhon Pathom hospital, and Prapokklao hospital. The Southern region hospitals: Hatyai hospital, Surat Thani hospital, Maharaj Nakhon Si Thammarat hospital, and Yala hospital.

Step 3: At each randomly selected hospital, the eligible participants who were willing to participate in the study were recruited.  Finally, a total of 282 participants were recruited through the inclusion criteria. The process of multistage sampling was presented in Figure 2 as follows.
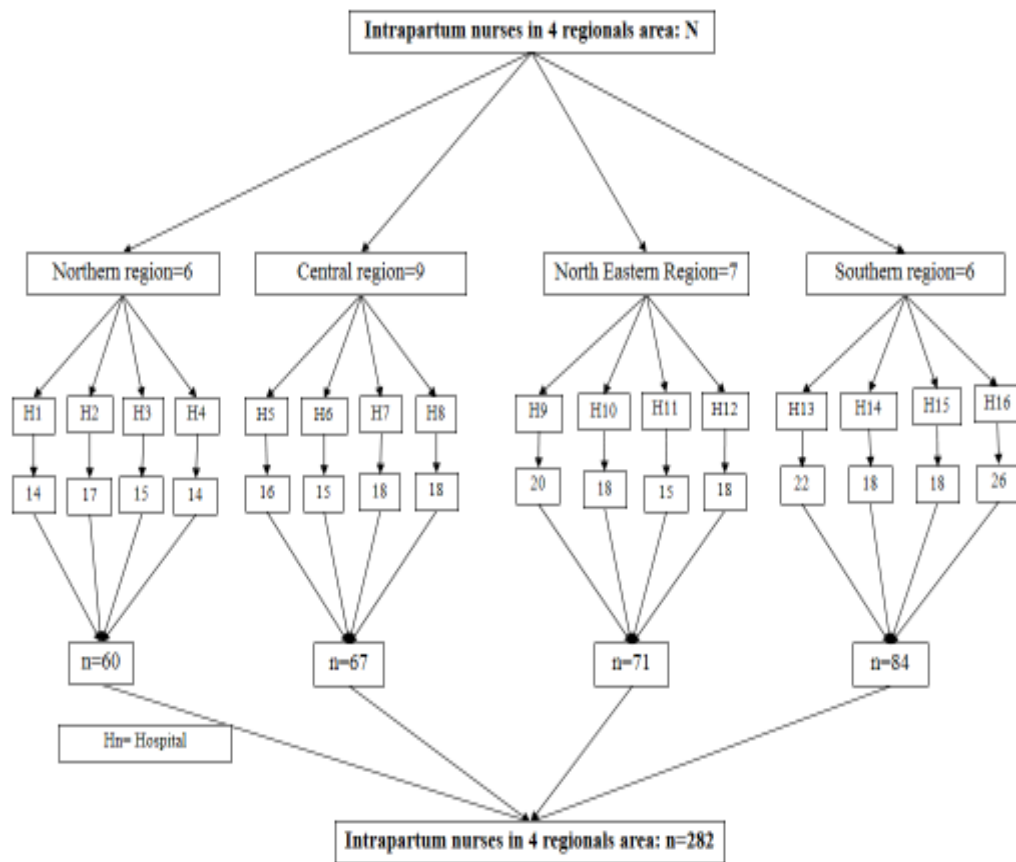
Figure 2 Multistage random sampling technique of this study

## Research instruments

The research instruments included three self-report questionnaires which used to measure the dependent variable and all independent variables, and a demographic record form. The detail of all research instruments was described below.

**A demographic record from**

This form record personal information regarding age, marital status, having children, education, work experience as intrapartum nurse, shift work, frequency of shift work per month, frequency of clients or childbirth per month, knowledge and skills training in the past year, and monthly income.

**The Thai version of the job content questionnaire [TJCQ]**

The Thai version of the job content questionnaire [TJCQ] which developed and validated by Phakthongsuk (2009). The TJCQ was developed from the 48-item

version of the JCQ that is based on the job demand-control-support [JDCS] model. The JCQ has been the most popular self-administered instrument. The JCQ is composed of three major components that describe job demand, job control or decision latitude, and social support from work (Karasek, et al., 1998; Karasek & Theorell, 1990). The JCQ has also been translated into several countries in Europe, America, and Japan. Moreover, the instrument could be applied to use internationally in different occupations and cultures such as Thailand (Phakthongsuk, 2009; Phakthongsuk & Apakupakul, 2008).

The TJCQ was translated into Thai and then back-translated into English by a bilingual speaker who was unaware of the original English version. Two items from the original JCQ were deleted and based on in-depth interviews and eight additional items were added to the Thai version in order to modify the JCQ to the Thai context. The validity and reliability of the final TJCQ were assessed by using exploratory and confirmatory factor analysis which conducted with samples of 10,415 Thai workers in over 100 occupations including Thai professional nurses. In terms of reliability was generally acceptable. Cronbach's alpha with internal consistency for the subscales ranging from .71 to .86 (Phakthongsuk, 2009).

The TJCQ was used to measure three major study variables as follows:

1. Job demands scale consists of four subscales 35 items that describe psychological job demand (12 items), physical job demand (6 items), hazards at work (12 items), and job security (5 items). Job demands scale in the TJCQ is one of the standard questionnaires to measure psychosocial work factors. Moreover, it has widely used in numerous occupations, including public health occupation samples. Several studies reported good psychometric properties including reliability for the scale with a coefficient ranging from .75 to .89 (Pengjam, 2016; Thangthum, Kalampakorn, & Lagampan, 2014).

In this study, all of the participants obtained nurses' public sector positions that are the role of job security. As a general rule, this holds true: job loss rates are lower in the public sector than in the private sector (The NHWDS, 2015; Dissakul & Sorakraikitikul, 2018). Job security is not considered as one of the observed variables and was deleted five items. An example question was deleted; "In the past year, how often have you been faced with a situation related to unemployment/ having no work/

being layoff?", "In the next two years, how likely are you to be laid off from your current work and employer?".

Therefore, Job demands are a total of three subscales 30 items: psychological job demand (12 items), physical job demand (6 items), and hazard at work (12 items). Each item has a response set of four-point Likert scales that range from 1 or strongly disagree to 4 or strongly agree, except hazard at work subscale a 3-point Likert scale, ranging from 1 (No problem) to 3 (Severe problem). The score of a negative statement was reversed before summing. The possible range of scores is 30 to 108 in which a higher score meaning indicates a higher level of Job demands. Finally, 30 items of Job demands were analyzed the SEM analysis and the Cronbach's alpha of the Job demands in this study was .83. A confirmatory approach was analyzed, measurement models of Job demands scale.

2. Job control or decision latitude scale in the TJCQ was used to measure the variety of skills and level of creativity required in the performance of the job (Hackman & Lawler, 1971) and decision autonomy of working employees to control. There are two dimensions: skill discretion 6 items and decision autonomy 5 items, a total of 11 items. For each item, the answer was recorded on a 4-point Likert scale, ranging from 1 or strongly disagree to 4 or strongly agree. The sum of two subscales was summed for the final score. The possible range of scores is 4 to 44 in which a higher score meaning indicates a higher level of Job control. Job control scale in the TJCQ demonstrated good reliability across studies involving different occupations was ranging from .81 to .84 (Jirapongsuwan et al., 2011; Phakthongsuk, 2009; Thangthum et al., 2014). The Cronbach's alpha obtained for the current study was .84. A confirmatory approach was analyzed, measurement models of Job control scale.

3. Job support scale in the TJCQ was designed to measure the various types of task assistance for coping with work-related problems that they received from colleagues and supervisors. It comprised of two dimensions including supervisor support contains 4 items and colleague support contains 4 items, a total of 8 items. The items were completed by the participants and rated on a 4-point Likert scale ranging from 1or strongly disagree to 4 or strongly agree. The sum of two subscales are the total score of job support. The possible range of scores is 8 to 32. A higher score meaning indicates a higher level of social support at work. Job support scale in

TJCQ was used in numerous studies especially for the participants who are nurses and staff who work in the hospital in Thailand. The instrument was reported as well-validated and reliable with internal consistency for the subscales ranging from .81 to .89 (Kaewboonchoo et al., 2014; Thangthum et al., 2014). In this study, all items of Job support scale were analyzed by a confirmatory approach in order to validate the construct validity and the Cronbach's alpha of Job support scale was .89.

        **The job stress scale**

        Job stress was assessed by the Job Stress Scale. The Job Stress Scale was developed by Parker & Decotiis (1983) in order to measure the level of stresses particular from the job. The Job Stress Scale comprised of two-component 13 items; time pressure closely describes feelings of being under time pressure and psychological distress indicating that job-related feelings of distress. The instrument demonstrated high psychometric properties including reliability for the scale with a coefficient ranging from .74 to .89 that examined across different occupations and cultures (Addae & Wang, 2006; Glazer & Kruse, 2008; Hsieh, 2004; Jamal, 2007; Parker & DeCotiis, 1983). Especially, the reliability of the instrument for nurses who work in a Canadian hospital was reported with a Cronbach's alpha of .84 (Jamal & Baba, 2000).

        The original English version of The Job Stress Scale was translated into a Thai version by Jampong (2016). It is a summative Likert scale that measures overall job stress using a five-point scale ranging from strongly disagree (1) to strongly agree (5). The scale scores can range from 13-65 with higher scores indicating higher levels of job stress. The reliability coefficients reported by Jampong (2016) were .94. In this study, this instrument was completed by the intrapartum nurses and rated on a 5-point Likert scale as above which reported The Cronbach's alpha of The Job Stress Scale-Thai version was .91. However, a confirmatory approach was used to test the measurement models of the Job Stress Scale.

## Psychometric properties of the measures

        **Validity**

        All of the instruments have been validated the content validity in previous studies and also have been evaluated in Thai samples. In addition, all of the Thai-

version instruments have been translated into Thai by using the back-translation technique and have been administrated in Thai. Therefore, in this study, they are not required to validate its content validity again. However, in this study, the construct validity of each questionnaire was tested by using confirmatory factor analysis (CFA), which was carried out under the AMOS program to estimate the appropriate measurement model.

**Reliability**

The reliability of all instruments in this study was tested for internal consistency. Principally, a Cronbach's alpha of .80 and over is considered an acceptable value for a well-developed psychosocial measurement instrument (Burns & Grove, 2009; Polit & Beck, 2012). A pilot study was conducted to test the reliability of instruments with 30 intrapartum nurses who met the same inclusion criteria at two regional hospitals which were not the study hospitals: Phra Nakhon Si Ayutthaya Hospital and Saraburi hospital. The results indicated that all of these instruments were good reliability. A Cronbach's alpha values for these instruments were as shown in Table 1.

Table 1 The summary of reliability of the instruments in this study

| Variables | Instruments | Source | Items | Reliability (Cronbach's Alpha) |
|---|---|---|---|---|
| Job stress | The job stress scale | Parker and DeCotiis (1983) and Thai version by Jampong (2016) | 13 | .91 |
| Job demands | Thai version of the | Phakthongsuk (2009) | 30 | .83 |
| Job control | job content | | 11 | .84 |
| Job support | questionnaire [TJCQ] | | 8 | .89 |

## Protection of human subjects

Prior to data collection, the ethical approval of research was granted by the Institutional Review Board [IRB], Burapha University (Code number of the IRB approval G-HS 003/2563), and also approved by the institutional review board of each regional hospital, a total of 16 regional hospitals: Sawanpracharak hospital (Code number of the IRB approval 58/2563), Lampang hospital (Code number of the IRB approval 76/63), Uttaradit hospital (Code number of the IRB approval 22/2020), Chiangrai Prachanukroh Hospital (Code number of the IRB approval CR 0032.102/EC), Udon Thani hospital (Code number of the IRB approval 004/2563), Buriram hospital (Referral by document Approval Record 0032.102.1/38), Sakon Nakhon Hospital (Code number of the IRB approval SKHREC27/2563), Surin Hospital (Code number of the IRB approval 34/2563), Chonburi hospital (Code number of the IRB approval 105/2563), Rayong hospital (RYH REC No.E029/2563), Nakhon Pathom hospital (Code number of the IRB approval 023/2020), Prapokklao hospital (Code number of the IRB approval CTIREC 040/63), Hatyai hospital (Code number of the IRB approval 82/2563), Surat Thani hospital (Code number of the IRB approval 56/2563), Maharaj Nakhon Si Thammarat hospital (Code number of the IRB approval 46/2563), and Yala hospital (Code number of the IRB approval 16/2563).

All of the participants who volunteered to participate were informed about the research objectives and methods. They were also informed that they had the right to refuse to participate in the study or withdraw from the study at any time if they wish without any effect on their work or promoting the position. Questionnaires were completed by intrapartum nurses during their private time which no more than minimal risks were anticipated in answering the questions. In addition, the presentation of the findings maintained the confidentiality of individual responses and destroyed after the publication of the research project.

## Data collection procedures

After this study approved by the Institutional Review Board [IRB], Burapha University (Code number of the IRB approval G-HS 003/2563), and 16 regional

hospitals research ethics committees. Details of the data collection procedures were conducted as follows:

      1. After the research permission had been granted. The researcher contacted the nurse directors at all of the selected hospitals in order to seek support for data collection.

      2. Head nurses of the labor room in all of the hospitals were informed about the objectives of the study by the researcher. The total number of intrapartum nurses of each hospital who met the inclusion criteria was obtained from the head nurse of the labor.

      3. One intrapartum nurse has been requested to be a research coordinator from each hospital for helping with the data collection procedure. Then, the researcher explained the whole process of data collection to the research coordinator, including examining the number of questionnaires before sending the package of questionnaires to return to the researcher.

      4. The package of questionnaires consists of an information sheet, informed consent forms, questionnaires, and a return envelope that explained the objective of the study, the method for assurance of confidentiality and anonymity, and the time frame for completion of the questionnaires was distributed to the participants by research coordinators. The potential participants were requested to cooperate in completing the questionnaires in their private time.

      5. The participants were requested to return the completed questionnaires in the envelope provided and returned the questionnaires to the research coordinator within the next two weeks.

      6. The researcher received all questionnaires from the research coordinators and checked the completeness of questionnaires on each page before analyzing the data.

## Data analyses

      The data were analyzed and test assumption by a statistical software program. The level of significance was set at .05. The researcher confirmed data in order to the accuracy of the data entry, missing data, outliers of each variable, and test statistical assumptions. The details were summarized as follows:

1. Descriptive statistics were used to analyze in order to describe the demographic characteristics of the samples and all study variables, including means, standard deviation, frequencies, percentage, range, and distribution of the variables.

2. Assumptions of Structural Equation Model [SEM] were assessed including univariate outliers, a normal distribution, multivariate normality, multicollinearity, and homoscedasticity.

3. The measurement model of latent variables were conducted by confirmatory factor analysis [CFA] for construct validity by using the AMOS program.

4. Structural equation modeling [SEM], AMOS software application was conducted to test the hypothesized model of job stress among intrapartum nurses and examined the magnitude of causal effects, both direct, and indirect effects among the relationships of the study variables in the model.

# CHAPTER 4
# RESULTS

This chapter presents the research findings of the study. The results of the dissertation research are represented in four sections. The first section describes the characteristics of the participants. The second section presents the result of multivariate analysis statistical assumptions testing for the structural equation modeling. The third section describes description of the study variables, including job demands, job control, job support, and job stress. The final section explains the Principle analysis: testing of the hypothesized model and research hypotheses of job stress among intrapartum nurses.

## The participants' characteristics

The participants of this study were conducted using a multi-stage random sampling technique to obtain the samples from the 16 regional hospitals under the jurisdiction of the Ministry of Public Health, Thailand. The initial sample was 282 subjects who met the inclusion criteria and agreed to participate in the study. For non-returned questionnaires, six packages cannot be returned because those participants are on maternity leave and vacation days. Therefore, the total samples in this study were originally 276. However, after testing for the assumptions underlying structural equation modeling analysis including missing data, outliers, univariate, and multivariate normality, 4 subjects were identified as a statistical abnormality. They were eliminated from further analysis. Consequently, there were a total of 272 subjects for data analysis. The demographic characteristics of the participants were presented in Table 2.

All of the participants were female (100%) and their ages ranged from 23 to 60 years old with the mean of 36.8 ($SD = 10.14$). Approximately half of the participants were married (50.7 %), and most of them have no child (59.6 %). As to their education, most of the participants have graduated at the bachelor's degree level (94.1 %). The participants' work experience ranged from 1 to 36 years with the mean of 12.9 ($SD = 9.7$). The largest group of participants' work experience as intrapartum

nurses were not more than ten years (54.8 %). The majority of the participants had monthly incomes of more than 30,001 Baht per month (47.8 %).

Considering the work condition, most of the participants worked duties as rotating shift (Days/ evening/ night shift) (89.7 %). The majority of the participants' work shifts ranged from 20 to 40 shifts with the mean of 25.64 ($SD$ = 4.86) and more than half of them work on duties as shift 20-25 per month (63.3 %), while 27.9 % was group 31-35 per month. The number of clients and childbirth ranged from 200 to 700 cases per month with a mean of 412.89 ($SD$ = 110.84). Approximately 301 to 400 cases per month of clients and childbirth were taken care of by the participants (37.5 %) which was followed by 401 to 500 (33.1 %), and 200 to 300 (22.8 %). In the past year, the majority of participants have been supported to participate in a conference in order to develop skills in midwifery, maternal and child, or related to the job more than ten hours per year (65.8 %), while 34.2 % of them participated in a conference less than ten hours per year.

Table 2 The demographic characteristic of the participants ($n$ = 272)

| Characteristic | $n$ | % |
|---|---|---|
| Age (years) (Mean = 36.8, $SD$ = 10.14, min = 23, max = 60) | | |
| ≤ 30 years | 112 | 41.2 |
| 31 - 40 years | 55 | 20.2 |
| 41 - 50 years | 70 | 25.7 |
| 51 - 60 years | 35 | 12.9 |
| Marital status | | |
| Single | 119 | 43.8 |
| Married | 138 | 50.7 |
| Widowed/ divorce/ separate | 15 | 5.5 |
| Having children | | |
| No child | 162 | 59.6 |
| Having children | 110 | 40.4 |

Table 2 (Continued)

| Characteristic | *n* | % |
|---|---|---|
| Education | | |
| Bachelor degree | 257 | 94.5 |
| Master degree | 15 | 5.5 |
| Work experience (Mean = 12.89, *SD* = 9.70, min = 1, max = 36) | | |
| ≤ 10 years | 149 | 54.8 |
| 11 - 20 years | 57 | 21.0 |
| 21 - 30 years | 48 | 17.6 |
| ≥ 31 years | 18 | 6.6 |
| Shift work | | |
| Day shift only | 28 | 10.3 |
| Rotating shift | 244 | 89.7 |
| Number of shift per month (Mean = 25.64, *SD* = 4.86, min = 20, max = 40) | | |
| 20 - 25 | 172 | 63.3 |
| 26 - 30 | 16 | 5.9 |
| 31 - 35 | 76 | 27.9 |
| > 36 | 8 | 2.9 |
| Number of childbirth per month (Mean = 412.89, *SD* = 110.84, min = 200, max = 700) | | |
| 200 - 300 cases | 62 | 22.8 |
| 301 - 400 cases | 102 | 37.5 |
| 401 - 500 cases | 90 | 33.1 |
| > 501 cases | 18 | 6.6 |
| Knowledge and skills training in the past year | | |
| ≤ 10 hours per year | 93 | 34.2 |
| > 10 hours per year | 179 | 65.8 |

Table 2 (Continued)

| Characteristic | *n* | % |
|---|---|---|
| Monthly income | | |
| ≤ 20,000 baht | 35 | 12.9 |
| 20,001 - 25,000 baht | 35 | 12.9 |
| 25,001 - 30,000 baht | 72 | 26.5 |
| > 30,001 baht | 130 | 47.8 |

Assumption testing for the structural equation model [SEM]

Structural Equation Modeling [SEM] is a family of a multivariate statistical analysis technique. This technique is used to analyze the relationship between the measurement model and the structural model based upon the assumptions supported by the theory (Kumar et al., 2016). Prior to conducting the SEM model, the first important thing is testing statistical assumptions regarding multivariate analysis for the SEM. These procedures are significant to reduce bias and prevent potential distortion and also improve facilitate the estimation process or result from the interpretation result (Hair, Black, Babin, & Anderson, 2019; Schumacker & Lomax, 2010; Tabachnick & Fidell, 2007).

Set of assumptions testing of SEM is based on multivariate analysis assumptions includes outlier, normality of distribution, linearity, and multicollinearity (Schumacker & Lowmax, 2010; Tabachnic & Fidell, 2007). The testing of assumption for SEM was described as follow:

First, the data was cleaned and checked from the original total sample of 276. Revealed that there were no missing data. Subsequently, a total of 276 was used to perform the assumption testing and further statistical analysis.

Second, identifying a statistical outlier that can distort and leads to Type I error and/ or Type II error includes interpret the biased result. In this study, two forms of statistical outliers were examined, namely: univariate outliers and multivariate outliers. Univariate outliers were examined from each variable that consists of extreme values on one variable by using standardized scores. Tabachnick & Fidell

(2013) suggest that standardized scores are outside the absolute value of 3.29 standard deviation, considered univariate outliers. In line with this threshold, it was found that there were four univariate outliers (case 22, 82, 217, and 259 in table Appendix E-1).

Furthermore, to ensure that outliers have not been violated, multivariate outliers were also detected using Mahalanobis distance. Mahalanobis distance refers to the distance of a case from the centroid of the means of all variables and assessed by using the chi-squared distribution, in which a case of chi-squared $\leq .001$ is considered to multivariate outliers (Tabachnick & Fidell, 2013). The results for the assessment of multivariate outliers are presented two multivariate outliers were detected (case 82 and 217 in table Appendix E-2). Hence, it eliminated four cases that are univariate outliers and multivariate outliers from raw data. The final dataset used for the main analyses was 272.

In the next step, the normal distribution of the data was assessed. Hair et al. (2019) pointed out that the normal distribution is the fundamental assumption for statistical analysis and structural equation model. Hair et al. (2019), normality refers to the shape of the distribution of data for individual metric variable and its correspondence to the normal distribution of the benchmark for statistical methods.

To ensure that the overall distribution of the data corresponds to normality. In this study, a statistical method of skewness and kurtosis to assess the normal distribution of data was applied. Hair et al. (2019) and Tabachnick & Fidell (2013) indicate that the normal distribution is values of skewness and kurtosis are equal to zero and the critical ratios are between the absolute value of 1.96. The finding revealed that only three variables met the criteria of normality distribution, including job demand (skewness .101/ .144 = .701; kurtosis -.100/ .287 = -.348), job control (skewness .032/ .144 = .222; kurtosis .178/ .287 = -.620), and job stress (skewness .162/ .144 = 1.125; kurtosis -.412/ .287 = -1.435). The other one variable, which was job support (skewness .065/ .144 = .222; kurtosis 1.050/ .287 = 3.658) did not meet the criteria.

However, Tabachnick and Fidell (2013) suggested that a large sample of 200 and more can be reduced the impact of non-normal distribution because deviations from the normality of skewness and kurtosis often do not make a significant difference in the analysis. Whilst, the absolute value of skewness greater than three

and kurtosis value greater than ten may indicate a problem, and values above 20 may indicate a more serious problem (Hair et al., 2019; Kline, 2011). According to this recommendation, the absolute values of the skewness and kurtosis should not be greater than three and ten. Hence, the absolute values of the skewness and kurtosis of all the variables in this study are within the acceptable range of < 3 and < 10 respectively. It can be concluded that the normality assumption of this study was detected.

The linearity assumption has to test for SEM also in order to indicate the degree of the linear relationship between two variables. To preserve the linearity assumption, the Pearson Product Moment correlation coefficient was used to assessed (Schumacker & Lomax, 2010; Tabachnick & Fidell, 2007). The examination found that a linear correlation coefficient is a non-zero correlation. Therefore, evidence of linearity assumption was found in this.

Lastly, the multicollinearity assumption is also important to investigate intercorrelations among variables. There are three central criteria for assessed multicollinearity: Pearson's correlation coefficients between variables, variance inflation factors [VIF], and tolerance values. To measure multicollinearity, if a correlation matrix occurs when variables are too highly correlated ($r \geq .90$), the VIF value exceeding 4.0, or by tolerance less than .2 then there is a problem with multicollinearity (Hair et al., 2019). The results indicated that Correlation coefficients between the predictors ranged from -.200 to .863 as shown in Table 3. Whilst, VIF values ranged from 1.15 to 1.89, and tolerance values ranged from .53 to .87. Consequently, no evidence of multicollinearity was found among the study variables.

In summary, testing of assumptions for conducting SEM in this study did not violate.

Table 3 Correlation matrix of nine study variables (*n* = 272)

| | Psycho demand | Physical demand | Hazard at work | Skill discretion | Decision autonomy | Supervisors | Colleagues | Time pressure | Distress |
|---|---|---|---|---|---|---|---|---|---|
| Psycho demand | 1 | | | | | | | | |
| Physical demand | .385** | 1 | | | | | | | |
| Hazard | .274** | .409** | 1 | | | | | | |
| Skill discretion | .066 | .105 | .205** | 1 | | | | | |
| Decision autonomy | -.200** | -.019 | -.044 | .527** | 1 | | | | |
| Supervisors | .179** | .168** | .105 | .409** | .258** | 1 | | | |
| Colleagues | -.013 | .054 | .148* | .422** | .330** | .521** | 1 | | |
| Time pressure | .474** | .409** | .400** | .220** | .022 | .212** | .113 | 1 | |
| Distress | .458** | .391** | .356** | .255** | .026 | .201** | .189** | .863** | 1 |

* $p < .05$, ** $p < .01$

Notes: 1) Job demand: Physical demand, Psycho demand & hazard, 2) Job control: Skill discretion & decision autonomy, 3)
Job support: Supervisors & colleagues, 4) Job stress: Time pressure & distress

### Description of the major study variables

Descriptive statistics of the responses to the instruments used to measure the four major variables: Job demands, Job control, Job support, and Job stress in this study were analyzed and described below.

**Job demands:** The scores of average job demands with the actual range between 38 and 106, with a mean of 70.58 ($SD = 8.08$). According to a reported source of job demands showed that psychological job demand with the actual range between 19 and 47, with a mean of 35.40 ($SD = 3.72$) which at a high level.

**Job control:** It was reported job control with the actual range between 22 and 44, with a mean of 33.78 ($SD = 3.81$). To consider a total mean scores of job control and each dimension of job control found that is at a good level as well (skill discretion with a mean of 13.20, $SD = 1.62$, and decision autonomy with a mean of 20.58, $SD = 2.61$).

**Job support:** Total mean scores of job support was 24.28 ($SD = 3.26$), with the actual range between 11 and 32. According to a report found that job support and each dimension of job support are at a good level as well. It considered job support as favorable in this study.

**Job stress:** Intrapartum nurses reported a total mean scores of job stress was 35.59 ($SD = 9.98$), with the actual range between 13 and 62. It considered the total mean scores of job stress is moderate.

The results of statistical description of the major study variables are provided in Table 4.

Table 4 Descriptive statistics of major study variables ($n = 272$)

| Variables | Range | | Mean | SD |
|---|---|---|---|---|
| | Potential | Actual | | |
| Job demands | 30-108 | 38-106 | 70.58 | 8.08 |
| Psychological job demand | 12-48 | 19-47 | 35.40 | 3.72 |
| Physical job demand | 6-24 | 7-23 | 15.13 | 2.70 |
| Hazard at work | 12-36 | 12-36 | 20.05 | 4.20 |
| Job control | 11-44 | 22-44 | 33.78 | 3.81 |
| Skill discretion | 4-16 | 8-16 | 13.20 | 1.62 |
| Decision autonomy | 7-28 | 14-28 | 20.58 | 2.61 |
| Job support | 8-32 | 11-32 | 24.28 | 3.26 |
| Supervisor support | 4-16 | 4-16 | 11.98 | 2.16 |
| Colleagues support | 4-16 | 7-16 | 12.30 | 1.67 |
| Job stress | 13-65 | 13-62 | 35.59 | 9.98 |
| Time pressure | 8-40 | 8-37 | 22.56 | 6.26 |
| Distress | 5-25 | 5-25 | 13.03 | 4.45 |

## Principle analysis

Structural equation modeling [SEM] is a set of multivariate statistical analysis techniques, which applied the technique of factor analysis and multiple regression analysis. SEM seeks to explain relationships among multiple variables or relationships between measured variables and latent constructs that composed of the measurement model and the structural model (Schumacker & Lomax, 2010) in order to demonstrate the hypothesized model is supported by empirical evidence and theoretical model.

In this study, the AMOS program was used to SEM analysis based on maximum likelihood [ML] to estimate parameters that composed of two types of

model: measurement model assessment and structural model assessment (Schumacher & Lomax, 2010).

### Measurement model assessment

Measurement model is the first of the two-stage approach recommended for an SEM analysis that described the latent variable and its indicators that specify the rules of correspondence between measured and latent variables (Hair et al., 2019). This step assesses the conformity of data and the measures as well as purify measures so that estimation of the structural regression model is reliable and valid. The confirmatory factor analysis [CFA] is a key analysis of measurement model assessment. Moreover, the CFA method also verifies the reliability and validity of a latent construct.

Principally, the CFA determined factor loadings of each variable into a latent variable. Hair et al. (2019) and Chin (1998) suggest that loading should be at least .5, loading higher than .6 is applicable, and ideally .7 or higher. Variables with high factor loading affirm that manifest variables are strongly related to their associated constructs and are one indication of construct validity. On the other hand, variables with factor loading less than those numbers are suggested to be dropped to increase the construct validity. In this study, any variables with a factor loading less than or close to .5 were investigated. The researcher relied mainly on face validity and descriptive statistics to consider whether variables with low loading scores should be kept or not. Besides dropping variables, Byrne (2010) suggested that modification indices [Mis] could be employed to solve the factor loading and error terms which AMOS provides modification indices to suggest such modifications.

In addition to considering factor loadings of variables, the measurement model also examined the goodness of fit [GOF] of the model in order to assess for judging the soundness modification. This study used the GOF indices for the refinement of the measurement model and initial hypothesized model to improve the fit to its recommended levels as follows:

The overall fit model applies the likelihood ratio chi-square statistic ($\chi^2$) (Byrne, 2010; Hair et al., 2019; Kline, 2011). The $\chi^2$ GOF test would provide an insignificant result at a .05 threshold that is suggested that the model fit with the

observed data (Barrett, 2007). Nevertheless, the χ2 GOF test value depended on sample size and the model complexity. Hair et al. (2019) suggested that no matter what the χ2 result, the researcher should always complement it with other GOF indices include considering the model degree of freedom (df) also influences the χ2. Therefore, except for a p-value of more than .05, the ratio of χ2/*df* < 3 is recommended for SEM (Hair et al., 2019; Kline, 2011), and a ratio of χ2/df < 2 is recommended for CFA (Wu, 2012).

The goodness-of-fit index [GFI] represents the overall degree of fit but is not adjusted for the degrees of freedom (Byrne, 2010; Hair al., 2019). While adjusted goodness-of-fit index [AGFI] adjust GFI. Values of GFI and AGFI greater than .9 can be accepted for this research where .95 indicating a good fit (Hair et al., 2019; Schumacher & Lomax, 2010).

Root mean square error of approximation [RMSEA]: the value should be ≤ .05 (Hair et al., 2019; Schumacher & Lomax, 2010).

Comparative fit index [CFI] represents a comparison between the estimated model and a null or independent model. The value range from 0 to 1.0 and larger values indicate higher levels of goodness-of-fit. In this study, values of CFI greater than .9 can be accepted and greater than .95 indicating a good fit (Hair et al., 2019; Schumacher & Lomax, 2010). Evaluating the goodness-of-fit criteria is summarized in Table 5.

Table 5 Summarized goodness-of-fit criteria

| Goodness-of-fit | Indices | Abbreviation | Level of acceptable fit |
|---|---|---|---|
| 1. Absolute fit and model parsimony | Chi-square | $\chi^2$ | p > .05 |
| 2. Absolute fit measures | Normed chi-square | $\chi^2/df$ | < 3.00 |
| | Root mean square error of approximation | RMSEA | ≤ 0.05 |
| | Goodness-of-fit index | GFI | > .90 |
| | adjusted goodness-of-fit index | AGFI | |
| 3. Incremental fit measures | Comparative fit index | CFI | > .90 |

According to those criteria, in this study, all four constructs: job demands, job control, job support, and job stress were investigated the measurement model by using the CFA. The details were presented below.

**Job demands**

Job demands construct comprise three subscales in this study: psychological job demand, physical job demand, and hazard at work. The CFA of job demands employed a second-order confirmatory factor analysis method, where each dimension is applied a general CFA or first-order confirmatory factor analysis, then the total score representing each dimension or sub-construct was treated as a variable for higher-order CFA.

To consider the standardized factor loadings of each construct of job demands shown that the range of the standardized factor loadings of psychological job demands is -.07 to .74. The standardized factor loadings of physical job demand ranged from .28 to .80. Then, the standardized factor loadings of hazards at work ranged from -.36 to .63. The goodness-of-fit parameters indicates that $\chi^2$ = 937.717,

*df* = 404, CMIN/ *df* = 2.321, GFI = .804, AGFI = .775, CFI = .715, and
RMSEA = .070. In this case, the loading score of variables that less than .5 needs an
investigation. Whilst, the measurement model of job demands does not well fit with
the empirical data as follows the Figure 3.



Figure 3 Measurement model of Job demands

To achieve the criteria for model goodness of fit, the measurement model of
job demands needs to modify. Model revisions were done based on assessments of
factor loadings and modification indices [Mis] while maintaining the congenericity of
the measurement model within the theoretical framework. In this study, items with
factor loadings less than .5 were considered for removal and MIs values were only

used to identify potential cross-loading items (Hair et al., 2019). However, the researcher considers relied mainly on face validity to judge whether variables with low loading scores should be kept or not.

To obtain a good-fitting model, Job demands were revised iteratively as described below.

Initially, 18 items (psychological job demands: M1, M2, M3, M7, M8, M9, M10, M11, and M12; physical job demand: w13, w14, and w15; hazards at work: Hz19, Hz21, Hz22, Hz23, Hz28, and Hz29) with factor loadings of less than .5 were removed from the model. Therefore, the measurement model of job demands was modified by considering the MIs value until achieving the criteria for model goodness of fit. The CFA results and the modification of the model shown that $\chi^2 = 76.013$, $df = 51$, CMIN/ $df = 1.490$, GFI = .956, AGFI = .933, CFI = .804, and RMSEA = .043. (Figure 4)
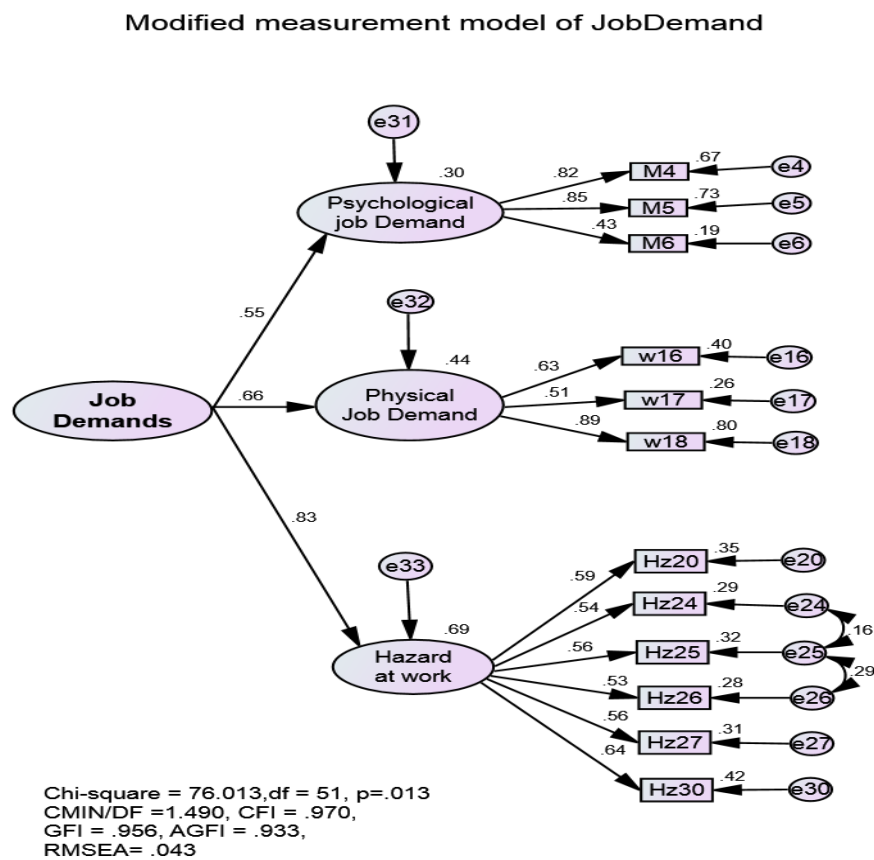


Figure 4 Modified measurement model of Job demands

**Job control**

Job control construct comprises two subscales in this study: skill discretion and decision autonomy. The CFA of job control employed a second-order confirmatory factor analysis method, where each dimension is applied a general CFA or first-order confirmatory factor analysis, then the total score representing each dimension or sub-construct was treated as a variable for higher-order CFA.

To consider the standardized factor loadings of each construct of job control shown that the range of the standardized factor loadings of skill discretion is .58 to .74 and the standardized factor loadings of decision autonomy ranged from .27 to .74. The goodness-of-fit parameters indicates that $\chi^2 = 149.994$, $df = 43$, CMIN/ $df = 3.488$, GFI = .917, AGFI = .872, CFI = .899, and RMSEA = .093. In this case, the loading score of variables that less than .5 needs an investigation. Whilst the measurement model of job control does not well fit with the empirical data is presented the Figures 5.



Chi-square = 149.994 , df = 43, p=.000
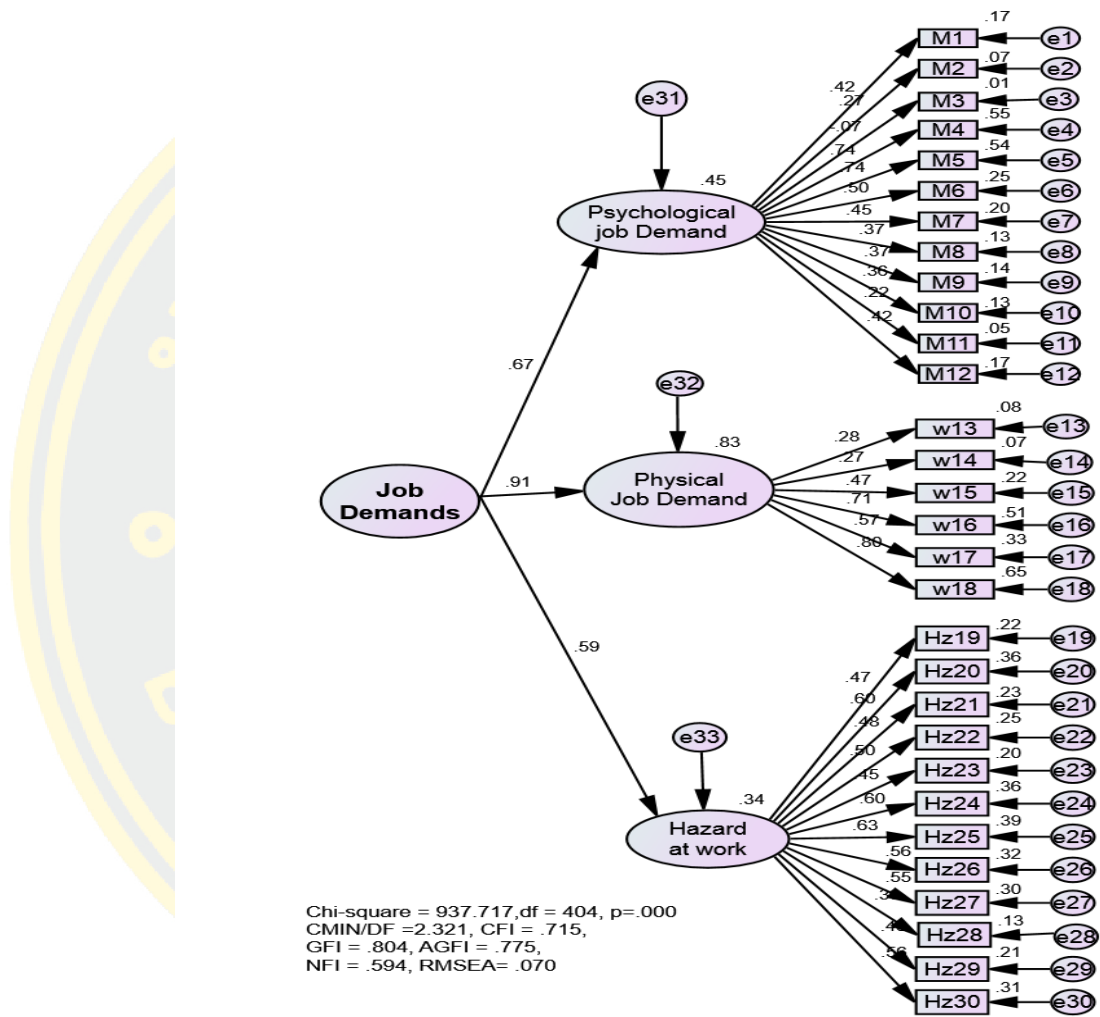CMIN/DF =3.488, GFI = .917,
AGFI = .872, CFI = .899,
RMSEA= .093

Figure 5 Measurement model of job control

To achieve the criteria for model goodness of fit, the measurement model of job control needs to modify. Model revisions were done based on assessments of factor loadings and MIs while maintaining the congenericity of the measurement model within the theoretical framework. In this study, items with factor loadings less than .5 were considered for removal and MIs values were only used to identify potential cross-loading items (Hair et al., 2010). However, the researcher considers relied mainly on face validity to judge whether variables with low loading scores should be kept or not.

To obtain a good-fitting model, Job control was revised iteratively as described below.

Initially, one item (C39) with factor loadings of less than .5 was removed from the decision autonomy construct. Moreover, Byrne (2010) recommended re-specify measurement models by fitting them with the data to gain more accurate estimation. Therefore, variables with factor loading less than .6 are considered to be dropped to increase the construct validity. According to the recommendation, this was followed by the removal of an additional two items (C38 and C40) from the decision autonomy construct with factor loadings of less than .6, and the face validity of the measures is not sounded to keep. Whilst, one item (C36: factor loading = .58) from the skill discretion was retained because the face validity of the measures is sounded to keep this variable since the perception of participants should reflect the real setting.

However, by considering its importance, face validity of the measures, and contribution of the variables towards the estimation, the job control construct was revised iteratively until achieving the criteria for model goodness of fit. The CFA results and the modification of the model shown that $\chi^2 = 23.586$, $df = 15$, $p = .072$, CMIN/ $df = 1.572$, GFI = .980, AGFI = .953, CFI = .989, and RMSEA = .045 (Figure 6).

Modified measurement model of job control



Chi-square = 23.586 , df = 15, p=.072
CMIN/DF =1.572, GFI = .980,
AGFI = .953, CFI = .989,
RMSEA= .045
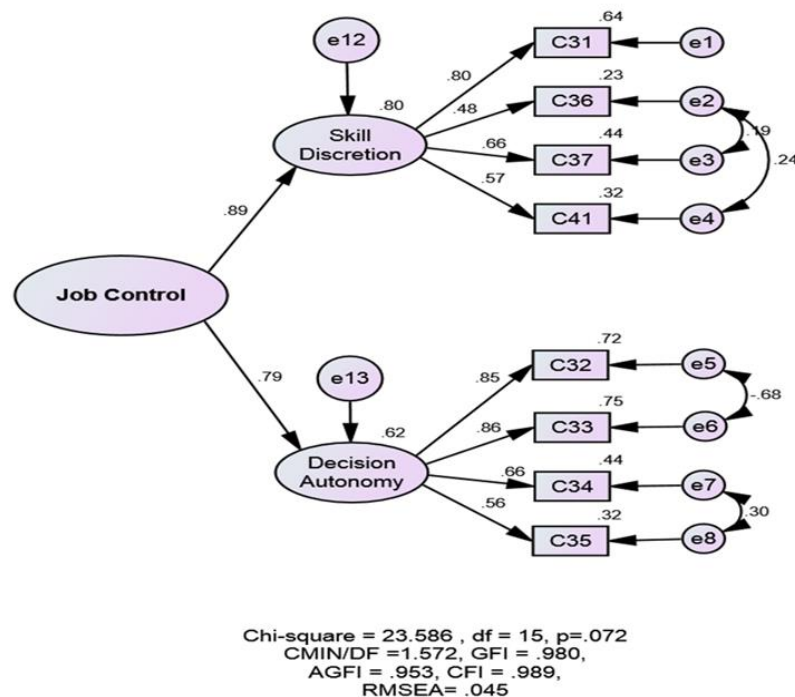
Figure 6 Modified measurement model of job control

**Job support**

Job support construct comprises two subscales in this study: supervisor support and colleague support. The CFA of job support employed a second-order confirmatory factor analysis method, where each dimension is applied a general CFA or first-order confirmatory factor analysis, then the total score representing each dimension or sub-construct was treated as a variable for higher-order CFA.

To consider the standardized factor loadings of all construct of job support shown that the range of the standardized factor loadings is .71 to .88. In this case, the loading score of variables higher than .6 was accepted (Miller, 1995). The goodness-of-fit parameters indicates that $\chi^2 = 46.805$, $df = 19$, CMIN/$df = 2.463$, GFI = .964, AGFI = .931, CFI = .979, and RMSEA = .072. The measurement model of job support as follows the figure 7.
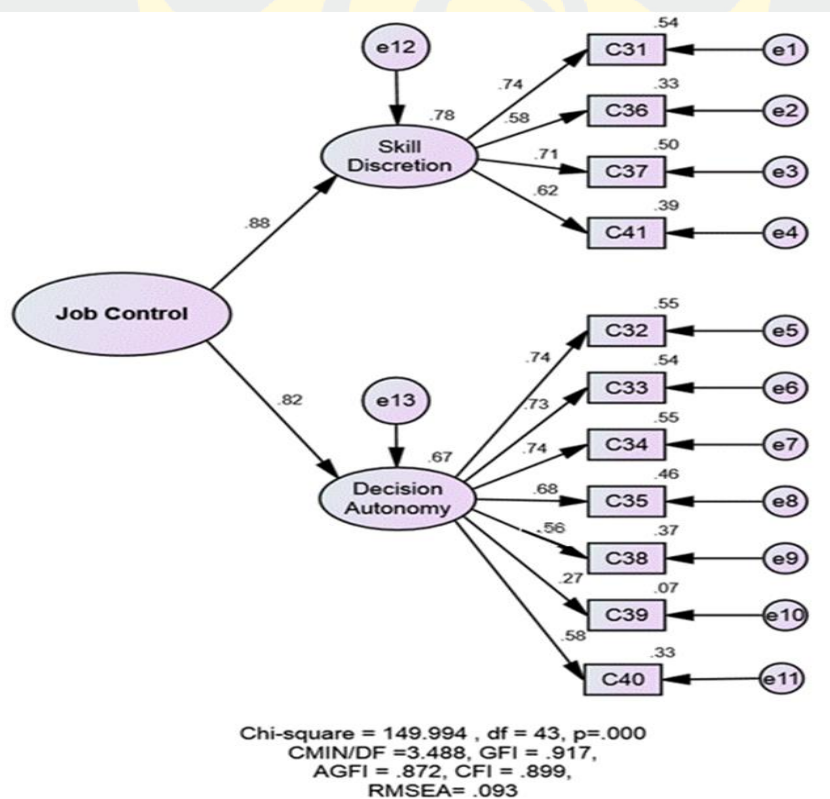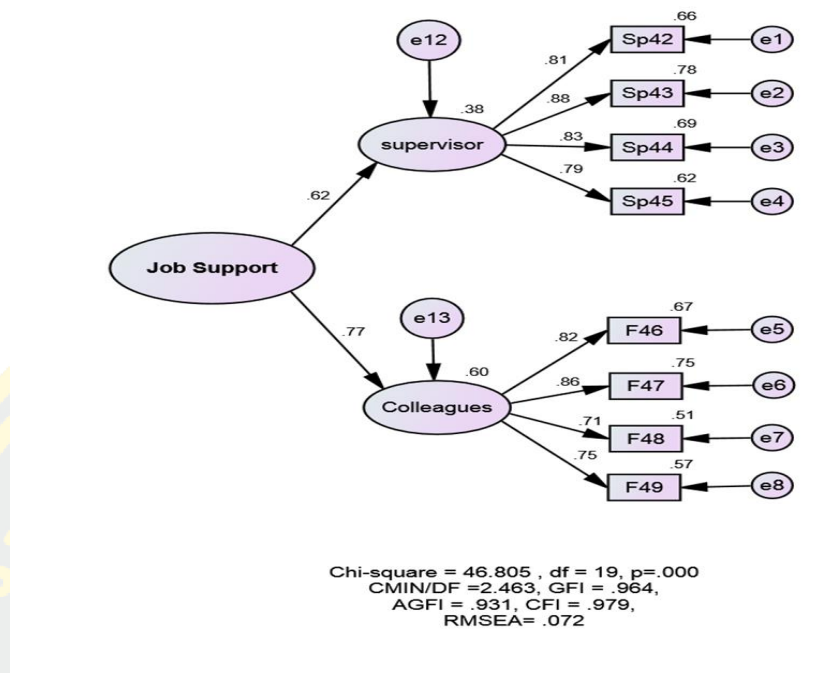
Figure 7 Measurement model of Job support

To achieve the criteria for model goodness of fit, the measurement model of job support needs to modify. It is recommended to re-specify measurement models by fitting them with the data to gain more accurate estimation (Byrne, 2010). Therefore, model revisions were done based on assessments of MIs until achieving the criteria for model goodness of fit. The CFA results and the modification of the model shown that $\chi^2$ = 26.117, *df* = 17, CMIN/ *df* =1.536, GFI = .978, AGFI = .953, CFI = .993, and RMSEA = .043 (Figure 8).

Modified measurement model of job support
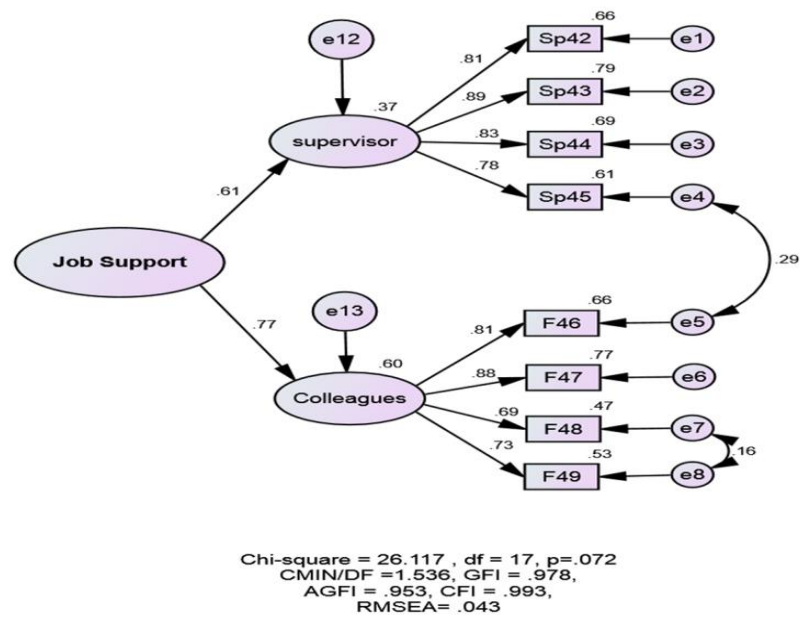


Figure 8 Modified measurement model of job support

**Job stress**

Job stress construct comprises two subscales in this study: time pressure and psychological distress. The CFA of job stress employed a second-order confirmatory factor analysis method, where each dimension is applied a general CFA or first-order confirmatory factor analysis, then the total score representing each dimension or sub-construct was treated as a variable for higher-order CFA.

To consider the standardized factor loadings of each construct of job control shown that the range of the standardized factor loadings of time pressure is .45 to .87 and the standardized factor loadings of psychological distress ranged from .30 to .79. The goodness-of-fit parameters indicates that $\chi^2$ = 244.488, $df$ = 64, CMIN/ $df$ = 3.820, GFI = .881, AGFI = .831, CFI = .904, and RMSEA = .099. In this case, the loading score of variables that less than .5 needs an investigation. Whilst the measurement model of job stress does not well fit with the empirical data is presented the Figures 9.
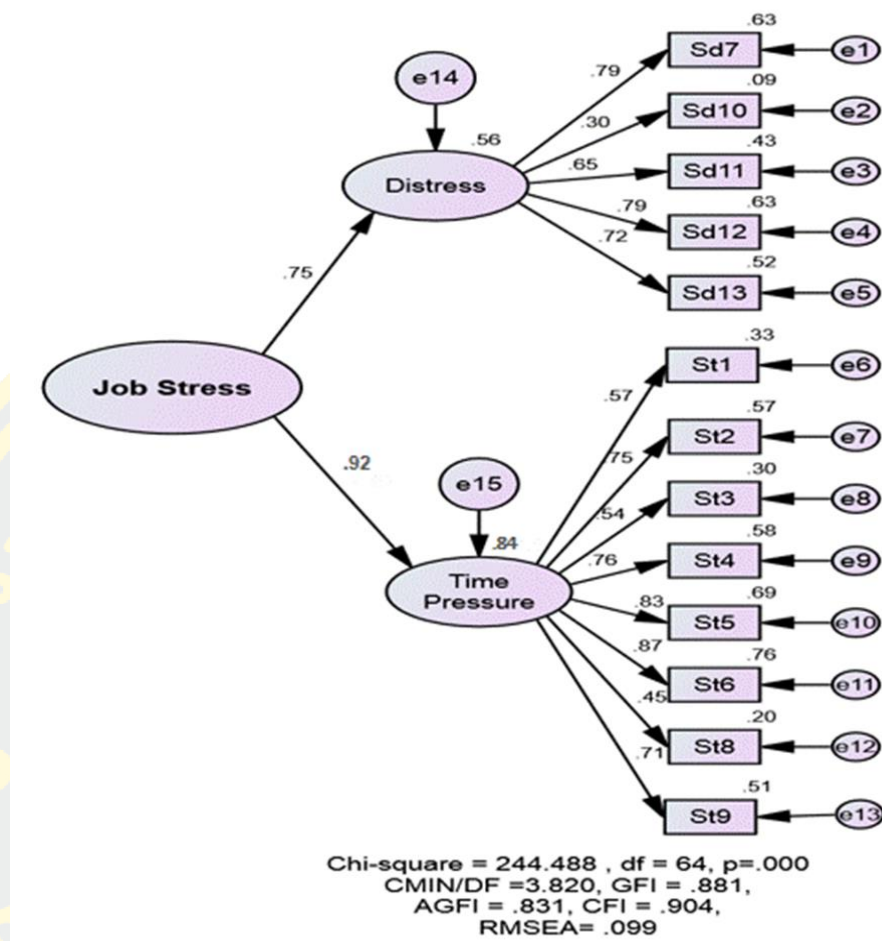
Figure 9 Measurement model of job stress

To achieve the criteria for model goodness of fit, the measurement model of job stress needs to modify. Model revisions were done based on assessments of factor loadings and MIs while maintaining the congenericity of the measurement model within the theoretical framework. In this study, items with factor loadings less than .5 were considered for removal and MIs values were only used to identify potential cross-loading items (Hair et al., 2019). However, the researcher considers relied mainly on face validity to judge whether variables with low loading scores should be kept or not.

To obtain a good-fitting model, Job stress was revised iteratively as described below.

Initially, two items (Sd10 and St8) with factor loadings of less than .5 were removed from the latent variables. Byrne (2010) recommended re-specify measurement models by fitting them with the data to gain more accurate estimation. Therefore, variables with factor loading less than .6 are considered to be dropped to increase the construct validity. According to the recommendation, this was followed by the removal of an additional two items (St1 and St3) from the time pressure latent variable with factor loadings of less than .6.

However, by considering its importance, face validity of the measures, and contribution of the variables towards the estimation, the job stress construct was revised iteratively until achieving the criteria for model goodness of fit. The CFA results and the modification of the model shown that $\chi^2 = 36.358$, $df = 22$, CMIN/ $df = 1.653$, GFI = .972, AGFI = .944, CFI = .991, and RMSEA = .048 (Figure 10).
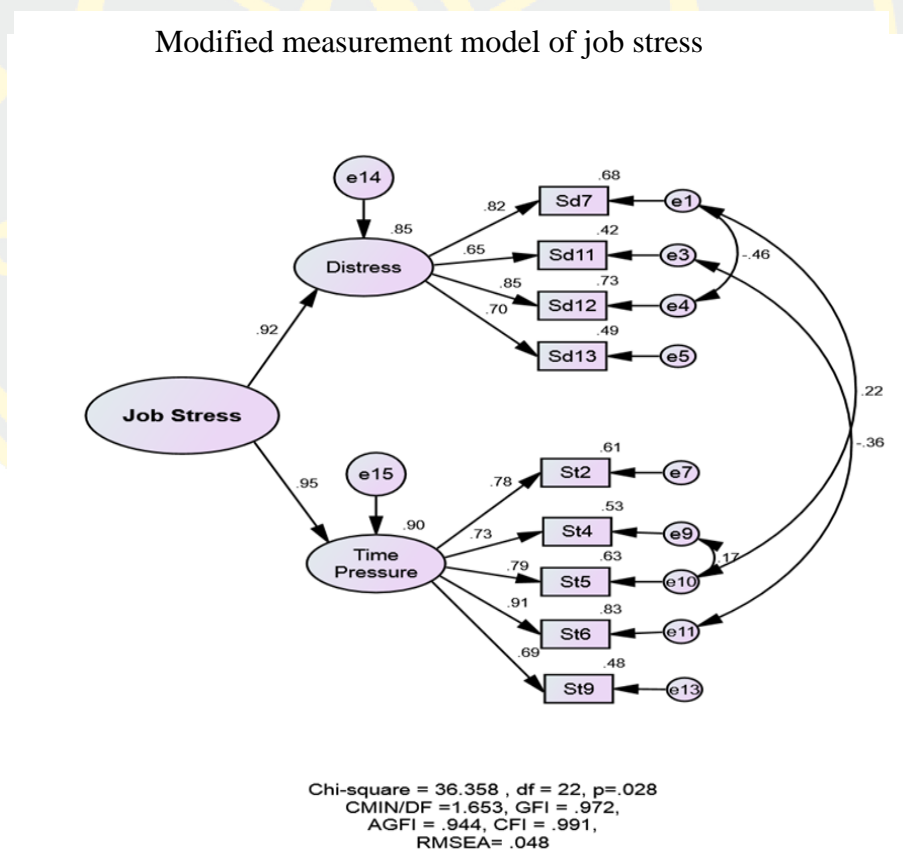


Figure 10 Modified measurement model of job stress

The summarized Goodness-of-fit Criteria of the measurement model and modified measurement model of all latent variables are shown in Table 6. The modified measurement model of all latent variables was applied to analyses structural model assessment, all variables are well-loaded into their respected constructs.

Table 6 Summary of evaluation of measurement models with goodness-of-fit measures between originals and the final modified models

| Construct variables | Goodness-of-fit criteria | | Goodness of fit statistics | | Model achieve criteria |
| | | | Measurement model | Modified measurement model | |
|---|---|---|---|---|---|
| Job demands | chi-square ($\chi^2$) | | 937.717 | 76.013 | |
| | df | | 404 | 51 | |
| | $\chi^2$/df | < 3 | 2.321 | 1.490 | Superior fit |
| | GFI | > 0.90 | .804 | .956 | Superior fit |
| | AGFI | > 0.90 | .775 | .933 | Good fit |
| | CFI | ≥ 0.90 | .715 | .970 | Superior fit |
| | RMSEA | ≤ 0.05 | .070 | .043 | Superior fit |
| Job control | chi-square ($\chi^2$) | | 149.994 | 23.586 | |
| | df | | 43 | 15 | |
| | $\chi^2$/df | < 3 | 3.488 | 1.572 | Superior fit |
| | GFI | > 0.90 | .917 | .980 | Superior fit |
| | AGFI | > 0.90 | .872 | .953 | Superior fit |
| | CFI | ≥ 0.90 | .899 | .989 | Superior fit |
| | RMSEA | ≤ 0.05 | .093 | .045 | Superior fit |

Table 6 (Continued)

| Construct variables | Goodness-of-fit criteria | Goodness of fit statistics | | Model achieve criteria |
| | | Measurement model | Modified measurement model | |
|---|---|---|---|---|
| Job support | chi-square ($\chi^2$) | 46.805 | 26.117 | |
| | df | 19 | 17 | |
| | $\chi^2$/df | < 3 | 2.463 | 1.536 | Superior fit |
| | GFI | > 0.90 | .964 | .978 | Superior fit |
| | AGFI | > 0.90 | .931 | .953 | Superior fit |
| | CFI | ≥ 0.90 | .979 | .993 | Superior fit |
| | RMSEA | ≤ 0.05 | .072 | .043 | Superior fit |
| Job stress | chi-square ($\chi^2$) | 244.488 | 36.358 | |
| | df | 64 | 22 | |
| | $\chi^2$/df | < 3 | 3.820 | 1.653 | Superior fit |
| | GFI | > 0.90 | .881 | .972 | Superior fit |
| | AGFI | > 0.90 | .831 | .944 | Good fit |
| | CFI | ≥ 0.90 | .904 | .991 | Superior fit |
| | RMSEA | ≤ 0.05 | .099 | .048 | Superior fit |

## Structural model assessment

In the previous step, structural equation modeling [SEM] based on CFA was employed to test a measurement model fit and estimate constructs' content. The structural model testing was the second step that should be determined after the measurement model testing. There were two steps including assessing the structural model fit and validating parameter estimates against the research hypotheses. In this step, structural equation modeling procedures were applied to assess the hypothesized structural model, in developing a fitting model; then a suitable model was used for testing research hypotheses.

**The hypothesized model testing**

The hypothesized model consisted of Job demands as one exogenous latent variable. Job control and job support were a mediator between the exogenous variables and job stress was the endogenous latent variable. According to the measures of overall model fit index, the results of the hypothesized model showed that CMIN = 57.70, $df$ = 21, CMIN/$df$ = 2.74, GFI = .96, AGFI = .91, CFI = .95, and RMSEA = .08. The model explained 68% of the total variance.

The series of the hypothesized model was illustrated by a path diagram and presented the relationships between constructs as arrows. Each arrow in the model represents direct relationships between observed exogenous variables and observed endogenous variables, and between observed endogenous variables. In this study, the path diagram of the hypothesized model of the effects of job demands, job control, and job support on job stress among intrapartum nurses was tested by using parameter estimates and presented in the table and the figure. The analyzed path diagram of the hypothesized model indicated that parameter estimates and directions were significant at a probability level of less than .05.

The relationships between exogenous and mediators, the results showed that the positive direction was a path from job demands to job support ($\beta$ = .23, $p$ < .05). Whilst, the negative direction was a path from job demands to job control ($\beta$ = -.21, $p$ < .05).

The relationships between exogenous and endogenous variables, there were significant relationships of parameter estimates between a path from job demands to job stress ($\beta$ = .81, $p$ < .001).

The relationships between observed endogenous variables, there were a significant relationship of parameter estimates between a path from a path of job support to job control ($\beta$ = .69, $p$ < .001) and a path from job control to job stress ($\beta$ = .25, $p$ < .01). Whilst, the parameter estimates from job support to job stress was found no significant relationship ($\beta$ = .04, $p$ = .795).

According to the result of the hypothesized model testing, although the GOF values of the hypothesized model are accepted. Nevertheless, the parameter estimates

from job support to job stress were found no significant relationship. Therefore, the hypothesized model should be modified (Figure 11).
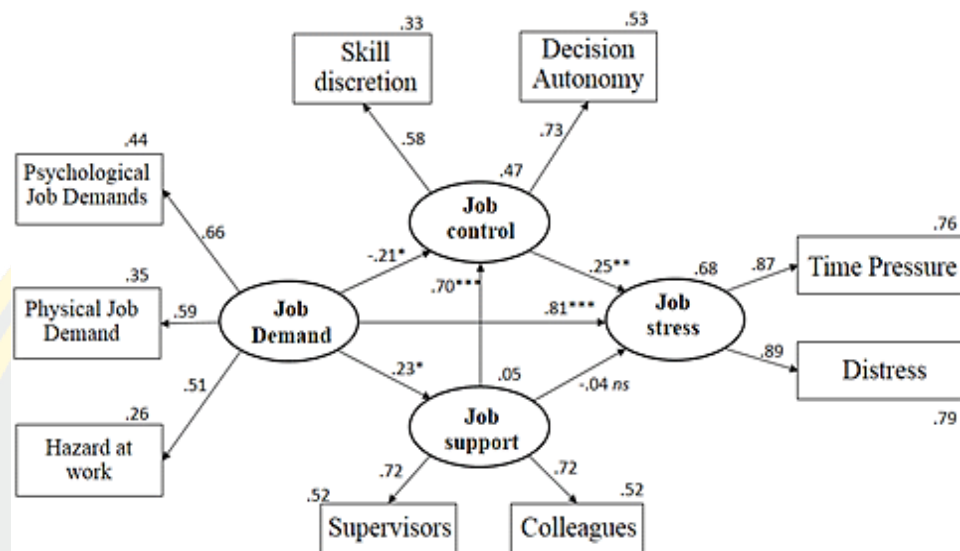


$\chi 2 = 57.70$, df = 21, CMIN/df = 2.74, GFI = .96, AGFI = .91, CFI = .95, and RMSEA = .08, ns = non-significant, $*p < .05$, $**p < .01$, $***p < .001$

Figure 11 The hypothesized model of the effects of job demands, job control, and job support on job stress among intrapartum nurses

**The model modification**

The model modification [MI] was used to improve model fit. Modification indices were used in the process of the model modification (Blunch, 2013; Schumacker & Lomax, 2010). The model trimming was used by deleting the only parameters estimate with non-significant paths in the hypothesized model. The parameter estimate from job support to job stress was deleted from the model. Consequently, the hypothesized model was modified until the model accomplished significantly goodness-of-fit (Kline, 2011).

Finally, the result of the model accomplished significantly goodness-of-fit coefficients and specified parameters as shown in Figure 12. The overall model fit indexes of the modified model denoted that CMIN = 57.76, $df = 22$, CMIN/ $df = 2.62$, GFI = .96, AGFI = .91, CFI = .95, and RMSEA = .07. Therefore, the modified model

had a validation index of adequacy of the model at acceptable levels. The model explained 67% of the total variance in job stress.

The relationships between exogenous and endogenous variables as follows: there were positive significant parameters estimate with a path from job demands to job support ($\beta = .22$, $p < .05$), a path of job support to job control ($\beta = .69$, $p < .001$), a path from job control to job stress ($\beta = .22$, $p < .01$) and a path from job demands to job stress ($\beta = .80$, $p < .001$). Whilst, the negative direction was a path from job demands to job control ($\beta = -.19$, $p < .05$).

According to the result, this modified model was used to test the research hypotheses. The result of the modified model is provided in Figure 12 and the fit indices between the hypothesized and modified model are compared in Table 7.
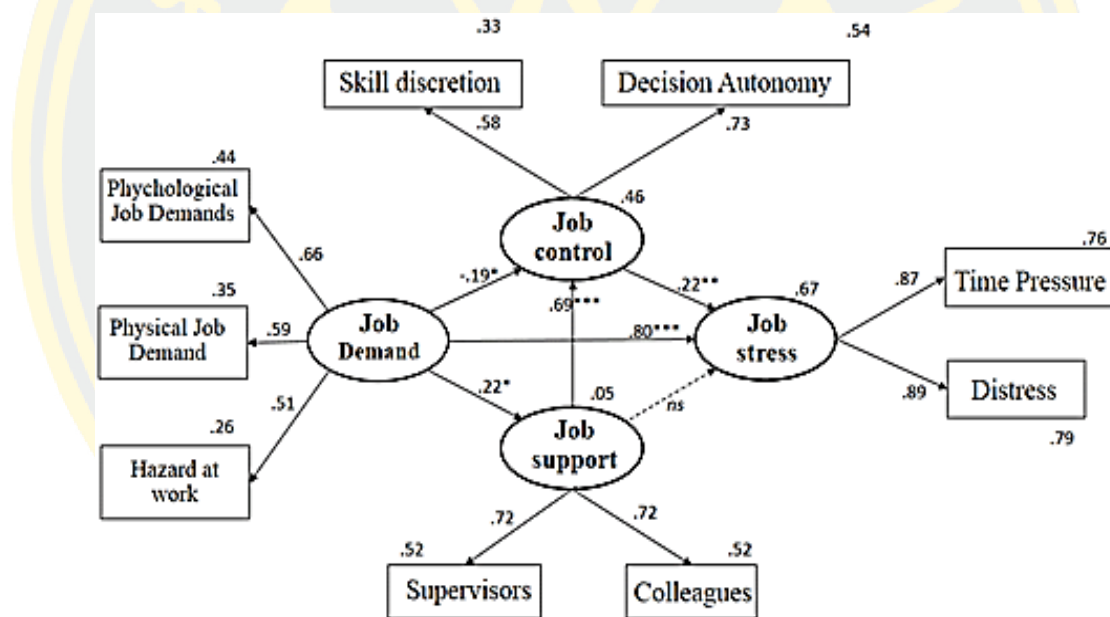


$\chi2 = 57.76$, df = 22, CMIN/df = 2.62, GFI = .96, AGFI = .91, CFI = .95, and RMSEA = .07, ns = non-significant, *$p < .05$, **$p < .01$, ***$p < .001$

Figure 12 The modified model of the effects of job demands, job control, and job support on job stress among intrapartum nurses

Table 7 Statistics of model fit index between the hypothesized model and the
        modified model ($n = 272$)

| Model fit criterion | Acceptable score | Hypothesized model | Modified model |
|---|---|---|---|
| CMIN | p > .05 | χ2 = 57.70 | χ2 = 57.76 |
|  |  | $p$ = .000 ($df$ = 21) | $p$ = .000 ($df$ = 22) |
| CMIN/$df$ | < 3.0 | 2.74 | 2.62 |
| GFI | > .90 | .96 | .96 |
| AGFI | > .90 | .91 | .91 |
| CFI | CFI > .90 | .95 | .95 |
| RMSEA | ≤ .05 | .08 | .07 |

       In summary, the results showed that the modified model contained the four
variables: job demands, job control, job support, and job stress. They explained 67%
of the total variance for job stress. The total effects are shown in Table 8.

Table 8 Parameter estimates of direct, indirect, and total effects of modified model
        ($n = 272$)

| Variables | Job control | | | Job support | | | Job stress | | |
|---|---|---|---|---|---|---|---|---|---|
|  | DE | IE | TE | DE | IE | TE | DE | IE | TE |
| Job demands | -.19* | - | -.19* | .22* | - | .22* | .80*** | -.01 | .79 |
| Job control | - | - | - | - | - | - | .22* | - | .22* |
| Job support | .69*** | - | .69*** | - | - | - | - | .15 | .15 |
|  | $R^2$ = .46 | | | $R^2$ = .05 | | | $R^2$ = .67 | | |

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

Note: DE = direct effect, IE = indirect effect, TE = total effect

## The study findings in responding to research hypotheses

In this study, three hypotheses were tested as follows:

**Hypothesis 1**: Job demands have a direct positive effect on job stress and have an indirect effect on job stress among intrapartum nurses through job control and job support.

The statistical analysis revealed that job demands have a significant direct positive effect on job stress ($\beta = .80$, $p < .001$) and the indirect effect on job stress through job control. Job demands have a significant negative effect on job control ($\beta = .19$, $p < .01$), and job control have a significant positive effect on job stress ($\beta = .22$, $p < .01$). In the light of the effect on job stress through job support, the results have shown that job demands have a significant direct positive effect on job support ($\beta = .22$, $p < .01$). Whilst, job support has a non-significant negative direct effect on job stress ($\beta = -.04$, $p = .795$). Therefore, the study findings had partially supported this hypothesis.

**Hypothesis 2:** Job control has a direct negative effect on job stress among intrapartum nurses.

The result found that job control has a significant direct positive effect on job stress ($\beta = .22$, $p < .01$). Therefore, this finding is a significant contrary direction effect with the hypothesis.

**Hypothesis 3:** Job support has a direct negative effect on job stress and has an indirect effect on job stress among intrapartum nurses through job control.

The statistical analysis revealed that job support has a non-significant direct negative effect on job stress ($\beta = -.04$, $p = .795$), and this path was deleted in the model. In the light of an indirect effect on job stress through job control, the results have shown that job support has a significant direct positive effect on job control ($\beta = .69$, $p < .01$), and job control has a significant direct positive effect on job stress ($\beta = .22$, $p < .001$). This result performed that job support has no direct negative effect on job stress. On the other hand, job support had an indirect effect on job stress among intrapartum nurses through job control. Therefore, the study findings had partially supported this hypothesis.

**Summary**

This model has analyzed the effects of job demands, job control, and job support on job stress among intrapartum nurses in Thailand. There is an exogenous variable as job demands, mediator variables as job control and job support, and an endogenous variable as job stress.

The finding from descriptive statistics shown the demographic characteristics among intrapartum nurses. Descriptive of four major variables as job demands, job control, job support, and job stress were indicated. The assumption testing by outlier, linearity, and multicollinearity of all variables was tested in the preliminary analyses and found acceptable regarding the assumptions for the multiple regression statistics used.

Results revealed the hypothesized model should be modified because the parameter estimates from job support to job stress were found no significant relationship, although the GOF values of the hypothesized model are accepted (CMIN = 57.70, $df$ = 21, CMIN/$df$ = 2.74, GFI = .96, AGFI = .91, CFI = .95, and RMSEA = .08). According to the hypotheses result, the model was modified until the goodness of fit indices were in a goodness of fit level. In the final modification mode, the result demonstrated model fit the empirical data (CMIN = 57.76, $df$ = 22, CMIN/$df$ = 2.62, GFI = .96, AGFI = .91, CFI = .95, and RMSEA = .07). They explained 67% of the total variance for job stress.

# CHAPTER 5
# CONCLUSION AND DISCUSSION

This chapter is divided into three sections. The first section provides a general overview of the research. In the second section, the research findings in relation to the research hypotheses are discussed, as well as the final model's outcomes. Finally, limitations, implications, and recommendations are discussed.

## Summary of the study

This study design for causal modeling aimed to test the hypothesized model of the effects of job demands, job control, and job support on job stress among intrapartum nurses in Thailand. The hypothesized model was developed based on the JDCS model also known as the Job Strain model by Karasek and Theorell (1990) that consists of job demands, job control, and job support in combination with empirical evidence. The multi-stage random sampling procedure was conducted to recruit a sample of RNs who have been working at the labor room (intrapartum nurses) for at least six months in providing maternal and child healthcare services. A total of 272 intrapartum nurses were selected from sixteen randomly sampled hospitals that had been randomly drawn from four geographic regions in Thailand. All of them worked in regional hospitals under the jurisdiction of the Ministry of Public Health, Thailand.

A number of research instruments of self-report questionnaires were used for data collection, including demographic data, the TJCQ, and Job Stress Scale (Thai version). Each of the instruments had acceptable validity and reliability. The assumptions of an outlier, normality of distribution, linearity, and multicollinearity did not violate the rules for analyzing SEM. AMOS software application was conducted to test the hypothesized model of job stress among intrapartum nurses and examined the magnitude of causal effects, both direct, and indirect effects among the relationships of the study variables in the model.

All of the participants were female (100%) and their ages ranged from 23 to 60 years old with a mean age of 36.8 years. More than forty percent of the

participants' ages were around 23 to 30 years old (41.2 %). Approximately half of the participants were married (50.7 %) and most of them have no child (59.6 %).

Most of the participants have graduated at the bachelor's degree level (94.1 %). More than half of the participants had working experience as intrapartum nurses less than ten years (54.8 %) and almost half of them had monthly incomes of more than 30,001 Baht per month (47.8 %). Most of the participants worked duties as rotating shifts (Days/ evening/ night shift) (89.7 %) and more than half of them work as shifts 20-25 per month (63.3 %). In the past year, the majority of participants have been supported to participate in a conference in order to develop skills in midwifery, maternal and child, or related to the job more than ten hours per year (65.8 %).

According to the model testing found that the initial hypothesized model did not fit empirical data. Therefore, it was modified until the final model achieved the goodness-of-fit criterion.

In the final modification mode, the result demonstrated model fit the empirical data and the goodness-of-fit criterion showed that CMIN = 57.76, df = 22, CMIN/ df = 2.62, GFI = .96, AGFI = .91, CFI = .95, and RMSEA = .07.

To consider the direct and indirect effects on job stress among intrapartum nurses found that job demands had a significant direct positive effect on job stress ($\beta = .80$, $p < .001$) and the indirect effect on job stress through job control only. Job demands had a significant direct negative effect on job control ($\beta = -.19$, $p < .01$), and job control had a significant direct positive effect on job stress ($\beta = .22$, $p < .01$).

In the light of job support, it had a non-significant negative direct effect on job stress ($\beta = -.04$, $p = .795$) and this path was deleted in the model. Therefore, job support did not mediator between job demands and job stress significantly ($\beta = -.04$, $p = .795$). But the role of job support, it had a significant direct positive effect on job control ($\beta = .69$, $p < .01$). This result performed that job support has an indirect effect on job stress among intrapartum nurses through job control. In addition, job demands had a significant direct positive effect on job support ($\beta = .22$, $p < .01$) as well.

Finally, job demands, job control, and job stress were explained 67% of the total variance of job stress ($R^2 = .67$).

## Discussion

The main purpose of this study was to test a causal model of the effect of job demands, job control, and job support on job stress among intrapartum nurses. The theorethecal that used to guide in this study was JDCS model by Karasek and Theorell (1990); consists of job demands, job control, and job support that provided a lens through which job stress among intrapartum nurses. The findings of this study was supported by the theoretical background, literatures, and research evidences, which discussed the findings according to the purpose of this study follows:

### Effect of job demands on job stress

This study used the classification of the job demands based on theorethical and literatures by three broad categories of demands: physical job demands, psychological job demands, and hazard at work that effect on job stress. From the perspective of JDCS model indicated that job demands can cause job stress when workers perceive an imbalance of all aspects of work (Karasek, 1979; Karasek and Theorell, 1990; Baba et al., 2013; Kokoroko and Sanda, 2019). Consistent with the result revealed that job demands had a significant direct positive effect on job stress and an indirect effect of job demands on job stress through job control was significant as well. On the other hand, job demands had no significant indirect effect on job stress through job support. Hence, this hypothesis was partially supported in the direct effect of job demands on job stress among intrapartum nurses.

These findings indicated that high job demands are the leading cause of job stress significantly and could be explained based on the job demands concept. On this point, theorists concurred that perceived job demands which are in the form of high psychological, physical job demands, hazards at work, and insecurity work contribute to feelings of job stress among individuals (Karasek, 1979; Parker & DeCotiis, 1983; Russell, Maitre, Watson, & Fahey, 2018).

Job demands are all aspects of a job that involve continual physical and/or psychological (i.e., cognitive or emotional) effort including organization as well (Bakker, & de Vries, 2021; Mayerl, Stolz, Waxenegger, Rásky, & Freidl, 2016). This might be explained that all aspects related to a job can affect feelings of job stress when demands are excessive over an intrapartum nurses' ability to control. Job demands can have both good and negative consequences. Depending on the nature of

the job demands and the individual's capacity to deal with them. Likewise, this study was conducted among intrapartum nurses who work in regional hospitals. Based on the context, these hospitals are demanding with high job demands. The regional hospitals are a complex structure, severe and complicated patients, and high technology for investigating (Thrathip, & Chantima, 2015). The expectation of patients and relatives is to require the best possible treatment from the physician and high-quality nursing care. Therefore, it is possible that intrapartum nurses who work in these hospitals encounter high job demands as well.

To consider physical and psychological job demands, intrapartum nurses need to develop and improve their skills for advanced knowledge in pregnancy care. Simultaneously, the use of new technologies in medical treatment introduces new high job demands in terms of learning new knowledge and mastering new skills (Montgomery, Spânu, Băban, & Panagopoulou, 2015). These procedures required the effort and time of intrapartum nurses include organizational support as well. As team members of multidisciplinary teams with pediatric nurses, pediatricians, and obstetricians, they must be learning to function semi-autonomously (Kool, Schellevis, Jaarsma, & Feijen-De Jong, 2020) in order to collaborate and reduce conflict with other multidisciplinary. Moreover, they have to show their competence in order to build trust and reliability for collaboration with colleagues and supervisors.

In emergency situations, intrapartum nurses suffered a tremendous workload and strain in emergency scenarios when they must coordinate with operating rooms and obstetricians at the same time, as well as make quick choices in a short amount of time. Moreover, intrapartum nurses must be dealing with obstetrics emergencies and also must have prepared nursing care for high-risk pregnancies that are referred from primary care. The combination of coordinating various deliveries and consultations resulted in a significant amount of effort that means more physical and psychological job demands. For example, intrapartum nurses who take care of pregnant women in mid-and high-risk care are confronted with high workload and pressure from an expectation of pregnant women and relatives. They also have to deal with the hectic and unpredictable nature of the labor rooms.

Furthermore, the variety of the work and amount risk of incidence of hazard at work in a regional hospital not only as intrapartum nurses but also they have the

amount of paperwork required responsibility for quality document and hospital accreditation. This is because the characteristics of regional hospitals will make intrapartum nurses feel the workload strongly. Perhaps long working hours or overtime work is the main reason for intrapartum nurses' perception of long-term stress, yet it is inevitable. As a direct consequence, they were exposed to high job demands that are significant causal of job stress.

Numerous studies have examined the relationship between job demands and job stress among nurses and midwives (Baba et al., 2013; Grech & Hili, 2019; Grech & Hili, 2019; Kokoroko & Sanda, 2019). Where Grech and Hili (2019) reported that midwives who working under pressure and having a high workload perceived psychological distress and burnout. Consistent with the study of Navajas-Romero et al. (2020), conducted a larger study was constructed with a sample of 991 nursing and midwifery professionals from 35 European countries were used. By adopted the job demand-control-support model on work-life balance. The results obtained confirm that the high job demands faced by nursing and midwifery professionals have been negatively associated with work-life balance (high psychological job demands: $\beta = -.52$, $p < .001$ and high physical job demands: $\beta = -.61$, $p < .001$). Higher job demands are an important predictor of job stress (Shahzad, 2019). Nursing and midwifery professionals who are confronted with high job demands might experience strong job stress, and these factors lead to a degree of work-life imbalance.

In conclusion, the evidence presented helps to illuminate the positive effect of job demands had a significant influence on job stress. Therefore, the result of this study can explain the effect of job demands on job stress among intrapartum nurses which is in accordance with the hypothesis and several studies.

**Effect of job control on job stress**

Job control or decision latitude theoretically is described as a worker's control over his or her job performance, which includes the ability to decide which skills to employ to complete the task, autonomy, and opportunity to influence organizational-level issues and decisions (Karasek, 1979; Karasek & Theorell, 1990). Hence, theorists stated that employees who reported less decision latitude and more psychological demands had a higher risk of any common mental disorder (Bonsaksen, Thørrisen, Skogen, & Aas, 2019; Stansfeld & Candy, 2006).

This finding revealed that job control has a significant direct positive effect on job stress. Even though job control played a mediator in the relationship between job demand, job support, and job stress, turned to positive with job stress as well. This finding implies that the result is a significant contrary direction effect with the hypothesis. A reasonable explanation in this study may be that the intrapartum nurses might perceive higher job control as a stressor. Intrapartum nurses may be given assigned responsibilities in decision-making, process, in-charge nurse, and scheduling as a consequence of high job control, which ultimately increases workload and job stress. Previous studies suggest that job control might mitigate the negative impacts of high job demands on health and well-being (Karasek, 1979; Karasek & Theorell, 1990). Another study found that their findings did not support the hypothesis. Nasurdin, Quah, and Lim. (2006) showed no direct effect job control on job stress among employees on the island of Penang, Malaysia.

Moreover, the finding was in accordance with the cross-sectional (Study 1) and longitudinal (Study 2) studies (Kubicek, Korunka, & Tement, 2014), which found that high levels of job control decrease well-being among eldercare workers in private and public nursing homes. The studies indicated that the long-term impact of job control on burnout can measure long-term work-related well-being. Furthermore, eldercare professionals with more job control have a lower tendency to feel committed to, engaged by, and energized at work, which includes being more likely to depersonalize the elderly.

Job support could be another reason for the failure to support the theorized between job control and job stress. Despite the fact that the role of support may help reduce job stress, improve mental well-being, and increase job control (Mensah, 2021). On the other hand, high job control from the support of the supervisor might change one's social identity and standing in the workgroup, resulting in resentment from colleagues and/or pressure to meet increased expectations of one's supervisor. The same mechanisms that diminish well-being when support is low might also reduce well-being when support is very high as well (Somers, Birnbaum, & Casal, 2021).

It could be explained that when intrapartum nurses receive high job support from supervisors such as promote continuous education and skill training to be able

intrapartum nurses to enhance their job control, they felt pressure to meet increased expectations of their supervisor and colleagues. Thus, boomerang effects might increase stress and diminish well-being (Harris & Kacmar, 2005). This finding is consistent with Warr's vitamin model. In an analogy to vitamin intake, Warr (1994) argues that the physiological effect of vitamin intake; at first vitamin, consumption causes beneficial health effects, but, at a certain point, there is no further improvement or perhaps worse for health. Most work characteristics, such as job demands and decision latitude, have beneficial effects up to a limit, beyond that point, the effect appears to be negative.

Especially, Warr (1994) provides reasons for explaining this phenomenal effect, all of which may be applied to job control. First, high levels of job control may not be considered as a "nicety" at the workplace but more as a workplace "necessity". Second, high degrees of job control has been associated with numerous negative job characteristics, such as a high workload. Third, high degrees of job control may be linked to a lack of other desired job support from colleagues.

In conclusion, intrapartum nurses who have high job control might consider high job control lead to a number of job demands. The evidence reviewed that high job control becomes more stressors for intrapartum nurses. It means that the finding was significantly contrary to the hypothesis.

**Effect of job support on job stress**

Based on the JDCS model state that job support is defined as all degrees of supportive engagement from supervisors and colleagues provided on the job. (Johnson & Hall, 1988; Karasek & Theorell, 1990; Theorell & Karasek, 1996). The theorists stated that job support from supervisors tends to promote employees' personal resources and intrapersonal motivation reactions and reduce employees' stress reactions (Jolly, Kong, & Kim, 2020) and job support from colleagues is a contribution to employees share information and have high learning opportunities (Vera et al., 2015).

According to the findings, the path between job support and job stress was deleted in the model. By reason of the results found that job support has a non-significant direct negative effect on job stress. On the other hand, job support has a

significant direct positive effect on job control and an indirect effect on job stress among intrapartum nurses through job control.

With respect to the job support concept, theorists posit that job support is an inverse relationship with job stress (Karasek & Theorell, 1990). The previous studies revealed that better job support is a good way to reduce job stress among nurses in China (Yu et al., 2014) and among Japanese nurses, job support from supervisors is important in preventing intention to leave and depressive symptoms (Saijo et al., 2016; Yoshizawa et al., 2016). Although in this study, job support had no significant direct effect on job stress but had an indirect effect and an important role in job stress via job control. In short, the study findings had partially supported the theory proposition.

One feasible explanation for this finding could be due to the fact that job support will only function when employees perceive that support. In other words, job support is unable to have a direct effect on job stress on its own, but it requires those who are acting as mediators in order to inform how job support affects job stress. Similarly, intrapartum nurses act as media to inform how job support from supervisors and colleagues affects job stress.

In this case, job support may moderate the relationship between authority decisions and the skill discretion of intrapartum nurses. For example, if intrapartum nurses receive strong job support from their supervisors and colleagues, such as promotion and recognition, continuous education and skill training, and emotional support, they will feel more secure and have more skills in their job, including support and acceptance of their decisions (Vera et al., 2015). All of that job support improves their skills discretion and decision authority. Job support may moderate the relationship between job autonomy and skill decision (Karasek & Theorell 1990).

According to the current findings, it can be concluded that job support has no direct effect on job stress but highlights that job support has a significant indirect effect on job stress among intrapartum nurses through job control.

**Conclusion**

The findings clearly confirmed the effects of job demands, job control, and job support on job stress among intrapartum nurses in Thailand. The results concerning the total effect of job demands indicated job demands contribute

significantly effect to explaining the source of job stress, that is, in case of increased job demands job stress be emerging obviously. At the theoretical level, job control played a crucial role in directly affect to reduce job stress. However, the present research provided contrary evidence with theoretical. The findings of this study did not support the theoretical propositions that increased job control is related to a decrease in job stress among intrapartum nurses. On the other hand, when intrapartum nurses perceive high job control, they perceive pressure to face the expectations from their supervisor and colleagues. Likewise of job support, the results found that job support had no direct effect on job stress but an indirect effect on job stress among intrapartum nurses through job control.

Among the variables tested, job demands were the strongest predictors of job stress among intrapartum nurses. Moreover, the findings indicated that the effects between job support and job control contribute a significant amount of variance on job stress over and above the variance explained by both. However, the effects of job demands, job control, and job support on job stress among intrapartum nurses in Thailand can explain 67% of the total variance for job stress.

## Limitation of the study

There are several limitations of the study that should be noted. First, the measurement might be not specific to intrapartum nurses. Thai Version of JCQ was developed to investigate the psychosocial work environment for the general profession and some items did not specific to intrapartum nurses. This might affect the results of this study. Second, this study focused on intrapartum nurses specialty. As such, this finding should be noted that there may be different the result between different groups of other specialty (e.g., emergency nurses and critical care nurses). Another limitation is that the research was conducted using a cross-sectional methodology. Caution should be used when interpreting a causal relationship.

## Implications and recommendations

### Implications for nursing administration and policy

In the present acknowledge job stress is a huge problem that threatens health care professionals especially nurses. This significant finding from this study can contribute the new knowledge to clarify the influence of significant factors of job stress which included job demands, job control, and job support among intrapartum nurses. These analyses provide some evidence for nursing administrators and policymakers that the work design approach to human resource management may need to be reconsidered and try to keep a balance between job demands, job control, and job support in order to decrease job stress among intrapartum nurses. The following are some suggestions

**1. Implications related to job demands:** The finding of this study revealed that job demands are the strongest causal of job stress. Therefore, nursing administrators and policies maker should review job demands, job descriptions, and a workforce of intrapartum nurses up to date and appropriate for nursing shortages and pandemics situations. Nursing administrators and policymakers need to develop a new method to appraise and calculate full-time equivalent [FTEs] of nursing as a matter of fact. This should cover the direct and indirect performances of intrapartum nurses which concern patients and organizations directly. In order to recognize the true workload of intrapartum nurses and improve appropriate workforce management. For instance, cases of the labor room, emergency cases of ceasarean, including prenatal care in preparation for caesarean section are not rated because the operation rooms claim FTEs for the workload. Consequently, FTEs are less than reality and the workforce is extremely short while they have a high workload. In addition, work procedures should be reviewed and consider minimizing document workload with increasing clerical staff to reduce non-nursing tasks. New technologies, nursing informatics, and equipment should be used to decrease the workload of intrapartum nurses and make their tasks less demanding wherever possible and suitable.

Providing a better working environment for nurses. When hospitals are short on medical personnel, especially nurses, the burden for those who remain must necessarily increase. As a result, tiredness and physical and emotional stress may be detrimental to intrapartum nurses' health. As a consequence, an excessive workload

may jeopardize patient safety. To avoid this, policies must be developed to guarantee the health and well-being of both staff and patients, which should be a top priority for any hospital. For example, supervisors should evaluate periodically for the consideration of staffing adequacy. Workload and job stress among intrapartum nurses should be reviewed on a regular basis. Provide equitable chances for intrapartum nurses to participate in the design of work schedules, particularly with regard to shifting work, in an effort to enhance work-life balance and team workforce management.

      **2. Implications related to job control and job support:** The finding of this study revealed that job support is an external resource that helps to promote job control among intrapartum nurses. This is a good social capital for intrapartum nurses. While job control is an internal resource of intrapartum nurses that helps them to deal with high job demands. But the findings found that high job control becomes increase job stress for intrapartum nurses. This is a major contribution of this study. Supervisors have traditionally assumed that those who have high job control are appropriate to provide support and assign more workload. This might be a boomerang effect of high job control.

      Therefore, policymakers and nursing administrators should be concerned with this effect. Supervisors should carefully allocate job expectations to them and avoid assigning heavy workloads for those who have high job control. These workloads might be burden more than challenge their work duty. For example, usually, intrapartum nurses who have high job control are assigned workload, document, and responsible for information technology of the unit more than other intrapartum nurses. Furthermore, policymakers and supervisors should consider individual skills of intrapartum nurses and preferences, as well as how they may evolve over time. Understanding what aspects of job control and job support can achieve the best outcomes for intrapartum nurses at all levels, might be crucial to improve job stress.

      Noticeable, retaining their well-being despite high job demands was their ability to manipulate a positive spin on their problems. This implies that nursing administrators and supervisors should try to improve intrapartum nurses' capacity to effectively reappraise conditions by implementing interventions that encourage them

to think positively about the benefit of job control. In addition, interventions can help intrapartum nurses discover their areas of strength and learn from each other. For example, supervisors need to encourage their intrapartum nurses, who may lack confidence, skills, and job autonomy, to persist with their tasks and support grants for developing skills and knowledge even if everything does not go perfectly and to provide intrapartum nurses with the ability to control how they accomplish their tasks.

Thus, supervisors should be proper human resources planning and support resource to anyone thoroughly including how to develop intrapartum nurses and what level of experience and competence would be needed, as well as what roles they will be provided at all levels.

Nursing administrators should provide training and increase the necessary knowledge to perform jobs effectively of intrapartum nurses. For example, nursing administrators should be prepared special courses related to litigation in obstetrics with nursing and dealing with stress from these situations. Moreover, intrapartum nurses should be provided an opportunity to engage in decisions and actions that benefit their work in order to resolve stress-producing situations effectively.

**Recommendations for future research**

This research finding provides a guide for future research as follows.

1. It is recommended that further qualitative research should be done to find in-depth detailed information about the perspective of job demands, job control and job support from intrapartum nurses.

2. Due to the nursing shortage, it is necessary to develop effective intervention programs that are appropriate for intrapartum nurses' tasks, as well as to create an optimal working environment for them in terms of balancing job demands, job control, and job support in order to reduce job stress, improve retention, and performance.

3. Future studies should include other new variables that might be related to job stress and more specific to the context and culture of intrapartum nurses or other nurses, such as work-life balance, workforce, and coping skills, in order to reduce stress and burnout and the likelihood of quitting their jobs in the near future.

# REFERENCES

Achour, M. (2014). Supervisory support as a moderator of work-family demands and life satisfaction among Malaysian female academicians. *World Applied Sciences Journal, 28*, 32-37.

Addae, H. M., & Wang, X. (2006). Stress at work: Linear and curvilinear effects of psychological-, job-, and organization-related factors: An exploratory study of Trinidad and Tobago. *International Journal of Stress Management, 13*, 476-493.

Adriaenssens, J., De Gucht, V., & Maes, S. (2015). Determinants and prevalence of burnout in emergency nurses: A systematic review of 25 years of research. *International Journal of Nursing Studies, 52*(2), 649-661.

Adriaenssens, J., Hamelink, A., & Bogaert, P. V. (2017). Predictors of occupational stress and well-being in first-line Nnurse managers: A cross-sectional survey study. *International Journal of Nursing Studies*, *73*, 85-92.

Agheli, R., Roshangar, F., Parvan, K., Sarbakhsh, P., & Shafeh, S. (2017). Work stress and organizational citizenship behaviors among nurses. *Annals of Tropical Medicine & Public Health, 10*(6), 1453-1459.

Akbari, J., Akbari, R., Shakerian, M., & Mahaki, B. (2017). Job demand-control and job stress at work: A cross-sectional study among prison staff. *Journal of Education and Health Promotion*, *6*(1), 15-15.

Albort-Morant, G., Ariza-Montes, A., Leal-Rodríguez, A., & Giorgi, G. (2020). How does positive work-related stress affect the degree of innovation development? *International Journal of Environmental Research and Public Health, 17*(2), 520-534.

Al-Homayan, A. M., Shamsudin, F. M., Subramaniam, C., & Islam, R. (2013). Impacts of job demands on nurses' performance working in public hospitals. *American Journal of Applied Sciences*, *10*, 1050-1060.

Al-Homayan, Z., Banerjee, T., & Manojlovich. (2018). Communication with physicians as a mediator in the relationship between the nursing work environment and select nurse outcomes in Jordan. *Journal of Nursing Scholarship, 50*(6), 714-721.

Almendra, C. A. (2010). *Relationships among job demand, job control, social support and job stress in registered nurses working in skilled nursing facilities.* Retrieved from https://rucore.libraries.rutgers.edu/rutgers-lib/27158/

Alomani, Q. (2016). Causes and effects of occupational stress in nursing. In *Proceedings of 17th IASTEM International Conference* (pp. 978-993). Istanbul, Turkey: International Academy of Science, Technology, Engineering and Management. Retrieved from http://www.worldresearchlibrary.org/up_proc/pdf/217-145959057612- 18.pdf

Anderson, A. (2013). Ten years of maternity claims: An analysis of the NHS litigation authority data - key findings. *Clinical Risk, 19*(1), 24-31.

Andrews, M. C., & Kacmar, K. M. (2014). Easing employee strain: The interactive effects of empowerment and justice on the role overload-strain relationship. *Journal of Behavioral & Applied Management, 15*(2), 43-58.

Aoki, M., Keiwkarnka, B., & Chompikul, J. (2011). Job stress among nurses in public hospitals in Ratchaburi province, Thailand. *Journal of Public Health and Development, 9(1)*, 19-27.

Ariani, D. W. (2015). Relationship with supervisor and co-workers, psychological condition and employee engagement in the workplace. *Journal of Business and Management, 4*, 34-47.

Australian institute of health and welfare. (2015). *National health workforce data set: Medical practitioners 2015: Quality statement.* Retrieved from http://www.aihw.gov.au/workforce/medical/

Baba, V., Tourigny, L., Wang, X., Lituchy, T., & Monserrat, S. (2013). Stress among nurses: A multi-nation test of the demand-control-support model. *Academy of Management Annual Meeting Proceedings, 20*(3), 301-320.

Bagheri Hossein Abadi, M., Taban, E., Khanjani, N., Naghavi Konjin, Z., Khajehnasiri, F., & Samaei, S. E. (2021). Relationships between job satisfaction and job demand, job control, social support, and depression in Iranian nurses. *Journal of Nursing Research*, *29*(2). e143. doi.org/10.1097/jnr.0000000000000410

Bai, J., & Ravindran, V. (2019). Job stress among nurses. *Indian Journal of Continuing Nursing Education*, *20*(2), 92-96.

Bakker, A. B., & de Vries, J. D. (2021). Job demands-resources theory and self-regulation: New explanations and remedies for job burnout. *Anxiety, Stress, & Coping, 34*(1), 1-21.

Bani-Hani, M. A., Hamdan-Mansour, A. M., Atiyeh, H. M., & Alslman, E. T. (2016). Theoretical perspective of job demands correlates among nurses: Systematic literature review. *Health*, *8*, 1744-1758.

Bánovčinová, Ľ. (2017). Work-related stress and coping among midwives in Slovakia. *Central European Journal of Nursing and Midwifery, 8*(3), 667-674.

Banovcinova, L., & Baskova, M. (2014). Sources of work-related stress and their effect on burnout in midwifery. *Procedia - Social and Behavioral Sciences*, *132*, 248-254.

Barrett, P. (2007). Structural equation modelling: Adjudging model fit. *Personality and Individual Differences, 42*(5), 815-824.

Batista-Taran, L. C., & Reio, T. G. (2011). Occupational stress: Towards an integrated model. In M. S. Plakhotnik, S. M. Nielsen, & D. M. Pane (Eds.), *Proceedings of the Tenth Annual College of Education & GSN Research Conference* (pp. 9-16). Miami: Florida International University.

Baye, Y., Demeke, T., Birhan, N., Semahegn, A., & Birhanu, S. (2020). Nurses' work-related stress and associated factors in governmental hospitals in Harar, Eastern Ethiopia: A cross-sectional study. *PLoS One*, *15*(8), e0236782. https://doi.org/10.1371/journal.pone.0236782

Beheshtifar, M. (2013). Role of occupational stress in organizations. *Interdisciplinary Journal of Contemporary Research in Business, 4(*9), 648-657.

Besen, E. T. (2013). *The job demands-control-support model: Understanding the implications of age.* Doctoral dissertation, Developmental and Educational Psychology, Boston College University.

Bhui, K., Dinos, S., Galant-Miecznikowska, M., de Jongh, B., & Stansfeld, S. (2016). Perceptions of work stress causes and effective interventions in employees working in public, private and non-governmental organisations: A qualitative study. *BJPsych Bulletin*, *40*(6), 318-325.

Blanch, A. (2016). Social support as a mediator between job control and psychological strain. *Social Science & Medicine, 157*, 148-155.

Blunch, N. J. (2013). *Introduction to structural equation modelling using IBM SPSS statistics and AMOS* (2nded.). London: SAGE Publications.

Bonsaksen, T., Thørrisen, M. M., Skogen, J. C., & Aas, R. W. (2019). Who reported having a high-strain job, low-strain job, active job and passive job?. The WIRUS Screening study. *PLoS One, 14*(12). e0227336.

Brennan, J., & Lo, W. (2011). The origin of behavior. *The Quarterly Journal of Finance, 1*(1), 55-108.

Browning, L., Ryan, C. S., Thomas, S., Greenberg, M., & Rolniak, S. (2007). Nursing specialty and burnout. *Psychology, Health & Medicine, 12*(2), 148-154.

Buakhai, P., & Rithpho, P. (2019). Reflections of positive experiences in midwifery and nursing of maternal-newborn education in thailand: Lessons learned from Naresuan University. *Journal of Health and Caring Sciences*, *1*, 110-117.

Burns, N., & Grove, S. K. (2009). *The practice of nursing research: Appraisal, synthesis and generation of evidence* (6thed.). St. Louis: Saunders Elsevier.

Byrne, B. M. (2010). *Structural equation modeling with AMOS: Basic concepts, applications, and programming* (2nd ed.). London: Routledge/ Taylor & Francis Group.

Centers for Disease Control and Prevention [CDC]. (2008). *Exposure to stress occupational hazards in hospitals*. Columbia: DHHS (NIOSH) Publication.

Chabeli, M. M., Malesela, J. M. L., & Nolte, A. G. W. (2017). Best practice during intrapartum care: A concept analysis. *Health SA Gesondheid, 22*, 9-19.

Chan, Z., San Tam, W., Maggie K.Y. Lung, Yan Wong, W., & Wa Chau, C. (2012). A systematic literature review of nurse shortage and intention to leave. *Journal of Nursing Management*, *21*, 605-613.

Chaudhari, A., Mazumdar, K., Motwani, Y., & Ramadas, D. (2018). A profile of occupational stress in nurses. *Annals of Indian Psychiatry*, *2*, 109-114.

Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern Methods for Business Research, 295*(2), 295-336.

Choo, L. S., & Nasurdin, A. (2016). Supervisor support and work engagement of hotel employees in Malaysia. *Gender in Management: An International Journal, 31,* 2-18.

Chou, M. M. (2006). Litigation in obstetrics: A lesson learnt and a lesson to share. *Taiwanese Journal of Obstetrics and Gynecology, 45*(1), 1-9.

Clegg, A. (2001). Occupational stress in nursing: A review of the literature. *Journal of Nursing Management, 9*(2), 101-106.

Cole, D. C., Ibrahim, S., & Shannon, H. S. (2005). Predictors of work-related repetitive strain injuries in a population cohort. *American Journal of Public Health, 95(7),* 1233-1237.

Cooper, C. L. (1981). *The stress check: Coping with the stresses of life and work.* New Jersey: Prentice Hall.

Cramer, E., & Hunter, B. (2019). Relationships between working conditions and emotional wellbeing in midwives. *Women Birth*, *32*(6), 521-532.

Creedy, D., Sidebotham, M., Gamble, J., Pallant, J., & Jennifer, F. (2017). Prevalence of burnout, depression, anxiety and stress in Australian midwives: A cross-sectional survey. *BMC pregnancy and childbirth, 17*(1), 13.

Dagget, T., Molla, A., & Belachew, T. (2016). Job related stress among nurses working in Jimma Zone public hospitals, South West Ethiopia: A cross sectional study. *BMC Nursing, 15*, 39-39.

Daniels, K., Boocock, G., Glover, J., Holland, J., & Hartley, R. (2009). An experience sampling study of learning, affect, and the demands control support model. *Journal Applied Psychology, 94*(4), 1003-1017.

Dawson, K. M., O'Brien, K. E., & Beehr, T. A. (2016). The role of hindrance stressors in the job demand-control-support model of occupational stress: A proposed theory revision. *Journal of Organizational Behavior, 37*(3)*,* 397-415.

Del Pozo-Antunez, J. J., Ariza-Montes, A., Fernandez-Navarro, F., & Molina-Sanchez, H. (2018). Effect of a job demand-control-social support model on accounting professionals' health perception. *International Journal of Environmental Research and Public Health*, *15*(11), 1-16. doi.org/10.3390/ijerph15112437

Deng, J., Guo, Y., Ma, T., Yang, T., & Tian, X. (2019). How job stress influences job performance among Chinese healthcare workers: A cross-sectional study. *Environmental Health and Preventive Medicine, 24*(1), 1-11.

Dewe, P., & Kompier, M. (2008). *Foresight mental capital and wellbeing project. wellbeing and work: future challenges.* London: The Government Office for Science.

Dissakul, B., & Sorakraikitikul, M. (2018). Insight of public civil servants: Public service motivation and benefit. *Business Review Journal, 10*(1), 55-72.

Dobnik, M., Maletič, M., & Skela-Savič, B. (2018). work-related stress factors in nurses at Slovenian hospitals - A cross-sectional study. *Slovenian Journal of Public Health, 57*(4), 192-200.

Dumrongsiri, A., & Chongphaisal, P. (2018). Nurse scheduling in a hospital emergency department: A case study at a Thai university hospital. *Songklanakarin Journal of Science and Technology*, *40*, 187-196.

Edmonds, J. K., & Jones, E. J. (2013). Intrapartum nurses' perceived influence on delivery mode decisions and outcomes. *Journal of Obstetric, Gynecologic, & Neonatal Nursing, 42*(1), 3-11.

Eiu-Seeyok, B. (2018). *Quality and safety of inter-hospital transfers care of critically ill patients from rural community hospitals to the tertiary regional hospital in Thailand: A focused ethnographic study*. Doctoral dissertation, Nursing, University of Edinburgh.

Elfering, A., Semmer, N. K., & Grebner, S. (2006). Work stress and patient safety: Observer-rated work stressors as predictors of characteristics of safety-related events reported by young nurses. *Ergonomics, 49*(5-6), 457-469.

Forbes, L. C., & Jermier, J. M. (2015). Workplace autonomy. In J. D. Wright (Ed.), *International encyclopedia of the social & behavioral sciences* (2nd ed.) (pp. 718-721). Oxford: Elsevier.

French, K., Dumani, S., Allen, T., & Shockley, K. (2018). A meta-analysis of work-family conflict and social support. *Psychological Bulletin, 144*, 284-314.

Freshwater, D., & Cahill, J. (2010). Care and compromise: Developing a conceptual framework for work-related stress. *Journal of Research in Nursing, 15*(2), 173-183.

Gagnon, A., Meier, K., & Waghorn, K. (2007). Continuity of nursing care and its link to cesarean birth rate. *Birth, 34,* 26-31.

Gelsema, T., Doef, M., Maes, S., Akerboom, S., & Verhoeven, C. (2005). Job stress in the nursing profession: The influence of organizational and environmental conditions and job characteristics, *International Journal of Stress Management, 12*(3), 222-240.

Geraghty, S., Speelman, C., & Bayes, S. (2019). Fighting a losing battle: Midwives experiences of workplace stress. *Women Birth, 32(3)*, 297-306.

Gheshlagh, R., Parizad, N., Dalvand, S., Zarei, M., Farajzadeh, M., Karami, M., & Sayehmiri, K. (2017). The prevalence of job stress among nurses in Iran: A meta-analysis study. *Nursing and Midwifery Studies, 6*(4), 143-148.

Glazer, S., & Kruse, B. (2008). The role of organizational commitment in occupational stress models. *International Journal of Stress Management, 15*, 329-344.

Golubic, R., Milosevic, M., Knezevic, B., & Mustajbegović, J. (2009). Work-related stress, education and work ability among hospital nurses. *Journal of Advanced Nursing 65*, 2056-2066.

Government, G. (1997). *The professional nursing and midwifery act. B.E. 2528 (1985) as amended by the professional nursing and midwifery Act. B.E. 2540 (1997).* Retrieved from http://www.ThaiLaws.com

Gray, J., Grove, S. K., & Sutherland, S. (2017). *Burns and Grove's the practice of nursing research: Appraisal, synthesis, and generation of evidence* (8th ed.). Amsterdam: Elsevier.

Grech, L. M., & Hili, C. (2019). Midwives' perceptions of work related stress in midwifery in Malta. *Malta Journal of Health Sciences, 6*(2), 16-23

Griffin, M., & Clarke, S. (2011). Stress and well-being at work. *APA Handbook of Industrial and Organizational Psychology, 3*, 359-397.

Guo, J., Chen, J., Fu, J., Ge, X., Chen, M., & Liu, Y. (2016). Structural empowerment, job stress and burnout of nurses in China. *Applied Nursing Research, 31*, 41-45.

Hackman, J. R., & Lawler, E. E. (1971). Employee reactions to job characteristics. *Journal of Applied Psychology, 55*(3), 259-286.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Upper Saddle River: Prentice Hall.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.), Andover, Hampshire, United Kingdom: Cengage.

Hair, J., Black, W., Babin, B., Anderson, R. E., & Tatham, R. (2006) *Multivariate data analysis* (6th ed.). Upper Saddle River: Prentice Hall.

Halbesleben, J., & Rotondo, D. (2007). Developing social support in employees: Human resource development lessons from same-career couples. *Advances in Developing Human Resources, 9*, 544-555.

Hämmig, O. (2017). Health and well-being at work: The key role of supervisor support. *SSM - Population Health*, *3*, 393-402.

Haque, A. (2014). *Relationship between occupational stress and career growth with organizational commitment among nurses of a medical college hospital, Bangladesh.* Master's thesis, Nursing, Graduate School, Burapha University.

Harris, K. J., & Kacmar, K. M. (2005). Easing the strain: The buffer role of supervisors in the perceptions of politics-strain relationship. *Journal of Occupational and Organizational Psychology, 78*(3), 337-354.

Hassard, J., Teoh, K., Visockaite, G., Dewe, P., & Cox, T. (2017). The cost of work-related stress: A systematic review. *Journal of Occupational Health Psychology, 23*, 1-17.

Hasselhorn, H. M., Tackenberg, P., & Müller, B. H. (2003). *Working conditions and intent to leave the profession among nursing staff in Europe.* Stockholm: SALTSA.

Healy, S., Humphreys, E., & Kennedy, C. (2016). Midwives' and obstetricians' perceptions of risk and its impact on clinical practice and decision-making in labour: An integrative review. *Women Birth, 29*(2), 107-116.

Hildingsson, I., Westlund, K., & Wiklund, I. (2013). Burnout in Swedish midwives. *Sexual & Reproductive Healthcare, 4*(3), 87-91.

Holman, D. J., & Wall, T. D. (2002). Work characteristics, learning-related outcomes, and strain: A test of competing direct effects, mediated, and moderated models. *Journal of Occupational Health Psychology, 7*(4), 283-301.

Hsieh, T. H. (2004). The relationship between employees' personal work standards and perceived work stress. *International Journal of Stress Management, 11*(2), 177-187.

International Labour Organization [ILO]. (2016). *Workplace stress: A collective challenge*. Geneva: International Labour Organization.

Jamal, M. (2007). Job stress and job performance controversy revisited: An empirical examination in two countries. *International Journal of Stress Management, 14*, 175-187.

Jamal, M., & Baba, V. (2000). Job stress and burnout among Canadian managers and nurses: An empirical examination. *Canadian Journal of Public Health, 91*, 454-458.

Jampong, P. (2016). *The moderating effect of optimistic and work family conflict on the relationships between job demand and job stress.* Master's thesis, Liberal arts, Graduate School, Thammasat University.

Jirapongsuwan, A., Likitpornswan, O., Triamchaisri, S., & Chandanasotthi, P. (2011). Job strain and family well-being among public health nurses in bangkok metropolitan administration, Thailand. *Asia-Pacific Journal of Public Health/ Asia-Pacific Academic Consortium for Public Health, 24*, 556-564.

Johan, S., Sarwar, H., & Majeed, I. (2017). To identify the causes of stress among nurses working in intensive care unit of ittefaq hospital lahore. *International Journal of Social Sciences and Management, 4*, 96.

Johnson, J. V., & Hall, E. M. (1988). Job strain, work place social support, and cardiovascular disease: A cross-sectional study of a random sample of the Swedish working population. *American Journal of Public Health, 78*(10), 1336-1342.

Jolly, P. M., Kong, D. T., & Kim, K. Y. (2020). Social support at work: An integrative review. *Journal of Organizational Behavior*, *42*(2), 229-251.

Jordan, T. R., Khubchandani, J., & Wiblishauser, M. (2016). The impact of perceived stress and coping adequacy on the health of nurses: A pilot investigation. *Nursing Research and Practice*, *10,* 1-11. doi.org/10.1155/2016/5843256

Kaewboonchoo, O., Yingyuad, B., Rawiworrakul, T., & Jinayon, A. (2014). Job stress and intent to stay at work among registered female nurses working in Thai hospitals. *Journal of Occupational Health, 56*(2), 93-99.

Karami, A., Farokhzadian, J., & Foroughameri, G. (2017). Nurses' professional competency and organizational commitment: Is it important for human resource management? *PLoS One*, *12*(11), e0187863. https://doi.org/10.1371/journal.pone.0187863

Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly, 24*(2), 285-308.

Karasek, R. A. (1985). *Job content instrument: Questionnaire and user's guide*. Los Angeles: University of southern Carifora.

Karasek, R. A., & Theorell, T. (1990). *Healthy work: Stress, productivity, and the reconstruction of working life*. New York: Basic Books.

Karasek, R. A., Triantis, K., & Chaudhry, S. (1982). Coworker and supervisor support as moderators of associations between task characteristics and mental strain. *Journal of Organizational Behavior, 3*(2), 181-200.

Karasek, R., Brisson, C., Kawakami, N., Houtman, I., Bongers, P., & Amick, B. (1998). The job content questionnaire (JCQ): An instrument for internationally comparative assessments of psychosocial job characteristics. *Journal of Occupational Health Psychology, 3*, 322-355.

Keykaleh, M. S., Safarpour, H., Yousefian, S., Faghisolouk, F., Mohammadi, E., & Ghomian, Z. (2018). The relationship between nurse's job stress and patient Safety. *Journal Of Medical Sciences, 6*(11), 2228-2232.

Kikuchi, Y., Nakaya, M., Ikeda, M., Okuzumi, S., Takeda, M., & Nishi, M. (2014). Relationship between job stress, temperament and depressive symptoms in female nurses. *International Journal of Occupational Medicine and Environmental Health, 27*(3), 426-434.

Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). New York, NY, US: Guilford Press.

Kline, R. B. (2015). *Principles and practice of structural equation modeling* (4th ed.). New York: Guilford Publications.

Knezevic, B., Milosevic, M., Golubic, R., Belosevic, L., Russo, A., & Mustajbegovic, J. (2011). Work-related stress and work ability among Croatian university hospital midwives. *Midwifery, 27*(2), 146-153.

Kokoroko, E., & Sanda, M. A. (2019). Effect of workload on job stress of Ghanaian OPD nurses: The role of coworker support. *Safety and Health at Work*, *10*(3), 341-346.

Kool, L. E., Schellevis, F. G., Jaarsma, D. A. D. C., & Feijen-De Jong, E. I. (2020). The initiation of Dutch newly qualified hospital-based midwives in practice: A qualitative study. *Midwifery, 83*, 102648.

Kordi, M., Mohamadirizi, S., Shakeri, M. T., Modares Gharavi, M., & Salehi Fadardi, J. (2014). The relationship between occupational stress and work ability among midwives in Mashhad, Iran. *Journal of Midwifery and Reproductive Health, 2*(3), 188-194.

Koutsimani, P., Montgomery, A., & Georganta, K. (2019). The relationship between burnout, depression, and anxiety: A systematic review and meta-analysis. *Frontiers in Psychology*, *10*(284), 1-19. doi.org/10.3389/fpsyg.2019.00284

Kubicek, B., Korunka, C., & Tement, S. (2014). Too much job control? Two studies on curvilinear relations between job control and eldercare workers' well-being. *International Journal of Nursing Studies*, *51*(12), 1644-1653.

Kumar, A., Pore, P., Gupta, S., & Wani, A. O. (2016). Level of stress and its determinants among intensive care unit staff. *Indian Journal of Occupational and Environmental Medicine, 20*(3), 129-132.

Kunsiripunyo, J. (2019). Nurse's roles in intrapartum fetal surveillance using the
continuous cardiotocography. *Journal of Phrapokklao Nursing College, 30*(1),
226-238.

Leiter, M., Gascón, S., & Martínez-Jarreta, B. (2010). Making sense of work life:
A structural model of burnout. *Journal of Applied Social Psychology, 40*, 57-
75.

Liblub, S., Gum, L., & Bazargan, M. (2020). How do pregnant women perceive the role
of the midwife in Thailand? A descriptive study. *Journal of Asian Midwives*,
*7*(2), 33-47.

Lindholm, M. (2006). Working conditions, psychosocial resources and work stress in
nurses and physicians in chief managers' positions. *Journal Nursiing
Management, 14*, 300-309.

Lo, W.-Y., Chien, L.-Y., Hwang, F.-M., Huang, N., & Chiou, S.-T. (2017). From job
stress to intention to leave among hospital nurses: A structural equation
modelling approach. *The Journal of Advanced Nursing*, *74*(3), 677-688.

Lu, D. M., Sun, N., Hong, S., Fan, Y. Y., Kong, F. Y., & Li, Q. J. (2015). Occupational
stress and coping strategies among emergency department nurses of China.
*Archives of Psychiatric Nursing, 29*(4), 208-212.

Maharaj, S., Lees, T., & Lal, S. (2018). Prevalence and risk factors of depression,
anxiety, and stress in a cohort of Australian nurses. *International Journal of
Environmental Research and Public Health, 16*(1), 61.

Malhi, L. D., Akkadechnunt, T., & Sirakamon, S. (2016). Job stress and presenteeism
among nurses in tertiary care hospitals, the Islamic Republic of Pakistan.
*Nursing Journal, 46*, 104-115.

Maneerung, N., & Bauthong, N. (2016). Occupation stress and personality among
registered nurses of a private hospital. *Chulalongkorn Medical Journal, 60*(6),
667-687.

Marcelissen, F. H., Winnubst, J. A., Buunk, B., & de Wolff, C. J. (1988). Social support
and occupational stress: A causal analysis. *Social Science & Medicine, 26*(3),
365-373.

Mayerl, H., Stolz, E., Waxenegger, A., Rásky, É., & Freidl, W. (2016). The role of personal and job resources in the relationship between psychosocial job demands, mental strain, and health problems. *Frontiers in Psychology*, *7*, 1214. https://doi.org/10.3389/fpsyg.2016.01214

McVicar, A. (2003). Workplace stress in nursing: A literature Review. *Journal of Advanced Nursing, 44*, 633-642.

Mensah, A. (2021). Job stress and mental well-being among working men and women in Europe: The mediating role of social support. *International Journal of Environmental Research and Public Health*, *18*(5), 2494-2511.

Michie, S., & Williams, S. (2003). Reducing work related psychological ill health and sickness absence: A systematic literature review. *Occupational and Environmental Medicine, 60*(1), 3-9.

Moayed, M. S., Mahmoudi, H., Ebadi, A., & Sharif Nia, H. (2016). Stress and fear of exposure to sharps in nurses. *Iranian Journal of Psychiatry and Behavioral Sciences, 10*(3), 3813-3813.

Montgomery, A., Spânu, F., Băban, A., & Panagopoulou, E. (2015). Job demands, burnout, and engagement among nurses: A multi-level analysis of ORCAB data investigating the moderating effect of teamwork. *Burnout Research, 2*(2), 71-79.

Mosadeghrad, A. M. (2014). Occupational stress and its consequences: Implications for health policy and management. *Leadership in Health Services, 27*(3), 224-239.

Nabirye, R. C. (2010). *Occupational stress, job satisfaction and job performance among hospital nurses in Kampala Uganda*. Doctoral dissertation, Nursing, School of Health Sciences, Makerere University.

Nagami, M., Tsutsumi, A., Tsuchiya, M., & Morimoto, K. (2010). Job control and coworker support improve employee job performance. *Industrial Health, 48*(6), 845-851.

Najimi, A., Goudarzi, A. M., & Sharifirad, G. (2012). Causes of job stress in nurses: A cross-sectional study. *Iranian Journal of Nursing and Midwifery Research, 17*(4), 301-305.

Nakakis, K., & Ouzouni, C. (2008). Factors influencing stress and job satisfaction of

    nurses working in psychiatric units: A research review. *Health Science Journal,*

    *2*(4), 183-195.

Nantsupawat, A., Nantsupawat, R., Kunaviktikul, W., Turale, S., & Poghosyan, L.

    (2016). Nurse burnout, nurse-reported quality of care, and patient outcomes in

    Thai hospitals. *Journal of Nursing Scholarship: An Official Publication of*

    *Sigma Theta Tau International Honor Society of Nursing, 48*(1), 83-90.

Narban, D. J. S., Narban, B. P. S., & Singh, J. (2016). A conceptual study on

    occupational stress (Job stress/ work stress) and its impacts. *Internation*

    *Journal of Advance Research and Innovative Ideas in Education, 2*(1), 47-56.

Nasurdin, A., Quah, C., & Lim, C. (2006). *Job demands and stress: Does control*

    *matter?*. Retrieved from https://www.researchgate.net/profile/Chun-

    Quah/publication/259572191_JOB_DEMANDS_AND_STRESS_DOES_CO

    NTROL_MATTER/links/0046352ca27f2ca072000000/JOB-DEMANDS-

    AND-STRESS-DOES-CONTROL-MATTER.pdf

National Statistical Office of Thailand. (2020). *Thailand multiple indicator cluster*

    *survey 2019, survey findings report*. Bangkok: National Statistical.

Navajas-Romero, V., Ariza-Montes, A., & Hernández-Perlines, F. (2020). Analyzing

    the job demands-control-support model in work-life balance: A study among

    nurses in the European context. *International Journal of Environmental*

    *Research and Public Health*, *17*(8), 2847-2863.

National Institute for Occupational Safety and Health [NIOSH]. (1999). *Stress at work*

    (Vol. 99-101). USA: DHHS (NIOSH) Publication.

Nixon, A., Mazzola, J., Bauer, J., R. Krueger, J., & Spector, P. (2011). Can work make

    you sick? A meta-analysis of the relationships between job stressors and

    physical symptoms. *Work & Stress, 25*, 1-22.

Nowrouzi, B., Lightfoot, N., Carter, L., Larivère, M., Rukholm, E., & Belanger-

    Gardner, D. (2015a). Workplace system factors of obstetric nurses in

    Northeastern Ontario, Canada: Using a work disability prevention approach.

    *Safety and Health at Work, 6*(4), 305-311.

Nowrouzi, B., Lightfoot, N., Carter, L., Lariviere, M., Rukholm, E., & Belanger-Gardner, D. (2015b). A qualitative study of the work environment in obstetrical nursing in northeastern Ontario, Canada. *Journal of Nursing Education and Practice, 5*, 10-22.

Pal, S., & Saksvik, P. (2008). Work-family conflict and psychosocial work environment stressors as predictors of job stress in a cross-cultural study. *International Journal of Stress Management, 15,* 22-42.

Park, S., Kang, H. S., & Kim, E. J. (2018). The role of supervisor support on employees' training and job performance: An empirical study. *European Journal of Training and Development, 42*, 57-74.

Park, Y. M., & Kim, S. Y. (2013). Impacts of job stress and cognitive failure on patient safety incidents among hospital nurses. *Safety and Health at Work, 4*(4), 210-215.

Parker, D. F., & DeCotiis, T. A. (1983). Organizational determinants of job stress. *Organizational Behavior and Human Performance, 32*(2), 160-177.

Pender, N., Murdaugh, C., & Parsons, M. A. (2011). *Health promotion in nursing practice*. Boston: Pearson education international.

Pengjam, J. (2016). *Factors associated with job stress among sleep technicians of Thailand.* Master's thesis, Public Health, Faculty of Liberal Arts, Krirk University, Bangkok.

Peyman, A., Nayeri, N. D., Bandboni, M. E., & Moghadam, Z. B. (2019). Legal complaints about midwives and the impact on the profession. *Nursing Ethics*, *26*(1), 148-160.

Pezaro, S., Clyne, W., & Fulton, E. A. (2017). A systematic mixed-methods review of interventions, outcomes and experiences for midwives and student midwives in work-related psychological distress. *Midwifery, 50*, 163-173.

Pezaro, S., Clyne, W., Turner, A., Fulton, E. A., & Gerada, C. (2016). Midwives Overboard: Inside their hearts are breaking, their makeup may be flaking but their smile still stays on. *Women Birth, 29*(3), e59-66.

Phakthongsuk, P. (2009). Construct validity of the Thai version of the job content questionnaire in a large population of heterogeneous occupations. *Journal of the Medical Association of Thailand, 92*(4), 564-572.

Phakthongsuk, P., & Apakupakul, N. (2008). Psychometric properties of the Thai version of the 22-item and 45-item Karasek job content questionnaire. *International Journal of Occupational Medicine and Environmental Health, 21*(4), 331-344.

Pisanti, R., van der Doef, M., Maes, S., Lazzari, D., & Bertini, M. (2011). Job characteristics, organizational conditions, and distress/ well-being among Italian and Dutch nurses: A cross-national comparison. *International Journal of Nursing Studies, 48*(7), 829-837.

Polit, D. F., & Beck, C. T. (2012). *Nursing research: Generating and assessing evidence for nursing practice* (9th ed.). Philadelphia: Lippincott, Williams & Wilkins.

Prapawichar, P., Ratinthorn, A., Utriyaprasit, K., & Viwatwongkasem, C. (2020). Maternal and health service predictors of postpartum hemorrhage across 14 district, general and regional hospitals in Thailand. *BMC Pregnancy and Childbirth*, *20*, 1-12.

Puenpatom, R. A., & Rosenman, R. (2008). Efficiency of Thai provincial public hospitals during the introduction of universal health coverage using capitation. *Health Care Management Science*, *11*(4), 319-338.

Roberts, R., & Grubb, P. L. (2014). The consequences of nursing stress and need for integrated solutions. *Rehabilitation Nursing: The Official Journal of the Association of Rehabilitation Nurses, 39*(2), 62-69.

Roberts, R., Grubb, P. L., & Grosch, J. W. (2012). *Alleviating job stress in nurses.* Retrieved from https://www.medscape.com/viewarticle/765974

Russell, H., Maitre, B., Watson, D., & Fahey, É. (2018). *Job stress and working conditions: Ireland in comparative perspective*. Retrieved from https://www. esri.ie/system/files/publications/RS84_0.pdf

Saijo, Y., Yoshioka, E., Kawanishi, Y., Nakagi, Y., Itoh, T., & Yoshida, T. (2016). Relationships of job demand, job control, and social support on intention to leave and depressive symptoms in Japanese nurses. *Industrial Health, 54*(1), 32-41.

Sarafis, P., Rousaki, E., Tsounis, A., Malliarou, M., Lahana, L., Bamidis, P., & Papastavrou, E. (2016). The impact of occupational stress on nurses' caring behaviors and their health related quality of life. *BMC Nursing, 15*, 56-56.

Sathira-Angkura, T., Jamsomboon, K., Wongsuvansiri, S., Leelawong, S., & Boonkaew, H. (2019). Development of nursing manpower management model for patient safety: A pilot study in Ratchaburi province *Journal of Health Science*, *28*(6), 1130-1142.

Schumacker, R. E., & Lomax, R. G. (2010). *A beginner's guide to structural equation modeling* (3rd ed.). New York: Routledge/ Taylor & Francis Group.

Shahzad, M. B. (2019). Psychological capital as a moderator in the relationship between job autonomy and job stress: The case of Pakistan financial services firms. *Management, 18*(4), 614-633.

Shanock, L., & Eisenberger, R. (2006). When supervisors feel supported: Relationships with subordinates' perceived supervisor support, perceived organizational support, and performance. *The Journal of Applied Psychology, 91*(3), 689-695.

Sharma, P., Davey, A., Davey, S., Shukla, A., Shrivastava, K., & Bansal, R. (2014). Occupational stress among staff nurses: Controlling the risk to health. *Indian Journal of Occupational and Environmental Medicine, 18*(2), 52-56.

Shin, S. Y., & Lee, S. G. (2016). Effects of hospital workers' friendship networks on job stress. *PLoS One, 11*(2). e0149428.

Shohani, M., Rasouli, M., & Sahebi, A. (2018). The level of professional autonomy in iranian nurses. *Journal of Clinical and Diagnostic Research*, *12*(5), LC01-LC04.

Simpson, K. R. (2005). The context & clinical evidence for common nursing practices during labor. *The American Journal of Maternal Child Nursing, 30*(6), 356-363.

Somers, M., Birnbaum, D., & Casal, J. (2021). Supervisor support, control over work methods and employee well-being: New insights into nonlinearity from artificial neural networks. *The International Journal of Human Resource Management, 32*, 1620-1642.

Stansfeld, S., & Candy, B. (2006). Psychosocial work environment and mental health-- A meta-analytic review. *Scandinavian Journal of Work, Environment & Health, 32*(6), 443-462.

Starc, J. (2018). Stress factors among nurses at the primary and secondary level of public sector health care: The case of Slovenia. *Journal of Medical Sciences, 6*(2), 416-422.

Stichler, J. F., Feiler, J. L., & Chase, K. (2012). Understanding risks of workplace injury in labor and delivery. *Journal of Obstetric, Gynecologic & Neonatal Nursing, 41*(1), 71-81.

Stoll, K., & Gallagher, J. (2019). A survey of burnout and intentions to leave the profession among Western Canadian midwives. *Women and Birth: Journal of the Australian College of Midwives, 32*(4), 441-449.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston: Allyn & Bacon/ Pearson Education.

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Boston: Pearson Education.

Teng, C. I., Hsiao, F. J., & Chou, T. A. (2010). Nurse-perceived time pressure and patient-perceived care quality. *Journal Nursing Management, 18*(3), 275-284.

Thadakant, S., & Kritsupalerk, W. (2009). Thai women's belief on roles of nurse-midwives working with pregnant women in antenatal, intranatal and postnatal units. *Ramathibodi Medical Journal*, *32*(1), 21-31.

Thadakant, S., West, S., Allnutt, J., & Boontong, T. (2009). Professional identity as midwives of thai nurse-midwives whose work involve midwifery practice. *Ramathibodi Medical Journal, 32*(4), 187-197.

Thailand Nursing Council and Midwifery. (2021). *Restrictions and conditions of nursing and midwifery profession, B.E. 2564 (2021).* Retrieved from https://www.tnmc.or.th/images/userfiles/files/T_0028.PDF

Thangthum, W., Kalampakorn, S., & Lagampan, S. (2014). Factors predicting job strain among male nurses in Thailand. *Journal of Nursing Division, 41*(2), 6-22.

Theorell, T., & Karasek, R. A. (1996). Current issues relating to psychosocial job strain and cardiovascular disease research. *Journal of Occupational Health Psychology, 1*(1), 9-26.

The American College of Obstetricians and Gynecologists [ACOG]. (2014). Preparing for clinical emergencies in obstetrics and gynecology: Committee opinion No. 590. *Obstetrics & Gynecology, 590*(123), 722-725.

Theorell, T., Hammarström, A., Gustafsson, P. E., Magnusson Hanson, L., Janlert, U., & Westerlund, H. (2014). Job strain and depressive symptoms in men and women: A prospective study of the working population in Sweden. *Journal of Epidemiology and Community Health*, *68*(1), 78-82.

Thrathip, K., & Chantima, C. (2015). *Born too soon: Thailand action report: Thai maternal and child health network project under the patronage of HRH princess srirasmi, the royal consort of HRH crown prince Maha Vajiralongkorn, 2006-2014*. Bangkok: Advanced Printing Service.

Toohey, J. (1995). Managing the stress phenomenon at work. In *Psychological health in the workplace: Understanding & managing occupational stress.* (pp. 51-71). Carlton South VIC, Australia: Australian Psychological Society.

Trousselard, M., Dutheil, F., Naughton, G., Cosserant, S., Amadon, S., Duale, C., & Schoeffler, P. (2016). Stress among nurses working in emergency, anesthesiology and intensive care units depends on qualification: A job demand-control survey. *International Archives of Occupational and Environmental Health, 89*(2), 221-229.

Van Bogaert, P., Timmermans, O., Weeks, S. M., van Heusden, D., Wouters, K., & Franck, E. (2014). Nursing unit teams matter: Impact of unit-level nurse practice environment, nurse work characteristics, and burnout on nurse reported job outcomes, and quality of care, and patient adverse events: A cross-sectional survey. *International Journal of Nursing Studies, 51*(8), 1123-1134.

Van den Tooren, M., & de Jonge, J. (2010). The role of matching job resources in different demanding situations at work: A vignette study. *Journal of Occupational and Organizational Psychology, 83*(1), 39-54.

Van Der Doef, M., & Maes, S. (1999). The job demand-control (-support) model and psychological well-being: A review of 20 years of empirical research. *Work & Stress, 13*(2), 87-114.

Van der Heijden, B., Kümmerling, A., van Dam, K., Schoot, E., Estryn-Behar, D., & Hasselhorn, H. (2009). The impact of social support upon intention to leave among female nurses in Europe: Secondary analysis of data from the NEXT survey. *International Journal of Nursing Studies, 47*, 434-445.

Vera, M., Martínez, I. M., Lorente, L., Chambel, M. J. (2015). The role of co-worker and supervisor support in the relationship between job autonomy and work engagement among Portuguese nurses: A multilevel study. *Social Indicators Research, 126*, 1143-1156.

Viertiö, S., Kiviruusu, O., Piirtola, M., Kaprio, J., Korhonen, T., Marttunen, M., & Suvisaari, J. (2021). Factors contributing to psychological distress in the working population, with a special reference to gender difference. *BMC Public Health*, *21*(1), 611.doi.org/10.1186/s12889-021-10560-y

Viotti, S., & Converso, D. (2016). Relationship between job demands and psychological outcomes among nurses: Does skill discretion matter? *International Journal of Occupational Medicine and Environmental Health*, *29*(3), 439-460.

Wallbank, S., & Robertson, N. (2013). Predictors of staff distress in response to professionally experienced miscarriage, stillbirth and neonatal loss: A questionnaire survey. *International Journal of Nursing Studies, 50*(8), 1090-1097.

Warr, P. (1994). A conceptual framework for the study of work and mental health. *Work and Stress, 8*(2), 84-97.

Wattanakitkrileart, D., Naksawasdi, K., Cheewapoonphon, C., & Sattayawiwat, W. (2010). Stress management and stress related factors in nurse. *Journal of Nursing Science, 28*(1), 64-75.

Wazqar, D., Kerr, M., Regan, S., & Orchard, C. (2017). An integrative review of the influence of job strain and coping on nurses' work performance: Understanding the gaps in oncology nursing research. *International Journal of Nursing Sciences, 4*(4), 418-429.

World Health Organization [WHO]. (2013). *World health statistics 2013*. Geneva: World Health Organization.

Wu, S. (2012). Warranty data analysis: A review. *Quality and Reliability Engineering International, 28*(8), 795-805.

Yang, F., Liu, J., Huang, X., Qian, J., Wang, T., Wang, Z., & Yu, H. (2018). How supervisory support for career development relates to subordinate work engagement and career outcomes: The moderating role of task proficiency. *Human Resource Management Journal, 28*(3), 496-509.

Yoshizawa, K., Sugawara, N., Yasui-Furukori, N., Danjo, K., Furukori, H., Sato, Y., Tomita, T., Fujii, A., Nakagam, T., Sasaki, M., & Nakamura, K. (2016). Relationship between occupational stress and depression among psychiatric nurses in Japan. *Archives of Environmental & Occupational Health, 71*(1), 10-15.

Yu, J., Ren, X., Wang, Q., He, L., Wang, J., Jin, Y., Chen, Y., Wang, L., Nie, Z., Guo, D., & Yao, Y. (2014). The role of social support on occupational stress among hospital nurses. *International Journal of Clinical and Experimental Medicine, 7*(9), 3000-3004.

Yuenyong, S., Jirapaet, V., & O'Brien, B. (2008). Support from a close female relative in labour: The ideal maternity nursing intervention in Thailand. *Journal of the Medical Association of Thailand, 91*, 253-260.

Yulianti, P., & Rohmawati, I. M. (2020). The effects of job demands on burnout, and engagement with teamwork effectiveness as the moderation variable on a police resort at Tanjung Perak, Port Surabaya. *International Journal of Innovation Creativity and Change, 11*(9), 582-599.

Yuwanich, N., Akhavan, S., Nantsupawat, W., Martin, L., Elfström, M. L., & Sandborgh, M. (2018). Development and psychometric properties of the stressor scale for emergency nurses. *International Emergency Nursing, 39*, 77-88.

Zaki, A. (2017). Perceived nursing supervisor support and its relation to work engagement and turnover intention among staff nurses. *Egyptian Journal of Health Care,* 8(2),172-185.

**APPENDICES**

**APPENDIX A**

Institutional review board

## เอกสารรับรองผลการพิจารณาจริยธรรมการวิจัยในมนุษย์
## มหาวิทยาลัยบูรพา

---

คณะกรรมการพิจารณาจริยธรรมการวิจัยในมนุษย์  มหาวิทยาลัยบูรพา  ได้พิจารณาโครงการวิจัย

**รหัสโครงการวิจัย :** G-HS 003/2563
**โครงการวิจัยเรื่อง :** การทดสอบโมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อความเครียดในงานของพยาบาลห้องคลอด
**หัวหน้าโครงการวิจัย :** ร.ต.อ.หญิงศิรินทร์ทิพย์ บุญด้วยลาน
**หน่วยงานที่สังกัด :** นิสิตระดับบัณฑิตศึกษา คณะพยาบาลศาสตร์

      คณะกรรมการพิจารณาจริยธรรมการวิจัยในมนุษย์ มหาวิทยาลัยบูรพา ได้พิจารณาแล้วเห็นว่า โครงการวิจัย
ดังกล่าวเป็นไปตามหลักการของจริยธรรมการวิจัยในมนุษย์ โดยที่ผู้วิจัยเคารพสิทธิและศักดิ์ศรีในความเป็นมนุษย์ ไม่มีการ
ล่วงละเมิดสิทธิ สวัสดิภาพ และไม่ก่อให้เกิดภยันตรายแก่ตัวอย่างการวิจัยและผู้เข้าร่วมโครงการวิจัย
      จึงเห็นสมควรให้ดำเนินการวิจัยในขอบข่ายของโครงการวิจัยที่เสนอได้ (ดูตามเอกสารตรวจสอบ)

๑. แบบเสนอเพื่อขอรับการพิจารณาจริยธรรมการวิจัยในมนุษย์    ฉบับที่ ๒ วันที่ ๑๗ เดือน กุมภาพันธ์ พ.ศ. ๒๕๖๓
๒. เอกสารโครงการวิจัยฉบับภาษาไทย    ฉบับที่ ๑ วันที่ ๒๔ เดือน มกราคม พ.ศ. ๒๕๖๓
๓. เอกสารชี้แจงผู้เข้าร่วมโครงการวิจัย    ฉบับที่ ๒ วันที่ ๑๗ เดือน กุมภาพันธ์ พ.ศ. ๒๕๖๓
๔. เอกสารแสดงความยินยอมของผู้เข้าร่วมโครงการวิจัย    ฉบับที่ ๑ วันที่ ๒๔ เดือน มกราคม พ.ศ. ๒๕๖๓
๕. เอกสารแสดงรายละเอียดเครื่องมือที่ใช้ในการวิจัยซึ่งผ่านการพิจารณาจากผู้ทรงคุณวุฒิแล้ว หรือชุดที่ใช้เก็บข้อมูลจริง
    จากผู้เข้าร่วมโครงการวิจัย    ฉบับที่ ๑ วันที่ ๒๔ เดือน มกราคม พ.ศ. ๒๕๖๓
๖. เอกสารอื่น ๆ (ถ้ามี)    ฉบับที่ - วันที่ - เดือน    - พ.ศ. -

วันที่รับรอง : วันที่ ๖ เดือน มีนาคม พ.ศ. ๒๕๖๓
วันที่หมดอายุ : วันที่ ๕ เดือน มีนาคม พ.ศ. ๒๕๖๔

ลงนาม

(รองศาสตราจารย์ ดร.วิทวัส แจ้งเอี่ยม)
ประธานคณะกรรมการพิจารณาจริยธรรมการวิจัยในมนุษย์ มหาวิทยาลัยบูรพา
ชุดที่ ๑ (กลุ่มคลินิก/ วิทยาศาสตร์สุขภาพ/ วิทยาศาสตร์และเทคโนโลยี)

Ref. no.CR 0032.102/EC 724

Certificate of Approval

Ethics Committee in Human Research Chiangrai Prachanukroh Hospital

Title of Project          : The Effects of Job demands, Job control, and Job support on Job stress among Intrapartum Nurses: A Causal Model.

Protocol Number       : EC CRH 080/63 Ex

Principle Investigator  : Sirinthip      Boonduaylan

Institute                 : Faculty of Nursing, Burapha University.

Review Method          : Expedited Review

Document Reviewed   :

    1. Study protocol, Version 1 Date 05/05/2020
    2. Participant Information Sheet, Version 1.0 Date 15/05/2020
    3. Consent Form, Version= 1.0 Date 15/05/2020
    4. Case Record form, Version 1.0 Date 15/05/2020

Ethics Committee in Human Research Chiangrai Prachanukroh Hospital in ICH-GCP and ethical concern, reviewed the protocol and approved for implementation of the research mentioned above. Therefore Thai version of the protocol will be mainly conducted.

Duration of approval  : July 30, 2020 – July 29, 2021

Progress report        : 12 month

Issued date            : August  21  , 2020

..............................................
(JULLAPONG   ACHALAPONG, MD.)
Chairman, Ethical Committee

NO. 76/63

แบบรับรองการดำเนินการวิจัยในโรงพยาบาลลำปาง
คณะอนุกรรมการจริยธรรมการวิจัยเกี่ยวกับมนุษย์ โรงพยาบาลลำปาง

1.ชื่อโครงการวิจัย (ภาษาไทย)  การทดสอบโมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อความเครียดในงานของ
พยาบาลห้องคลอด
(ภาษาอังกฤษ)  The Effects of Job demands, Job control, and Job support on Job stress among
Intrapartum Nurses : A Causal Model

2.ชื่อหัวหน้าโครงการวิจัย          ร.ต.อ.หญิงศิรินทร์ทิพย์  บุญด้วยลาน
หน่วยงานที่สังกัด                    คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา
ชื่อผู้วิจัยร่วม                          รศ.ดร.จินตนา วัชรสินธุ์
หน่วยงานที่สังกัด                    คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา


ความคิดเห็นของคณะอนุกรรมการจริยธรรมการวิจัยเกี่ยวกับมนุษย์ โรงพยาบาลลำปาง
         ☑  อนุมัติ
         ☐  ไม่อนุมัติ  เหตุผล..

วันที่รับรอง 25  พฤษภาคม 2563 – 24 พฤษภาคม 2564




( พญ.กนกศรี  สมินทรปัญญา )
ประธานคณะอนุกรรมการจริยธรรมการวิจัยเกี่ยวกับมนุษย์
โรงพยาบาลลำปาง
วันที่   25  เดือน พฤษภาคม พ.ศ. 2563

**Uttaradit Hospital**
**Ministry of Public Health**
**Address 38 Jesda Bodin Road, Tait , Mueang District Uttaradit Thailand**
**Tel. 055-832-601 ext. 2157-2158**

## Certificate of Approval

The Research Ethics Committee of the Uttaradit Tertiary Hospital of the Ministry of Public Health Thailand, has approved the following study which is to be carried out in compliance with the International guidelines for human research protection as Declaration of Helsinki, The Belmont Report, CIOMS Guideline and International Conference on Harmonization in Good Clinical Practice (ICH-GCP)

**Study Title** : The Effects of Job Demands, Job Control, and Job Support on Job Stress among Intrapartum Nurses: A Causal Model

**Study Code** : 22/2020

**Study Center** : Faculty Nursinger, Burapha University

**Principal Investigator** : Pol. Capt. Sirinthip Boonduaylan

**Review Method** : Expedited Review

**Continuing Report** : At least once annually or submit the final report if finished

**Document Reviewed** : Proposal, Case Record Form, Submission form Ethical Review
Information sheet for research participant
Principal Investigator Curriculum vitae

Signature: Weravut Mingkuan.        Signature: Aryoot Pamarpa

(Weravut Mingkuan, M.D.)                (Dr.Aryoot Pamarapa)
**Head of Human Ethic Committee**          **Uttaradit Hospital Director**

Date of Approval        :  27  October  2019
Approval Expire Date    :  26  October  2020

**โรงพยาบาลสวรรค์ประชารักษ์**
**SAWANPRACHARAK HOSPITAL**

**แบบรายงานผลการพิจารณาจริยธรรมการวิจัยในคน**
**โรงพยาบาลสวรรค์ประชารักษ์**

เลขที่ ๕๘/๒๕๖๓

**ชื่อโครงการวิจัย** : การทดสอบโมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อความเครียดในงานของ
พยาบาลห้องคลอด

**ชื่อหัวหน้าโครงการ** : ร.ต.อ.หญิงศิรินทร์ทิพย์ บุญด้วยลาน

**หน่วยงานที่สังกัด** : มหาวิทยาลัยศรีนครินทรวิโรฒ

ผลการพิจารณาของคณะกรรมการจริยธรรมการวิจัยในคน โรงพยาบาลสวรรค์ประชารักษ์
คณะกรรมการฯ ได้พิจารณารายละเอียดโครงการวิจัยเรื่องดังกล่าวข้างต้นแล้วในประเด็นเกี่ยวกับ

๑) การเคารพในศักดิ์ศรี และสิทธิของมนุษย์ที่ใช้เป็นตัวอย่างการวิจัย

๒) วิธีการที่เหมาะสมในการได้รับความยินยอมจากกลุ่มตัวอย่างก่อนเข้าร่วมโครงการวิจัย รวมทั้ง
การปกป้องสิทธิประโยชน์และรักษาความลับของกลุ่มตัวอย่าง

๓) การดำเนินการวิจัยอย่างเหมาะสม เพื่อไม่ให้เกิดความเสียหายต่อสิ่งที่ศึกษาวิจัย

คณะกรรมการจริยธรรมการวิจัยในคนมีมติเห็นชอบ รับรองโครงการวิจัย

วันที่ ที่ให้การรับรอง ๒๕ กันยายน ๒๕๖๓

แพทย์หญิงกมลทิพย์ ประสพสุข
รองประธานคณะกรรมการจริยธรรมการวิจัยในคน

| | มาตรฐานการปฏิบัติงานจริยธรรมการวิจัยเกี่ยวกับมนุษย์<br>ชื่อหน่วยงานโรงพยาบาลบุรีรัมย์<br>กระทรวงสาธารณสุข | BR 04-01/01.0 |
|---|---|---|
| | แบบแจ้งผลพิจารณาจริยธรรมการวิจัย | เริ่มใช้ ๑๔ ม.ค.๖๒ |

# บันทึกข้อความ

ส่วนราชการ สำนักงานคณะกรรมการจริยธรรมการวิจัยเกี่ยวกับมนุษย์ โรงพยาบาลบุรีรัมย์ โทร. ๔๐๑๑,๔๗๐๕

ที่ บร.๐๐๓๒.๑๐๒.๑/ ๓๕ วันที่ ๕ สิงหาคม ๒๕๖๓

เรื่อง แจ้งผลการพิจารณาจริยธรรมการวิจัยในมนุษย์โรงพยาบาลบุรีรัมย์

เรียน ร.ต.อ.หญิงศิรินทร์ทิพย์ บุญด้วยลาน ผู้วิจัยหลัก

จากการประชุมคณะกรรมการจริยธรรมการวิจัยเกี่ยวกับมนุษย์ โรงพยาบาลบุรีรัมย์ ครั้งที่ ๔/๒๕๖๓ ในวันที่ ๑๕ กรกฎาคม ๒๕๖๓ ได้พิจารณางานวิจัยเรื่อง "การทดสอบโมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อ ความเครียดในงานของพยาบาลห้องคลอด (The Effective of Job demands, Job control, and Job support on Job stress among Intrapartum Nurses: A Causal Model)"

ผู้วิจัยหลัก ร.ต.อ.หญิงศิรินทร์ทิพย์ บุญด้วยลาน

คณะกรรมการมีมติเห็นชอบให้การรับรองจริยธรรมการวิจัย และเห็นสมควรให้ทำงานวิจัยดังกล่าวใน โรงพยาบาลบุรีรัมย์ได้ โดยคณะกรรมการมีความเห็นให้ผู้วิจัยส่งรายงานความก้าวหน้าอย่างน้อย ปีละ ๑ ครั้ง หรือส่งรายงานฉบับสมบูรณ์หากดำเนินโครงการเสร็จสิ้นก่อน ๑ ปี

จึงเรียนมาเพื่อโปรดทราบ

(นางสาวพัชรี ยิ้มรัตนบวร)
ประธานคณะกรรมการจริยธรรมการวิจัยเกี่ยวกับมนุษย์

"ซับผิดชอบ สวมัคคี มีคุณธรรม"

โรงพยาบาลสุรินทร์
68 ถนนหลักเมือง ตำบลในเมือง
อำเภอเมือง จังหวัดสุรินทร์ 32000

เอกสารรับรองโครงการวิจัย

โดย

คณะกรรมการจริยธรรมการวิจัยในมนุษย์ องค์กรแพทย์ โรงพยาบาลสุรินทร์

เลขที่หนังสือรับรอง .........34 / 2563............................

| ชื่อโครงการ/ภาษาไทย | การทดสอบโมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อความเครียดในงานของพยาบาลห้องคลอด |
|---|---|
| ชื่อโครงการ/ภาษาอังกฤษ | The Effects of Job demands, Job control, and Job support on Job stress among Intrapartum Nurses : A Causal Model. |
| ชื่อหัวหน้าโครงการ/หน่วยงานที่สังกัด | ร.ต.อ.หญิงศิรินทร์ทิพย์ บุญด้วยลาน คณะพยาบาลศาสตร์ มหาวิทยาลัยศรีนครินทรวิโรฒ |
| รหัสโครงการ | - |
| สถานที่ทำการวิจัย | โรงพยาบาลสุรินทร์ |
| เอกสารรับรอง | -แบบเสนอโครงการวิจัยเพื่อขอรับการพิจารณา  -หนังสือให้ความยินยอมเข้าร่วมโครงการ  -แบบบันทึกข้อมูล |
| รับรองโดย | คณะกรรมการจริยธรรมการวิจัยในมนุษย์ องค์กรแพทย์ โรงพยาบาลสุรินทร์ |
| วันที่รับรอง | 05 มิถุนายน 2563 |
| วันหมดอายุ | 04 มิถุนายน 2564 |

หนังสือรับรองฉบับนี้ออกโดยความเห็นชอบในการพิจารณาจากคณะกรรมการจริยธรรมการวิจัยในมนุษย์ องค์กรแพทย์ โรงพยาบาลสุรินทร์ ตามเกณฑ์สากล (ICH-GCP)

.................................................

(นางอุษณีย์ สุขนิตย์)
เลขานุการคณะกรรมการจริยธรรมการวิจัยในมนุษย์
โรงพยาบาลสุรินทร์

.................................................

(นายฐูสิทธิ์ พานิชวิทิตกุล)
ประธานคณะกรรมการจริยธรรมการวิจัยในมนุษย์
โรงพยาบาลสุรินทร์

UDH REC No.33/2563

**คณะกรรมการจริยธรรมการวิจัยในมนุษย์**
**โรงพยาบาลอุดรธานี**
**33 ถ.เพาะนิยม ต.หมากแข้ง อ.เมือง จ.อุดรธานี 41000 โทร. 0 4224 5555 ต่อ 3421**

เอกสารรับรองโครงการวิจัย

คณะกรรมการจริยธรรมการวิจัยในมนุษย์โรงพยาบาลอุดรธานี ดำเนินการให้การรับรองโครงการวิจัยตาม
แนวทางหลักจริยธรรมการวิจัยในมนุษย์ที่เป็นมาตรฐานสากลได้แก่ Declaration of Helsinki, The Belmont Report,
CIOMS Guideline และ International Conference on Harmonization in Good Clinical Practice หรือ ICH-GCP

| | |
|---|---|
| **ชื่อโครงการ :** | การทดสอบโมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อความเครียดในงานของพยาบาลห้องคลอด (The Effects of Job demands, Job control, and Job support on Job stress among Intrapartum Nurses: A Causal Model) |
| **เลขที่โครงการวิจัย :** | E040/2563 |
| **ผู้วิจัยหลัก :** | ร.ต.อ.หญิงศิรินทร์ทิพย์  บุญด้วยลาน |
| **ผู้ร่วมวิจัย :** | - |
| **สังกัดหน่วยงาน :** | มหาวิทยาลัยบูรพา |
| **วิธีทบทวน :** | การพิจารณาแบบเร็ว (Expedited Review) |
| **รายงานความก้าวหน้า :** | ส่งรายงานความก้าวหน้าอย่างน้อย 1ครั้ง/ปี หรือ ส่งรายงานฉบับสมบูรณ์หากดำเนิน โครงการเสร็จสิ้นก่อน 1 ปี |
| **เอกสารรับรอง :** | 1. แบบเสนอโครงการวิจัยเพื่อรับการพิจารณาจริยธรรมการทำวิจัยในมนุษย์ โรงพยาบาลอุดรธานี |
| | 2. ประวัติและความชำนาญของนักวิจัย |
| | 3. เอกสารชี้แจงผู้เข้าร่วมโครงการวิจัย (Participant Information Sheet) |
| | 4. เอกสารแสดงความยินยอมของผู้เข้าร่วมโครงการวิจัย (Consent Form) |
| | 5. แบบสอบถามการวิจัย |
| | 6. เอกสารรับรองโครงการวิจัย เลขที่ 004/2563 |

(นางสาวสุกัญญา ภัยหลีกลี้)
นายแพทย์เชี่ยวชาญ
ประธานคณะกรรมการจริยธรรมการวิจัยในมนุษย์ โรงพยาบาลอุดรธานี

**วันที่รับรอง: 23 มิถุนายน 2563        วันหมดอายุ: 22 มิถุนายน 2564**

ทั้งนี้ การรับรองนี้มีเงื่อนไขดังที่ระบุไว้ด้านหลังทุกข้อ (ดูด้านหลังของเอกสารรับรองโครงการวิจัย)

SKHREC27/2563

**โรงพยาบาลสกลนคร**
**หนังสือฉบับนี้ให้ไว้เพื่อแสดงว่า**

**โครงการวิจัยเรื่อง :** "การทดสอบโมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อความเครียดในงานของพยาบาล
ห้องคลอด"
"The Effects of Job demands, Job control, and Job support on Job stress
among Intrapartum Nurses: A Causal Model"

**ผู้วิจัย** : ร.ต.อ.หญิงศิรินทร์ทิพย์ บุญด้วยลาน
**หน่วยงาน :** คณะพยาบาลศาสตร์ มหาวิทยาลัยศรีนครินทรวิโรฒ

**สำหรับเอกสาร :**
1. แบบเสนอเพื่อขอรับการพิจารณาจริยธรรมการวิจัยในมนุษย์
2. แบบคำชี้แจงอาสาสมัคร และยินยอมอาสาสมัคร
3. โครงการวิจัยฉบับภาษาไทย
4. ประวัติผู้วิจัย
5. แบบเก็บข้อมูล (Data Collection Form)
6. เอกสารอ้างอิง

      ได้ผ่านการรับรองจากคณะกรรมการจริยธรรมการวิจัยในมนุษย์โรงพยาบาลสกลนคร โดยยึดหลักเกณฑ์
ตามคำประกาศเฮลชิงกิ (Declaration of Helsinki) โดยขอให้รายงานความก้าวหน้าของโครงการวิจัยทุก 6 เดือน

ให้ไว้ ณ วันที่ 26 มิถุนายน พ.ศ. 2563

(นายแพทย์สมพงษ์ อภิวัฒนกุล)
ประธานคณะกรรมการจริยธรรมการวิจัยในมนุษย์
โรงพยาบาลสกลนคร

หนังสือรับรองการพิจารณาจริยธรรมการวิจัยในมนุษย์ จังหวัดจันทบุรี/เขตสุขภาพที่ 6

สำนักงานคณะกรรมการพิจารณาจริยธรรมการวิจัยในมนุษย์ จังหวัดจันทบุรี/เขตสุขภาพที่ 6

โรงพยาบาลพระปกเกล้า อำเภอเมือง จังหวัดจันทบุรี

เอกสารรับรองเลขที่  CTIREC 044                                                                  วันที่  **29 พ.ค. 2563**

ชื่อโครงการวิจัยเรื่อง

การทดสอบโมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อความเครียดในงานของพยาบาลห้องคลอด

The Effects of Job demands, Job control, and Job support on Job stress among Intrapartum Nurses: A Causal Model

| เลขที่โครงการ | CTIREC 040/63 |
| --- | --- |
| ชื่อหัวหน้าโครงการ | ร.ต.อ.หญิงศิรินทร์ทิพย์  บุญด้วยลาน |
| หน่วยงานที่สังกัด | นิสิตระดับบัณฑิตศึกษา คณะพยาบาลศาสตร์ |
| วิธีการทบทวน | การพิจารณาโครงการวิจัยแบบเร่งด่วน |
| รายงานความคืบหน้า | เมื่อดำเนินการเสร็จสิ้นแต่ไม่เกิน 1 ปี |

เอกสารที่ได้การรับรอง

1. โครงร่างงานวิจัยเรื่อง การทดสอบโมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อความเครียดในงานของพยาบาลห้องคลอด Version 2  Date 29/05/63
2. แบบเอกสารชี้แจงข้อมูลสำหรับอาสาสมัคร (Participant information sheet) Version 2  Date 29/05/63
3. แบบเอกสารแสดงความยินยอมโดยได้รับการบอกกล่าว (Informed consent form) Version 2 Date 29/05/63
4. เครื่องมือที่ใช้ในการวิจัย
   - แบบสอบถามการวิจัย เรื่อง โมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อความเครียดในงานของพยาบาลห้องคลอด Version 2  Date 29/05/63
5. แบบอัตตประวัตินักวิจัย Version 1 Date 26/05/63

คณะกรรมการพิจารณาจริยธรรมการวิจัยในมนุษย์ จังหวัดจันทบุรี/เขตสุขภาพที่ 6 ขอรับรองว่าโครงการดังกล่าวข้างต้นได้ผ่านการพิจารณาเห็นชอบโดยสอดคล้องกับแนวทางที่เป็นมาตรฐานสากลได้แก่ Declaration of Helsinki, The Belmont Report, CIOMS Guideline และ International Conference on Harmonization in Good Clinical Practice  (ICH-GCP)

ลงนาม ...................................................

( ดร.พรทิพย์ สุขอดิศัย)

เลขานุการคณะกรรมการพิจารณาจริยธรรมการวิจัยในมนุษย์ จังหวัดจันทบุรี/เขตสุขภาพที่ 6

ลงนาม ...................................................

(นายแพทย์ธีรยุทธ นัมคณิสรณ์)

ประธานคณะกรรมการพิจารณาจริยธรรมการวิจัยในมนุษย์ จังหวัดจันทบุรี/เขตสุขภาพที่ 6

AF 05-09

COA No. RYH 014/2563

RYH REC No.E029/2563

คณะกรรมการจริยธรรมการวิจัยในมนุษย์ โรงพยาบาลระยอง

กระทรวงสาธารณสุข

ที่อยู่138 ถ.สุขุมวิท ต.ท่าประดู่ อ.เมือง จ.ระยอง โทร. 0-3861-1104 ต่อ 2240

## เอกสารรับรองโครงการวิจัยแบบเร็ว

คณะกรรมการจริยธรรมการวิจัยในมนุษย์ โรงพยาบาลระยอง ดำเนินการให้การรับรองโครงการวิจัยตามแนวทาง
หลักจริยธรรมการวิจัยในคนที่เป็นมาตรฐานสากลได้แก่ Declaration of Helsinki, The Belmont Report, CIOMS
Guideline และ International Conference on Harmonization in Good Clinical Practice หรือ ICH-GCP

| | |
|---|---|
| **ชื่อโครงการ** | : การทดสอบโมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อความเครียดในงานของพยาบาลห้องคลอด |
| | : The Effects of job demands, job control, and job support on job stress among Intrapartum Nurses; A Causal Model |
| **เลขที่โครงการวิจัย** | : RYH REC No.E029/2563 |
| **ผู้วิจัยหลัก** | : รตอ.ญ.ศิรินทร์ทิพย์ บุญด้วยลาน |
| **สังกัดหน่วยงาน** | : คณะพยาบาลศาสตร์ มหาวิทยาลัยศรีนครินทรวิโรฒ |
| **วิธีทบทวน** | : แบบเร็ว (Expedited review) |
| **รายงานความก้าวหน้า** | : ส่งรายงานความก้าวหน้าอย่างน้อย 1 ครั้ง/ปี หรือ ส่งรายงานฉบับสมบูรณ์โครงการเสร็จสิ้นก่อน 1 ปี |
| **เอกสารรับรอง** | : โครงร่างงานวิจัย , ตารางการเก็บข้อมูล |

ลงนาม .................................................

( นายสมบูรณ์ มะลิขาว )

ประธาน

คณะกรรมการจริยธรรมการวิจัยในมนุษย์

ลงนาม .................................................

(นางสุขดี เจียมอ่นกุลกิจ)

กรรมการและเลขานุการ

คณะกรรมการจริยธรรมการวิจัยในมนุษย์

**วันที่รับรอง** : 1 กันยายน 2563

**วันหมดอายุ** : 30 มิถุนายน 2564

ทั้งนี้ การรับรองนี้มีเงื่อนไขดังที่ระบุไว้ด้านหลังทุกข้อ (ดูด้านหลังของเอกสารรับรองโครงการวิจัย)

เอกสารเลขที่ ๑๖๔ / ๒๕๖๓                                      รหัสวิจัย ๑๐๕/๖๓/N/q

## ใบรับรองโครงการวิจัย
## โดย คณะกรรมการวิจัยและจริยธรรมการวิจัย โรงพยาบาลชลบุรี

.....................................

โครงการวิจัย          :          การทดสอบโมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อความเครียดในงาน
                                    ของพยาบาลห้องคลอด
                                    (The Effects of Job Demands, Job Control, and Job Support on
                                    Job Stress among Intrapartum Nurses: A Casual Model)
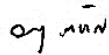
ผู้ดำเนินการวิจัยหลัก     :          ร้อยตำรวจเอกหญิงศิรินทร์ทิพย์ บุญด้วยลาน

หน่วยงานที่รับผิดชอบ     :          คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา
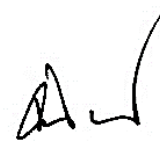
          คณะกรรมการวิจัยและจริยธรรมการวิจัย     โรงพยาบาลชลบุรี     ได้พิจารณาแล้วเห็นว่าสมควรให้
ดำเนินการวิจัยในขอบข่ายของโครงการวิจัยที่เสนอได้

          ลงนาม                                              ลงนาม



          (แพทย์หญิงวรนาฏ  รัตนากร)                          (แพทย์หญิงจิรวรรณ อารยะพงษ์)
          ประธานคณะกรรมการจริยธรรมวิจัย                      ผู้อำนวยการโรงพยาบาลชลบุรี
          วันที่รับรอง : ๑๗ พฤศจิกายน ๒๕๖๓                   วันหมดอายุ: ๑๗ พฤศจิกายน ๒๕๖๔

## เอกสารที่คณะกรรมการรับรอง

๑.  โครงการวิจัย

๒.  ข้อมูลสำหรับกลุ่มประชากรหรือผู้มีส่วนร่วมในการวิจัยและใบยินยอมของกลุ่มประชากรหรือผู้มีส่วนร่วม
     ในการวิจัย

๓.  ผู้วิจัย

๔.  แบบสอบถาม

๕.  ใบยินยอมเข้าร่วมงานวิจัยของอาสาสมัคร

## กำหนดการส่งรายงานความคืบหน้าการวิจัย
☐ทุก ๓ เดือน    ☐ทุก ๖ เดือน    ☑๑ ปี

                                                                        เงื่อนไข...

เอกสารรับรองโครงการวิจัย
โดย
คณะกรรมการพิจารณาการศึกษาวิจัยในคนโรงพยาบาลนครปฐม

COA No. 023 /2020

NPH - REC No. 023 /2020

| ชื่อโครงการ | การทดสอบโมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อความเครียดในงานของพยาบาลห้องคลอด |
|---|---|
| รหัสโครงการ | 023/2020 |
| ชื่อผู้วิจัยหลัก/. หน่วยงานที่สังกัด | ร.ต.อ.หญิงศิรินทร์ทิพย์ บุญด้วยลาน คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา |
| สถานที่ทำวิจัย | โรงพยาบาลนครปฐม |
| เอกสารที่รับรอง | 1. แบบเสนอโครงการวิจัยเพื่อขอรับการพิจารณารับรองจากคณะกรรมการพิจารณาการศึกษาวิจัยในคนโรงพยาบาลนครปฐม 2. เอกสารชี้แจงผู้เข้าร่วมการวิจัย 3. หนังสือแสดงเจตนายินยอมเข้าร่วมการวิจัย 4. แบบสอบถามการวิจัยโมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อความเครียดในงานของพยาบาลห้องคลอด |
| วิธีทบทวน | คณะกรรมการชุด Full Review Board |
| การรายงาน | ส่งรายงานความก้าวหน้าอย่างน้อย 1 ครั้ง / ปี หรือส่งรายงานฉบับสมบูรณ์หากดำเนินโครงการเสร็จสิ้นก่อน 1 ปี |
| รับรองโดย | คณะกรรมการพิจารณาการศึกษาวิจัยในคน โรงพยาบาลนครปฐม |
| วันที่รับรอง | 8 / 06 / 2020 |
| วันหมดอายุ | 8 / 06 / 2021 |

โครงการวิจัยได้ผ่านการพิจารณาและรับรองโดยคณะกรรมการพิจารณาการศึกษาวิจัยในคน โรงพยาบาลนครปฐม ตามแนวทางหลักจริยธรรมการวิจัยในมนุษย์ที่เป็นมาตรฐานสากลได้แก่ Declaration of Helsinki, The Belmont Report, CIOMS Guideline และ International Conference on Harmonization in Good Clinical Practice หรือ ICH-GCP

ลงนาม....................................
(แพทย์หญิงสุธัญญา บรรจงภาค)
ประธานคณะกรรมการพิจารณาการศึกษาวิจัยในคน
โรงพยาบาลนครปฐม

ลงนาม....................................
(นางอรอนงค์ เหล่าตระกูล)
กรรมการและเลขานุการ
คณะกรรมการพิจารณาการศึกษาวิจัยในคน
โรงพยาบาลนครปฐม

เอกสารรับรองจริยธรรมทางการวิจัย

เอกสารฉบับนี้ เพื่อแสดงว่า โครงการวิจัย
เรื่อง THE EFFECTS OF JOB DEMANDS, JOB CONTROL, AND JOB SUPPORT ON JOB STRESS
AMONG INTRAPARTUM NURSES : A CAUSAL MODEL

ผู้วิจัย คือ รตอ.ญ.ศิรินทิพย์ บุญด้วยลาน
หน่วยงาน คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา
ได้ผ่านการพิจารณาจากคณะกรรมการจริยธรรมการวิจัยในมนุษย์ โรงพยาบาลสุราษฎร์ธานีแล้ว และเห็นว่า
ผู้วิจัยต้องดำเนินการตามโครงการวิจัยที่ได้กำหนดไว้แล้ว หากมีการปรับเปลี่ยนหรือแก้ไขใด ๆ ควรผ่าน
ความเห็นชอบหรือแจ้งต่อคณะกรรมการจริยธรรมทางการวิจัยอีกครั้ง

ออกให้ ณ วันที่ ๒๔ เดือนมิถุนายน พ.ศ. ๒๕๖๓

ลงชื่อ

(นายดามพ์ มุกด์มณี)
นายแพทย์ ระดับชำนาญการ
ประธานคณะกรรมการจริยธรรมการวิจัยในมนุษย์

ลำดับที่๕๖/๒๕๖๓

คณะกรรมการจริยธรรมการวิจัยในมนุษย์ โรงพยาบาลสุราษฎร์ธานี ถ.ศรีวิชัย อ.เมือง จ.สุราษฎร์ธานี ๘๔๐๐๐
โทร. (๐๗๗) ๙๑๕๖๐๐ ต่อ ๗๔๐๘, โทรสาร (๐๗๗) ๙๑๕๖๔๒

COE No. 56/2563
REC No. 46/2563

คณะกรรมการจริยธรรมการวิจัยเกี่ยวกับมนุษย์
โรงพยาบาลมหาราชนครศรีธรรมราช กระทรวงสาธารณสุข
ที่อยู่ 198 ถนนราชดำเนิน ต.ในเมือง อ.เมือง จ.นครศรีธรรมราช โทร  075340250

**เอกสารรับรองโครงการวิจัยแบบเร็ว**

      คณะกรรมการจริยธรรมการวิจัยเกี่ยวกับมนุษย์  โรงพยาบาลมหาราชนครศรีธรรมราช  ดำเนินการ
ให้การรับรองโครงการวิจัยตามแนวทางหลักจริยธรรมการวิจัยเกี่ยวกับคนที่เป็นมาตรฐานสากล ได้แก่ Declaration
of Helsinki, The Belmont Report, CIOMS Guideline และ International Conference on
Harmonization in Good Clinical Practice หรือ ICH-GCP

| | | |
|---|---|---|
| **ชื่อโครงการ** | : | การทดสอบโมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อความเครียดในงานของ พยาบาลห้องคลอด |
| **เลขที่โครงการวิจัย** | : | G-HS 003/2563 |
| **สังกัดหน่วยงาน** | : | มหาวิทยาลัยบูรพา |
| **วิธีทบทวน** | : | แบบเร็ว |
| **รายงาน ความก้าวหน้า** | : | ส่งรายงานความก้าวหน้าอย่างน้อย 1 ครั้ง/ปี หรือ ส่งรายงานฉบับ สมบูรณ์หากดำเนินโครงการเสร็จสิ้นก่อน 1 ปี |
| **เอกสารรับรอง** | : | 46/2563 |

ลงนาม : ..............................................

(นางสาวปรานปวีณ์ โรจน์เจริญงาม)
ประธานคณะกรรมการจริยธรรมการวิจัยในมนุษย์
โรงพยาบาลมหาราชนครศรีธรรมราช

ลงนาม : ..............................................

(นางจันทร์จิรา กงอุบล)
ผู้ช่วยผู้อำนวยการด้านการพัฒนาระบบบริการสุขภาพ
ปฏิบัติราชการแทน ผู้อำนวยการโรงพยาบาลมหาราชนครศรีธรรมราช

**วันที่รับรอง :**   5 สิงหาคม 2563            **วันหมดอายุ :**   4 สิงหาคม 2564

**THE RESEARCH ETHICS COMMITTEE OF HATYAI HOSPITAL (REC-HY)**

**HATYAI HOSPITAL 182 , HATYAI, SONGKHLA 90110 THAILAND**

**DOCUMENTARY PROOF OF ETHICAL CLEARANCE COMMITTEE ON HUMAN RIGHTS RELATED TO RESEARCHES INVOLVING HUMAN SUBJECTS**

| | | | | |
|---|---|---|---|---|
| **ID** | 82 | | **Type of reviews** | |
| **Date** | 21/07/63 | expired after 1 year of issuing | **Full board review** | ☐ |
| **Protocol number** | 82/2563 | | **Expedited review** | ☑ |
| | | | **Exemption** | ☐ |

**Project title**   The Effects of Job demands, Job control, and Job support on Job stress among Intrapartum Nurses: A Causal Model

**Investigators**   POL. CAPT. Sirinthip Boonduaylan

**Institution**   Burapha University

**Document: protocol** ☑

**Document: informed consent** ☑       **Document: other**

**Progress report** ☑       This document is approved for "conduct of research" only.

**Final report** ☑       Progress report and final report have not been received yet except notification.

The aforementioned documents have been reviewed and acknowledged by Committe human rights related to researches involving human subjects, based on the declaration of Helsinki

Signature of Committee

...................................................................................................

Charoen  Kaitwatcharachai

โรงพยาบาลยะลา
๑๕๒ ถนนสิโรรส อำเภอเมือง
จังหวัดยะลา ๙๕๐๐๐

## หนังสือรับรองนี้ให้ไว้เพื่อแสดงว่า

**โครงการวิจัยเรื่อง :** THE EFFECTS OF JOB DEMANDS,JOB CONTROL, AND JOB
SUPPORT ON JOB STRESS AMONG INTRAPARTUIM NURSES ;
A CAUSAL MODEL (การทดสอบโมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบ
ต่อความเครียดในงานของพยาบาลห้องคลอด)

**ผู้ทำวิจัย** : รตอ.ญ.ศิรินทร์ทิพย์ บุญด้วยลาน

**รหัสโครงการวิจัย :** ๑๖ / ๒๕๖๓

ได้ผ่านการพิจารณาและได้รับความเห็นชอบจากคณะกรรมการพิจารณาจริยธรรม
การทำวิจัยในมนุษย์ โรงพยาบาลยะลา แล้ว

**วันที่รับรอง :** 10 ก.ค. 2563    **วันหมดอายุ :** - 9 ก.ค. 2564

(นายประภัศร์ ติปยานนท์)
นายแพทย์ชำนาญการพิเศษ
ประธานคณะกรรมการพิจารณาจริยธรรมการทำวิจัยในมนุษย์

(นางอวาทิพย์ แว)
นักวิชาการสาธารณสุขชำนาญการพิเศษ
กรรมการ

(นางนริศรา ติปยานนท์)
เภสัชกรชำนาญการ
กรรมการ

(นายปราโมทย์ จินสกุล)
พยาบาลวิชาชีพชำนาญการ
กรรมการ

(ดร.ฮูดา แวหะยี)
อาจารย์พนักงานมหาวิทยาลัย
กรรมการ

โดยให้เก็บข้อมูลวิจัย ได้ตั้งแต่วันที่ ๑ มิถุนายน ๒๕๖๓ - ๓๐ กันยายน ๒๕๖๓

คณะกรรมการจริยธรรมการวิจัยในมนุษย์โรงพยาบาลสระบุรี

กระทรวงสาธารณสุข

18 ถนนเทศบาล 4  อำเภอเมือง จังหวัดสระบุรี โทร. 036-343500 ต่อ 1551

## เอกสารรับรองโครงการวิจัยแบบเร็ว

คณะกรรมการจริยธรรมการวิจัยในมนุษย์โรงพยาบาลสระบุรี   ดำเนินการให้การรับรองโครงการวิจัยตาม แนวทางหลักจริยธรรมการวิจัยเกี่ยวกับคนที่เป็นมาตรฐานสากล ได้แก่ Declaration of Helsinki, The Belmont Report, CIOMS Guideline  และ  International Conference on Harmonization in Good Clinical Practice หรือ ICH-GCP

**ชื่อโครงการ:** การทดสอบโมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อความเครียดในงานของพยาบาล ห้องคลอด

เลขที่โครงการวิจัย : SRBR63-017                                     เลขที่หนังสือรับรอง:EC017/2563

ผู้วิจัยหลัก      : ร.ต.อ.หญิงศิรินทร์ทิพย์ ........น

สังกัดหน่วยงาน : มหาวิทยาลัยบูรพา

เอกสารรับรอง :

1. โครงร่างงานวิจัย
2. เครื่องมือที่ใช้เก็บรวบรวมข้อมูล
3. Inform  Consent  form

ลงนาม : ........................................                    ลงนาม : ........................................

(นายแพทย์ณรงค์ศักดิ์  วัชรโทน)                              (นางสมศิริ  พันธุ์ศักดิ์ศิริ)
        ประธานกรรมการ                                     กรรมการและเลขานุการ

วันที่รับรอง :   19  พฤษภาคม  2563
วันหมดอายุ :   19  พฤษภาคม  2564

ทั้งนี้ การรับรองนี้มีเงื่อนไขดังที่ระบุไว้ด้านหลังทุกข้อ (ดูด้านหลังของเอกสารรับรองโครงการวิจัย)
นักวิจัยทุกท่านที่ผ่านการรับรองจริยธรรมการวิจัยต้องปฏิบัติดังต่อไปนี้

คณะกรรมการจริยธรรมการวิจัยในมนุษย์ โรงพยาบาลพระนครศรีอยุธยา
46 หมู่4 ต.ประตูชัย อ.พระนครศรีอยุธยา จ.พระนครศรีอยุธยา โทร 035-211888 ต่อ 2509

เอกสารรับรองการยกเว้นพิจารณาจริยธรรมโครงการวิจัย

คณะกรรมการจริยธรรมการวิจัยในมนุษย์ โรงพยาบาลพระนครศรีอยุธยา ดำเนินการให้รับรองโครงการวิจัย
ตามแนวทางหลักจริยธรรมการวิจัยในคนที่เป็นมาตรฐานสากลได้แก่ Declaration of Helsinki, The Belmont
Report, CIOMS Guideline และ International Conference on Harmonization in Good Clinical Practice
หรือ ICH-GCP

| | |
|---|---|
| ชื่อโครงการ | : การทดสอบโมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อความเครียดในงาน<br>ของพยาบาลห้องคลอด |
| เลขที่โครงการวิจัย | : 003/62 |
| ผู้วิจัยหลัก | : ร.ต.อ.หญิงศิรินทร์ทิพย์ บุญด้วยลาน |
| สังกัดหน่วยงาน | : คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา |
| เอกสารรับรอง | : - แบบเสนอโครงร่างการวิจัย<br>- แบบสอบถามการวิจัย<br>- หนังสือแสดงเจตนายินยอมเข้าร่วมการวิจัย |

ลงนาม................................................
( ดร.พญ.ประกายทิพ สุศิลปรัตน์ )
ประธานคณะกรรมการจริยธรรมการวิจัยในมนุษย์

ลงนาม................................................
( นายธีร์รัฐ พงศ์เลิศอารี )
กรรมการและเลขานุการ
คณะกรรมการจริยธรรมการวิจัยในมนุษย์

วันที่รับรองการยกเว้นพิจารณาจริยธรรม : 2 5 MAR 2020
หมายเหตุ ไม่ต้องทบทวนต่อเนื่อง (การแก้ไขเปลี่ยนแปลง,รายงานความก้าวหน้า,รายงานเมื่อเสร็จสิ้นการวิจัย ,อื่นๆ )

**APPENDIX B**

Permission instruments

ที่ อว 67.26/0๋๋๑๐

คณะศิลปศาสตร์ มหาวิทยาลัยธรรมศาสตร์
เลขที่ 2 ถนนพระจันทร์ กรุงเทพฯ 10200

๑๖ มกราคม 2563

เรื่อง    อนุญาตให้ใช้เครื่องมือการวิจัย

เรียน    คณบดีคณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา

อ้างถึง   หนังสือคณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา ที่ อว 8106/0961 ลงวันที่ 18 ธันวาคม 2562

           ตามหนังสือที่อ้างถึง แจ้งว่า รตอ.ญ.ศิรินทร์ทิพย์ บุญด้วยลาน รหัสประจำตัว 60810012 นิสิต
หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา
มีความประสงค์ขออนุญาตใช้เครื่องมือการวิจัย คือ Job Stress Questionnaires ซึ่งเป็นส่วนหนึ่งของวิทยานิพนธ์เรื่อง
"ความสัมพันธ์ระหว่างข้อเรียกร้องจากงานกับความเครียดในการทำงาน โดยมีการมองโลกในแง่ดี และความขัดแย้ง
ระหว่างงานกับครอบครัวเป็นตัวแปรกำกับ" ของ นายไพมลิน แจ่มพงษ์ หลักสูตรศิลปศาสตรมหาบัณฑิต สาขาวิชา
จิตวิทยาอุตสาหกรรมและองค์การ คณะศิลปศาสตร์ มหาวิทยาลัยธรรมศาสตร์ ซึ่งจบการศึกษาในปีการศึกษา 2559
เพื่อนำมาใช้ในการเก็บข้อมูลการทำดุษฎีนิพนธ์ ความละเอียดแจ้งแล้ว นั้น

           ภาควิชาจิตวิทยา คณะศิลปศาสตร์ มหาวิทยาลัยธรรมศาสตร์ ขอเรียนว่า ภาควิชาฯ มีความยินดี
อนุญาตให้ รตอ.ญ.ศิรินทร์ทิพย์ บุญด้วยลาน ใช้เครื่องมือการวิจัยดังกล่าวในการเก็บข้อมูลการทำดุษฎีนิพนธ์ตามที่ขอ
ทั้งนี้ ขอให้อ้างอิงตามรูปแบบที่เหมาะสมด้วย

           จึงเรียนมาเพื่อโปรดทราบ

เรียนคณบดี
๑. เพื่อโปรดทราม
๒. เพิ่มตรวจสภาพ แจ้งงาน มหาวิทยาลัย
แจ้งนิสิตทราบ

๐๒๒๒
2 3 ม.ค. 2563

สำนักงานเลขานุการคณะฯ
โทร. 02-613-2695

ขอแสดงความนับถือ

(รองศาสตราจารย์ทัศนีย์ เมธาพิสิฐ)
รองคณบดีฝ่ายบริหารท่าพระจันทร์และบัณฑิตศึกษา
ปฏิบัติการแทนคณบดีคณะศิลปศาสตร์

-สำเนา-

ที่ อว ๘๑๐๖/ ๐๕๖๐

มหาวิทยาลัยบูรพา คณะพยาบาลศาสตร์
๑๖๙ ถนนลงหาดบางแสน ตำบลแสนสุข
อำเภอเมือง จังหวัดชลบุรี ๒๐๑๓๑

๑๙ ธันวาคม ๒๕๖๒

เรื่อง  ขออนุญาตใช้เครื่องมือการวิจัย
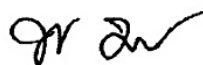
เรียน  คณบดีคณะแพทยศาสตร์ มหาวิทยาลัยสงขลานครินทร์

ด้วย รต.อ.ญ.ศิรินทร์ทิพย์ บุญด้วยลาน รหัสประจำตัว ๖๐๘๑๐๐๑๒ นิสิตหลักสูตรปรัชญาดุษฎี
บัณฑิต สาขาวิชาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา ได้รับอนุมัติ
เค้าโครงดุษฎีนิพนธ์ เรื่อง "THE EFFECTS OF JOB DEMANDS, JOB CONTROL, AND JOB SUPPORT
ON JOB STRESS AMONG INTRAPARTUM NURSES: A CAUSAL MODEL" โดยมี รองศาสตราจารย์ ดร.
จินตนา วัชรสินธุ์ เป็นประธานกรรมการควบคุมดุษฎีนิพนธ์

ทั้งนี้ รต.อ.ญ.ศิรินทร์ทิพย์ บุญด้วยลาน มีความประสงค์ขออนุญาตใช้เครื่องมือการวิจัย คือ THE
THAI VERSION OF THE JOB CONTENT QUESTIONNAIRE (TJCQ) ซึ่งเป็นส่วนหนึ่งของงานวิจัย เรื่อง
" CONSTRUCT VALIDITY OF THE THAI VERSION OF THE JOB CONTENT QUESTIONNAIRE IN A
LARGE POPULATION OF HETEROGENEOUS OCCUPATIONS" ของ คุณพิชญา พรรคทองสุข ซึ่งตีพิมพ์
ใน JOURNAL OF THE MEDICAL ASSOCIATION OF THAILAND ค.ศ. 2009 เพื่อนำมาใช้ในการเก็บ
ข้อมูลการทำดุษฎีนิพนธ์ในครั้งนี้

จึงเรียนมาเพื่อโปรดพิจารณาอนุญาตด้วย จะเป็นพระคุณยิ่ง

ขอแสดงความนับถือ

(ผู้ช่วยศาสตราจารย์ ดร.พรชัย จูลเมตต์)
คณบดีคณะพยาบาลศาสตร์ ปฏิบัติการแทน
ผู้รักษาการแทนอธิการบดีมหาวิทยาลัยบูรพา

งานบริการการศึกษา (บัณฑิตศึกษา)
โทรศัพท์ (๐๓๘) ๑๐๒๘๑๖, ๑๐๒๘๗๕
โทรสาร (๐๓๘) ๓๙๓๓๗๖
ผู้วิจัย ๐๘-๓๐๑๕-๔๔๘๐

## Fwd: about "Parker's Job Stress Scale. by Parker & DeCotiis (1983)"

From: Sirinthip Boonduaylan (sirinth_dol @yahoo.com)

To:       sirinth44@gmail.com

Date:  Tuesday, 18 February 2020, 01.36 am GMT+7

Sent from my iPhone

Begin forwarded message:

> From: محمد جواد <memjavad@gmail.com>
> Date: 18 February BE 2563 13:25:43 GMT+7
> To: sirinth_dol@yahoo.com
> Subject: about "Parker's Job Stress Scale. by Parker & DeCotiis (1983)"

Hello,

thank you for contacting us

you have our permission to use the scale in your study  as long as you cite us as the source

Arab Psychology Team

## Re: about "Parker's Job Stress Scale. by Parker & DeCotiis (1983)"

From: Sirinthip Boonduaylan (sirinth_dol @yahoo.com)

To:       memjavad@gmail.com

Date:  Tuesday, 18 February 2020, 01:44 am GMT+7

To whom it may concern

I would like to thank you for your kindness and any of your attention given to this request is greatly appreciated.

Sent from my iPhone

> On 18 Feb BE 2563, at 13:25, محمد جواد <memjavad@gmail.com> wrote:
>
>
> Hello,
>
> thank you for contacting us
>
> you have our permission to use the scale in your study  as long as you cite us as the source
>
> Arab Psychology Team

**APPENDIX C**

Participant information and consent form

เอกสารชี้แจงผู้เข้าร่วมโครงการวิจัย

(Participant Information Sheet)

เลขที่หนังสือรับรอง: ……………………
(คณะกรรมการจริยธรรมการวิจัยในมนุษย์โรงพยาบาล………………………. เป็นผู้ออกเลขที่
หนังสือรับรอง)

โครงการวิจัย

เรื่อง    โมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อความเครียดในงานของพยาบาลห้องคลอด
เรียน    ผู้ร่วมโครงการวิจัย

        ข้าพเจ้า ร.ต.อ.หญิงศิรินทร์ทิพย์ บุญด้วยลาน นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต
สาขาวิชาพยาบาลศาสตร์ คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา มีความประสงค์ขอเรียนเชิญท่าน
เข้าร่วมโครงการวิจัย "โมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อความเครียดในงานของพยาบาล
ห้องคลอด" ก่อนที่ท่านจะตกลง เข้าร่วมการวิจัย ขอเรียนให้ท่านทราบรายละเอียดของโครงการวิจัย
ดังนี้

        โครงการวิจัยนี้มีวัตถุประสงค์เพื่อทดสอบโมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อ
ความเครียดใน งานของพยาบาลห้องคลอด กลุ่มตัวอย่าง คือ พยาบาลวิชาชีพประจำห้องคลอด
ปฏิบัติงาน ณ โรงพยาบาลศูนย์ สังกัดกระทรวงสาธารณสุข จำนวน 282 คน

        ท่านได้รับเชิญให้เข้าร่วมการวิจัยครั้งนี้ เนื่องจากท่านเป็นผู้ที่มีคุณสมบัติตรงกับกลุ่ม
ตัวอย่างของการ ศึกษา เมื่อท่านเข้าร่วมการวิจัยแล้ว ข้าพเจ้าขอความร่วมมือให้ท่านตอบ
แบบสอบถามด้วยตัวของท่านเอง ซึ่งแบบสอบถามฉบับนี้มีทั้งหมด 6 หน้า แบ่งเป็น 3 ส่วน คือ 1)
แบบสอบถามข้อมูลส่วนบุคคล 2) แบบสอบถามความเครียดของงาน (Thai-JCQ) ฉบับภาษาไทย
และ 3) แบบวัดความเครียดจากการทำงาน (Job Stress Scale) ซึ่งจะใช้เวลาทั้งสิ้นประมาณ 30-40
นาที ทั้งนี้ท่านอาจมีความไม่สุขสบายจากการตอบแบบสอบถาม หรือหากท่านไม่สะดวกใจที่จะ
ตอบแบบสอบถาม ท่านสามารถที่จะหยุดตอบแบบสอบถาม หรือถอนตัวออกจากโครงการวิจัยได้
ตลอดเวลาโดยไม่มีผลต่อคะแนนประเมินที่ท่านพึงได้รับ ประโยชน์ของการวิจัยครั้งนี้จะเป็น
ประโยชน์ทางอ้อมแก่ท่าน ซึ่งผลการวิจัยครั้งนี้ จะได้รูปแบบโมเดลเชิงสาเหตุของปัจจัยที่มี

ผลกระทบต่อความเครียดในงานของพยาบาลห้องคลอด รวมถึงเป็นข้อมูลพื้นฐานในการจัดทำ
นโยบายหรือแนวทางการบริหารจัดการปัจจัยที่ก่อให้เกิดความเครียดในงานของพยาบาลห้องคลอด
ให้มีความเหมาะสม และลดความเครียดในงานของพยาบาลห้องคลอด

     การเข้าร่วมการวิจัยของท่านครั้งนี้เป็นไปด้วยความสมัครใจ ท่านมีสิทธิยกเลิกหรือถอน
ตัวออกจากโครงการวิจัยได้ตลอดเวลาโดยไม่มีมีผลกระทบใดๆ ทั้งสิ้น และไม่ต้องแจ้งให้ผู้วิจัย
ทราบล่วงหน้า ผู้วิจัยจะเก็บรักษาข้อมูลของท่านโดยใช้รหัสตัวเลขแทนการระบุชื่อ และสิ่งใดๆ ที่
อาจอ้างอิงหรือทราบได้ว่า ข้อมูลนี้เป็นของท่าน ข้อมูลของท่านที่เป็นกระดาษแบบสอบถามจะถูก
เก็บอย่างมิดชิด และปลอดภัยในตู้เก็บเอกสารและล็อคกุญแจตลอดเวลา สำหรับข้อมูลที่เก็บใน
คอมพิวเตอร์ของผู้วิจัยจะถูกใส่รหัสผ่าน ข้อมูลที่กล่าวมาทั้งหมดจะมีเพียงผู้วิจัยและอาจารย์ที่
ปรึกษาเท่านั้นที่สามารถเข้าถึงข้อมูลได้ ผู้วิจัยจะรายงานผลการวิจัย และ เผยแพร่ผลการวิจัยใน
ภาพรวม สุดท้ายหลังจากผลการวิจัยได้รับการตีพิมพ์เผยแพร่ในวารสารเรียบร้อยแล้ว ข้อมูล
ทั้งหมดจะถูกทำลาย

     หากท่านมีปัญหาหรือข้อสงสัยประการใด สามารถติดต่อสอบถามเกี่ยวกับการวิจัยครั้งนี้
ได้ตลอดเวลาที่ ร.ต.อ.หญิงศิรินทร์ทิพย์ บุญด้วยลาน หมายเลขโทรศัพท์ 083-0954480 หรือที่
รศ. ดร. จินตนา วัชรสินธุ์ อาจารย์ที่ปรึกษาหลัก หมายเลขโทรศัพท์ 038-102824 และหากผู้วิจัยไม่
ปฏิบัติตามที่ได้ชี้แจงไว้ในเอกสารชี้แจงผู้เข้าร่วมโครงการวิจัย สามารถแจ้งมายังคณะกรรมการ
พิจารณาจริยธรรมการวิจัยในมนุษย์ มหาวิทยาลัยบูรพา กองบริหารการวิจัยและนวัตกรรม
หมายเลขโทรศัพท์ 038-102561-62 หรือที่คณะกรรมการจริยธรรมการวิจัยในมนุษย์
**โรงพยาบาล.........................หมายเลขโทรศัพท์ .............................. (เวลาราชการ)**

ร.ต.อ.หญิงศิรินทร์ทิพย์ บุญด้วยลาน

ผู้วิจัย

เอกสารแสดงความยินยอม
ของผู้เข้าร่วมโครงการวิจัย (Consent Form)

รหัสโครงการวิจัย : ………………………………………………..
(สำนักงานคณะกรรมการจริยธรรมวิจัยในมนุษย์โรงพยาบาล……………………………………..
เป็นผู้ออกรหัสโครงการวิจัย)

     การวิจัยเรื่อง การทดสอบโมเดลเชิงสาเหตุของปัจจัยที่มีผลกระทบต่อความเครียดในงาน
ของพยาบาลห้องคลอด
     ให้คำยินยอม วันที่ …….......…. เดือน ……………........…………… พ.ศ. ………………

     ก่อนที่จะลงนามในเอกสารแสดงความยินยอมของผู้เข้าร่วมโครงการวิจัยนี้ ข้าพเจ้าได้รับ
การอธิบายถึงวัตถุประสงค์ของโครงการวิจัย วิธีการวิจัย และรายละเอียดต่างๆ ตามที่ระบุใน
เอกสารข้อมูลสำหรับผู้เข้าร่วมโครงการวิจัย ซึ่งผู้วิจัยได้ให้ไว้แก่ข้าพเจ้า และข้าพเจ้าเข้าใจคา
อธิบายดังกล่าวครบถ้วนเป็นอย่างดีแล้ว และผู้วิจัยรับรองว่าจะตอบคาถามต่างๆ ที่ข้าพเจ้าสงสัย
เกี่ยวกับการวิจัยนี้ด้วยความเต็มใจ และ ไม่ปิดบังซ่อนเร้นจนข้าพเจ้าพอใจ
     ข้าพเจ้าเข้าร่วมโครงการวิจัยนี้ด้วยความสมัครใจ และมีสิทธิที่จะบอกเลิกการเข้าร่วม
โครงการวิจัยนี้เมื่อใดก็ได้ และการบอกเลิกการเข้าร่วมการวิจัยนี้ จะไม่มีผลกระทบใด ๆ ต่อข้าพเจ้า
     ผู้วิจัยรับรองว่าจะเก็บข้อมูลเกี่ยวกับตัวข้าพเจ้าเป็นความลับ จะเปิดเผยได้เฉพาะในส่วน
ที่เป็นสรุปผลการวิจัย การเปิดเผยข้อมูลของข้าพเจ้าต่อหน่วยงานต่างๆ ที่เกี่ยวข้องต้องได้รับ
อนุญาตจากข้าพเจ้า
     ข้าพเจ้าได้อ่านข้อความข้างต้นแล้วมีความเข้าใจดีทุกประการ และได้ลงนามในเอกสาร
แสดง ความยินยอมนี้ด้วยความเต็มใจ


     ลงนาม ………………….………………….ผู้ยินยอม
      (………………………………………………)
     ลงนาม ……………………………….......พยาน
      (……………………..............…………)

**APPENDIX D**

Questionnaires

แบบสอบถามการวิจัย

เรื่อง ผลกระทบของข้อเรียกร้องจากงาน การควบคุมในงาน และการสนับสนุนงานที่มี
ต่อความเครียดในงานของพยาบาลห้องคลอด: แบบจำลองเชิงสาเหตุ

**คำชี้แจง**: 1. แบบสอบถามฉบับนี้ประกอบด้วย 3 ส่วน ดังนี้

ส่วนที่1 แบบสอบถามข้อมูลส่วนบุคคล จำนวน 10 ข้อ

ส่วนที่ 2 แบบสอบถาม**ความเครียดของงาน (Thai-JCQ)** จำนวน 49 ข้อ

ประกอบด้วย 3 ด้าน ดังนี้

    ด้านที่ 1 ข้อเรียกร้องจากงาน    30 ข้อ

    ด้านที่ 2 การควบคุมในงาน     11 ข้อ

    ด้านที่ 3 การสนับสนุนงาน      8 ข้อ

ส่วนที่ 3 แบบวัดความเครียดจากการทำงาน (Job Stress Scale) จำนวน 13 ข้อ

2. แบบสอบถามฉบับนี้ผู้ตอบคือ พยาบาลวิชาชีพประจำห้องคลอด โรงพยาบาลศูนย์
สังกัดกระทรวงสาธารณสุข ที่มีประสบการณ์การปฏิบัติงานในตำแหน่งพยาบาลวิชาชีพประจำห้อง
คลอดตั้งแต่ 6 เดือนขึ้นไป

3. กรุณาอ่านคำชี้แจงก่อนตอบแบบสอบถามและกรุณาตอบคำถามทุกข้อเพื่อให้ได้
คำตอบที่สมบูรณ์อันจะเป็นประโยชน์อย่างยิ่งสำหรับใช้ในการวิเคราะห์ได้จริง

ขอขอบพระคุณพยาบาลห้องคลอดทุกท่านที่ให้ความร่วมมือในการตอบแบบสอบถาม

ร.ต.อ.หญิงศิรินทร์ทิพย์ บุญด้วยลาน

นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์

คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา

ส่วนที่ 1 แบบสอบถามข้อมูลส่วนบุคคล

**คำชี้แจง:** กรุณาเขียนรายละเอียด หรือทำเครื่องหมาย √ ลงใน ช่อง □ ตามความเป็นจริงมากที่สุด

1. ปัจจุบันท่านอายุ.......................................ปี

2. สถานภาพสมรส     □ โสด      □ คู่     □ หม้าย/หย่า/แยก

3. ท่านมีบุตรหรือไม่    □ ไม่มี     □ มี จำนวน.....................คน

4. …………………………………………..

5. …………………………………………..

10. …………………………………………..
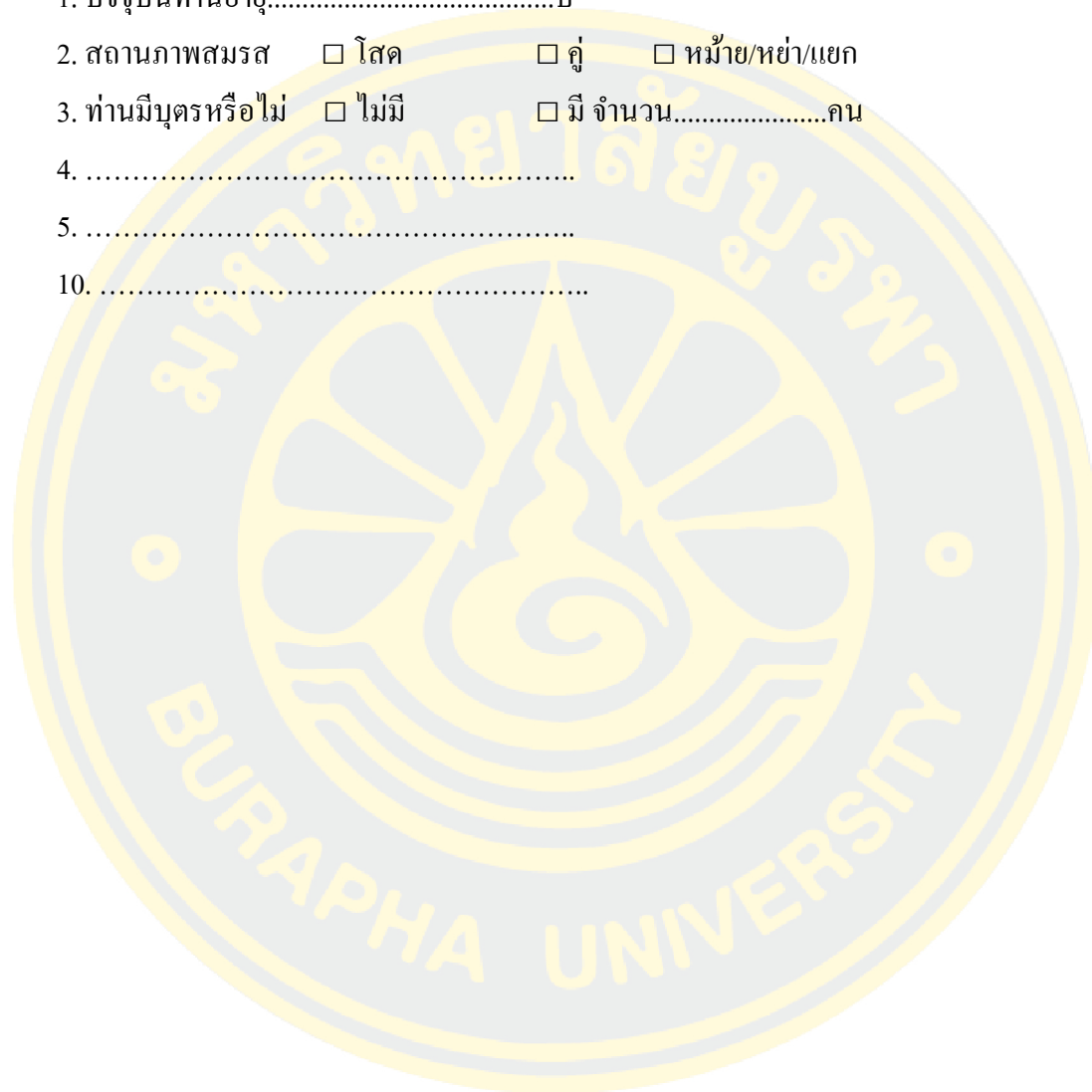
ส่วนที่ 2 แบบสอบถามความเครียดของงาน (Thai-JCQ) จำนวน 49 ข้อ

ประกอบด้วย 3 ด้าน ดังนี้

         ด้านที่ 1 ข้อเรียกร้องจากงาน   30 ข้อ

         ด้านที่ 2 การควบคุมในงาน     11 ข้อ

         ด้านที่ 3 การสนับสนุนงาน       8 ข้อ

**คำชี้แจง:** โปรดทำเครื่องหมาย √ ในช่องที่ตรงกับระดับความรู้สึก/ความคิดเห็นของท่านมากที่สุด เพียงข้อเดียว ในกรณีที่ไม่มีคำตอบใดตรง กรุณาเลือกข้อที่ใกล้เคียงความรู้สึกที่สุดเพียงข้อเดียว <u>**กรุณาอย่าเว้นข้อใดว่างไว้**</u>

| ข้อความ | ไม่เห็นด้วยมาก (1) | ไม่เห็นด้วย (2) | เห็นด้วย (3) | เห็นด้วยมาก (4) |
|---|---|---|---|---|
| 1. คุณต้องทำสิ่งซ้ำ ๆ หลาย ๆ ครั้งในงาน | | | | |
| 2. คุณต้องทำงานที่มีลักษณะหลากหลายมาก | | | | |
| 3. ……………………………………………… | | | | |
| ……………………………………………… | | | | |
| ……………………………………………… | | | | |
| ……………………………………………… | | | | |
| ……………………………………………… | | | | |
| ……………………………………………… | | | | |
| 49……………………………..……………… | | | | |

ส่วนที่ 3 แบบวัดความเครียดจากการทำงาน (Job Stress Scale) จำนวน 13 ข้อ

**คำชี้แจง** ขอให้ท่านประเมินตนเองว่า ในระยะเวลา 4 สัปดาห์ที่ผ่านมา ท่านมีความรู้สึกตรงกับ

ข้อความต่อไปนี้มากน้อยเพียงใด โดยทำเครื่องหมาย / ลงในช่องคำตอบ ที่ตรงกับตัวท่านมากที่สุด

| | | |
|---|---|---|
| 1 | หมายถึง | งานประจำวันทำให้เกิดความรู้สึกดังกล่าวน้อยที่สุด |
| 2 | หมายถึง | งานประจำวันทำให้เกิดความรู้สึกดังกล่าวเล็กน้อย |
| 3 | หมายถึง | งานประจำวันทำให้เกิดความรู้สึกดังกล่าวปานกลาง |
| 4 | หมายถึง | งานประจำวันทำให้เกิดความรู้สึกดังกล่าวมาก |
| 5 | หมายถึง | งานประจำวันทำให้เกิดความรู้สึกดังกล่าวมากที่สุด |

| ข้อ | ข้อความ | ระดับความรู้สึก | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| 1. | ฉันมักจะหงุดหงิดและกระวนกระวายใจกับการทำงานของฉัน | | | | | |
| 2. | การทำงานที่นี่ ทำให้ฉันมีเวลาให้กับครอบครัวน้อยลง | | | | | |
| 3. | ฉันต้องทุ่มเทให้กับงานของฉันมากกว่าที่ควรจะเป็น | | | | | |
| - | …………………………………………………………… | | | | | |
| - | …………………………………………………………… | | | | | |
| - | …………………………………………………………… | | | | | |
| 13. | …………………………………………………………… | | | | | |

**APPENDIX E**

Evaluation of assumptions

Test of outliers

Table Appendix E-1 Univariate outliers

| ID | Zdem | Zcont | Zsupp | Zstress | ID | Zdem | Zcont | Zsupp | Zstre |
|----|------|-------|-------|---------|----|------|-------|-------|-------|
| 1 | 1.013 | -0.442 | 0.252 | -1.448 | 39 | -0.440 | 0.834 | 1.087 | -1.150 |
| 2 | 0.044 | -0.187 | 1.366 | 0.040 | 40 | -0.683 | -0.187 | -0.027 | -1.150 |
| 3 | -1.167 | -0.697 | -0.027 | -0.852 | 41 | -0.440 | 0.068 | -0.027 | 0.437 |
| 4 | -0.561 | 0.068 | -0.027 | 0.635 | 42 | 0.286 | -0.187 | 1.087 | 0.338 |
| 5 | -0.925 | -0.442 | -0.027 | -0.952 | 43 | -0.561 | -0.187 | -0.027 | 1.032 |
| 6 | -0.683 | -2.228 | -0.862 | -0.158 | 44 | -0.804 | 0.834 | 1.087 | -1.348 |
| 7 | -0.804 | -1.973 | -0.305 | -1.348 | 45 | -0.077 | -0.187 | -0.027 | -0.357 |
| 8 | 0.771 | 1.089 | 1.087 | 0.635 | 46 | -0.561 | 0.324 | -0.305 | -0.257 |
| 9 | -0.804 | -1.718 | -1.141 | -1.051 | 47 | -0.198 | -0.697 | 0.530 | -1.348 |
| 10 | 0.165 | -2.994 | -0.027 | 0.338 | 48 | -0.077 | -0.187 | 1.087 | -0.654 |
| 11 | -0.925 | 0.068 | 1.644 | -1.547 | 49 | 0.529 | -0.697 | -0.027 | 0.536 |
| 12 | -0.077 | -0.442 | -0.027 | 0.040 | 50 | 0.529 | 0.834 | -0.027 | -0.753 |
| 13 | -0.804 | -0.187 | -0.027 | -0.952 | 51 | -0.561 | 0.579 | 1.087 | -1.249 |
| 14 | 0.165 | -0.187 | -0.027 | -0.158 | 52 | -0.198 | 0.068 | -0.027 | -0.654 |
| 15 | -0.319 | 0.834 | 0.530 | 0.239 | 53 | 0.044 | -0.187 | -0.027 | -1.646 |
| 16 | -1.288 | -0.697 | -0.027 | -2.043 | 54 | -0.319 | -0.187 | -0.027 | -0.257 |
| 17 | -1.530 | 0.068 | -0.027 | -1.051 | 55 | -0.440 | 0.324 | -0.027 | 1.032 |
| 18 | 1.134 | 0.324 | -0.027 | 0.834 | 56 | -0.804 | -0.697 | -0.027 | -1.150 |
| 19 | 1.134 | 0.834 | -0.305 | 0.933 | 57 | -2.015 | 2.620 | 2.201 | -1.348 |
| 20 | -0.925 | -0.697 | -0.027 | -1.646 | 58 | 0.529 | -0.697 | -0.027 | -0.158 |
| 21 | -0.319 | -0.697 | -0.027 | -0.555 | 59 | 0.529 | -0.187 | -0.027 | -0.555 |
| 22 | 0.892 | -1.463 | -3.369 | 1.330 | 60 | 0.286 | 0.324 | 0.252 | -1.943 |
| 23 | 0.407 | -0.697 | -0.584 | 0.536 | 61 | 2.345 | 0.579 | -2.255 | 1.131 |
| 24 | 0.771 | -1.973 | 0.530 | 0.734 | 62 | -0.804 | -0.187 | -0.305 | -0.852 |
| 25 | -0.804 | -0.187 | -0.027 | -0.654 | 63 | 1.376 | 0.834 | -1.141 | -0.555 |
| 26 | 1.497 | -0.952 | -0.027 | 1.032 | 64 | 0.650 | 0.324 | -0.305 | 1.429 |

Table Appendix E-1 (Continued)

| ID | Zdem | Zcont | Zsupp | Zstress | ID | Zdem | Zcont | Zsupp | Zstre |
|---|---|---|---|---|---|---|---|---|---|
| 27 | -0.440 | -1.718 | -2.255 | 1.230 | 65 | 1.740 | -0.187 | -0.862 | 0.338 |
| 28 | 0.650 | 0.324 | -0.027 | -0.753 | 66 | 0.165 | 0.068 | -2.255 | 0.437 |
| 29 | 0.771 | 0.579 | 0.252 | 0.635 | 67 | 0.286 | 0.579 | -0.027 | 1.230 |
| 30 | 1.013 | 0.324 | -0.305 | -0.059 | 68 | -1.046 | -0.187 | -0.027 | 0.635 |
| 31 | 0.044 | -0.442 | -0.027 | 0.338 | 69 | -0.561 | -0.187 | -0.305 | -1.150 |
| 32 | -0.319 | 0.068 | -0.027 | -0.852 | 70 | 0.650 | -0.442 | -0.027 | 1.825 |
| 33 | 0.771 | -0.187 | -1.141 | 1.330 | 71 | 0.165 | -0.952 | -1.698 | 0.139 |
| 34 | 0.165 | -0.187 | -0.027 | 0.239 | 72 | -0.319 | -0.952 | -0.305 | -1.051 |
| 35 | 0.286 | -0.697 | -0.305 | -1.150 | 73 | 1.497 | -0.952 | -1.976 | 0.239 |
| 36 | 0.044 | -0.442 | -0.027 | 0.635 | 74 | 1.618 | -2.994 | -0.584 | -0.654 |
| 37 | -1.530 | 0.068 | 1.087 | -0.852 | 75 | -0.440 | -2.228 | -0.862 | 0.734 |
| 38 | 0.771 | -1.208 | -1.976 | 0.933 | 76 | 2.224 | -0.442 | -0.862 | 0.734 |
| 77 | -0.683 | -0.187 | -0.027 | -0.257 | 119 | 0.165 | -2.484 | -1.141 | 0.834 |
| 78 | 0.286 | 0.068 | -1.141 | 0.437 | 120 | 0.650 | 0.834 | -0.862 | 0.933 |
| 79 | 0.286 | 0.324 | -0.027 | -0.158 | 121 | -0.804 | -0.697 | -1.141 | 0.040 |
| 80 | -0.925 | 1.344 | -0.027 | -0.357 | 122 | -0.683 | -0.442 | 1.087 | 0.437 |
| 81 | 1.740 | -0.187 | -1.419 | -0.158 | 123 | 1.255 | 1.089 | -0.305 | 0.734 |
| 82 | 2.951 | -2.228 | -3.369 | 1.627 | 124 | 1.497 | -1.463 | -1.419 | 1.330 |
| 83 | -0.925 | -0.697 | -0.027 | -0.257 | 125 | 1.376 | -0.952 | -0.305 | 1.230 |
| 84 | -0.198 | -0.187 | -0.027 | 0.338 | 126 | 0.650 | -0.187 | -0.027 | -0.158 |
| 85 | 0.044 | -0.697 | -0.027 | -0.753 | 127 | 0.407 | -0.952 | -0.027 | 0.338 |
| 86 | -0.440 | -0.442 | -0.305 | -0.555 | 128 | 2.103 | 0.834 | 0.252 | 2.024 |
| 87 | -0.925 | -0.442 | -0.027 | 1.330 | 129 | -0.440 | 0.324 | 0.530 | -0.654 |
| 88 | 1.740 | 0.324 | 1.087 | 1.429 | 130 | 0.771 | -0.187 | -0.027 | -0.257 |
| 89 | -0.804 | -0.442 | -0.027 | -0.059 | 131 | 0.286 | 0.834 | -0.027 | -0.257 |
| 90 | -1.046 | -2.228 | -0.027 | 1.528 | 132 | -0.804 | 1.344 | -0.027 | -0.059 |
| 91 | 2.708 | -1.973 | -0.862 | 0.933 | 133 | -1.046 | -0.187 | -2.255 | 0.338 |

Table Appendix E-1 (Continued)

| ID | Zdem | Zcont | Zsupp | Zstress | ID | Zdem | Zcont | Zsupp | Zstre |
|---|---|---|---|---|---|---|---|---|---|
| 92 | 2.345 | -1.463 | -1.419 | 1.925 | 134 | -0.925 | 0.579 | 1.087 | -1.150 |
| 93 | 1.497 | 0.068 | 0.530 | 1.726 | 135 | 0.771 | -0.187 | -0.027 | 0.338 |
| 94 | -0.925 | 0.579 | 0.252 | -1.448 | 136 | 1.740 | 0.324 | -0.027 | 1.726 |
| 95 | -0.198 | -0.187 | -0.027 | -0.158 | 137 | 0.650 | -0.187 | -0.027 | -0.654 |
| 96 | -1.288 | 1.600 | 0.252 | -0.654 | 138 | 0.650 | 1.855 | 1.644 | -1.348 |
| 97 | 1.740 | -2.484 | -2.533 | 0.834 | 139 | -0.440 | -0.187 | -0.027 | 1.330 |
| 98 | -2.136 | -0.187 | 0.530 | -0.059 | 140 | 0.165 | 1.600 | 0.809 | -0.257 |
| 99 | -2.257 | 0.068 | -0.027 | -0.852 | 141 | 1.982 | 1.089 | -0.027 | 2.619 |
| 100 | -0.925 | -0.442 | -0.027 | 0.139 | 142 | 0.165 | -0.442 | -0.027 | -0.257 |
| 101 | -0.319 | -0.697 | 0.809 | -0.357 | 143 | -0.561 | 2.620 | 2.201 | -0.357 |
| 102 | 0.650 | 0.068 | 1.087 | 0.536 | 144 | -0.319 | -0.187 | -0.027 | -0.158 |
| 103 | 1.013 | 0.834 | 1.366 | 0.338 | 145 | -1.894 | -0.442 | -0.027 | -2.043 |
| 104 | -0.561 | -0.442 | 2.201 | 0.536 | 146 | 0.650 | -0.187 | -0.027 | -0.158 |
| 105 | -0.925 | 0.068 | -0.027 | 0.437 | 147 | -1.288 | -0.187 | -0.027 | -1.051 |
| 106 | -2.136 | -0.187 | -0.027 | -2.043 | 148 | -0.561 | -0.187 | -0.027 | -1.844 |
| 107 | -0.804 | -0.442 | 0.809 | 0.338 | 149 | -0.804 | -0.187 | -0.027 | -0.257 |
| 108 | 0.892 | -0.442 | -0.584 | -0.257 | 150 | -0.683 | 0.579 | 1.923 | -0.753 |
| 109 | -1.288 | -0.187 | -0.027 | -1.943 | 151 | 1.255 | -0.187 | -0.027 | 1.429 |
| 110 | -0.440 | -0.952 | -2.255 | 0.139 | 152 | -0.683 | -0.952 | 0.530 | 1.032 |
| 111 | 1.255 | -0.952 | -0.027 | 0.635 | 153 | 0.407 | 0.068 | 1.366 | -0.456 |
| 112 | -0.198 | -0.442 | -0.305 | 0.834 | 154 | -0.561 | 2.365 | 2.201 | -1.448 |
| 113 | 0.286 | 1.600 | -0.027 | 0.040 | 155 | -0.683 | 2.365 | 2.201 | -1.448 |
| 114 | 0.165 | 0.834 | 0.530 | -0.158 | 156 | -1.046 | -0.187 | -0.027 | -2.043 |
| 115 | 0.044 | -0.952 | -0.305 | -0.158 | 157 | 1.134 | -0.187 | -0.027 | 1.429 |
| 116 | 0.529 | -0.187 | -0.027 | -0.059 | 158 | -0.319 | -0.187 | -1.419 | 0.139 |
| 117 | 1.376 | -0.442 | -0.027 | 0.437 | 159 | -2.136 | 2.110 | 0.252 | -1.448 |
| 118 | 0.044 | 0.068 | -0.027 | 0.139 | 160 | -0.198 | -0.187 | -0.027 | 1.330 |

Table Appendix E-1 (Continued)

| ID | Zdem | Zcont | Zsupp | Zstress | ID | Zdem | Zcont | Zsupp | Zstre |
|----|------|-------|-------|---------|----|------|-------|-------|-------|
| 161 | 0.650 | -1.208 | -0.862 | 0.834 | 203 | 0.771 | 0.579 | 1.366 | -0.357 |
| 162 | -0.198 | 0.579 | 1.087 | 0.635 | 204 | -0.077 | -0.697 | -0.027 | 0.040 |
| 163 | -1.409 | -0.187 | -0.584 | -0.158 | 205 | -0.804 | 1.855 | 2.201 | -1.646 |
| 164 | 1.376 | 2.110 | 0.252 | 0.734 | 206 | -0.440 | -0.187 | -0.027 | -1.249 |
| 165 | 1.013 | 0.068 | -0.027 | 1.032 | 207 | -0.198 | -0.187 | 0.252 | -0.059 |
| 166 | 0.165 | -0.187 | -0.027 | 0.239 | 208 | 0.771 | -0.187 | 0.252 | 0.933 |
| 167 | 0.407 | 1.089 | 0.530 | 0.437 | 209 | -1.288 | 0.068 | -0.027 | -0.753 |
| 168 | 0.165 | 2.365 | -0.584 | 0.239 | 210 | -1.167 | 0.324 | -0.027 | -1.745 |
| 169 | -1.046 | -0.187 | -0.862 | -0.952 | 211 | -1.288 | -0.187 | 0.530 | -1.646 |
| 170 | 0.771 | -0.187 | -0.584 | 0.437 | 212 | -0.198 | 2.365 | 2.201 | -0.456 |
| 171 | -1.288 | 0.068 | -0.862 | 0.933 | 213 | -0.683 | -0.697 | -0.305 | -0.257 |
| 172 | 0.044 | -0.187 | -1.141 | 1.726 | 214 | 0.892 | -0.442 | -0.027 | 1.131 |
| 173 | 1.255 | 0.324 | 0.809 | 1.528 | 215 | 0.165 | -0.187 | -0.027 | -0.654 |
| 174 | 1.376 | 2.365 | -0.027 | -0.357 | 216 | -1.409 | -0.187 | -0.027 | 0.239 |
| 175 | 0.650 | -0.187 | -0.584 | 0.437 | 217 | -2.378 | 2.620 | -4.483 | -2.241 |
| 176 | -1.167 | 0.834 | -0.027 | 1.131 | 218 | -2.620 | 2.110 | 2.201 | -1.844 |
| 177 | 1.013 | 2.365 | -0.027 | 1.627 | 219 | -0.925 | 0.579 | 1.644 | -0.753 |
| 178 | 1.013 | 0.324 | -0.027 | 0.834 | 220 | -1.167 | 1.344 | 2.201 | -0.753 |
| 179 | -0.440 | 0.834 | -0.027 | -0.357 | 221 | 0.165 | 0.834 | 0.252 | -0.952 |
| 180 | 1.013 | -0.442 | -1.419 | 1.230 | 222 | 0.407 | 0.579 | -0.027 | -0.059 |
| 181 | 0.286 | 0.834 | -0.027 | 0.933 | 223 | -0.925 | 0.068 | 0.252 | -2.043 |
| 182 | 0.892 | -0.442 | -1.419 | 0.734 | 224 | -1.530 | -0.187 | -0.027 | -0.555 |
| 183 | 0.286 | 0.324 | -0.862 | 0.734 | 225 | 0.529 | -0.442 | -0.027 | -1.150 |
| 184 | 0.650 | 1.089 | -0.027 | -0.059 | 226 | -0.925 | 0.579 | 0.809 | 0.239 |
| 185 | -0.683 | -0.697 | -0.027 | -0.952 | 227 | -1.288 | 1.344 | 0.252 | -0.059 |
| 186 | 0.892 | 0.068 | -0.584 | 0.933 | 228 | -0.804 | 0.834 | 0.809 | 0.338 |
| 187 | 1.982 | 0.579 | -0.027 | 2.123 | 229 | -1.046 | 1.089 | 0.530 | -1.249 |

Table Appendix E-1 (Continued)

| ID | Zdem | Zcont | Zsupp | Zstress | ID | Zdem | Zcont | Zsupp | Zstre |
|---|---|---|---|---|---|---|---|---|---|
| 188 | -3.105 | -0.442 | 0.252 | -1.943 | 230 | -0.077 | 0.579 | -0.027 | -0.059 |
| 189 | -0.440 | -1.208 | -0.584 | -1.051 | 231 | 0.044 | 0.068 | -0.305 | 1.627 |
| 190 | 0.650 | -0.187 | -0.862 | -0.357 | 232 | 1.861 | 0.834 | -0.027 | 0.933 |
| 191 | -0.198 | -1.973 | -0.305 | 0.338 | 233 | 0.407 | 1.089 | -1.976 | 0.437 |
| 192 | -0.925 | 0.579 | 2.201 | 0.834 | 234 | -0.925 | -0.187 | -0.305 | 0.734 |
| 193 | -1.651 | -0.442 | 2.201 | -0.257 | 235 | 0.165 | 0.579 | -0.027 | 0.139 |
| 194 | 0.044 | -0.187 | -0.027 | -0.059 | 236 | 1.255 | -0.442 | -0.027 | 1.429 |
| 195 | -0.804 | -0.187 | -0.027 | -0.852 | 237 | -0.198 | -1.463 | -0.305 | 0.933 |
| 196 | 0.407 | -0.187 | -0.305 | 1.131 | 238 | 0.044 | 0.834 | 0.252 | -0.753 |
| 197 | -0.198 | 0.068 | -0.027 | 0.437 | 239 | 0.044 | -0.187 | -0.862 | 0.834 |
| 198 | 0.892 | 0.324 | -0.027 | 0.338 | 240 | -0.804 | 0.579 | -0.862 | -1.150 |
| 199 | 2.103 | 0.579 | -0.027 | 2.024 | 241 | -1.409 | -0.187 | -0.027 | -1.547 |
| 200 | 0.407 | -0.952 | -1.698 | 0.734 | 242 | -1.288 | 2.620 | 2.201 | -1.448 |
| 201 | -0.561 | -0.442 | -0.027 | -0.753 | 243 | -0.683 | -0.952 | 0.530 | 0.437 |
| 202 | -0.319 | 0.834 | -0.027 | -0.456 | 244 | 0.044 | 0.579 | 0.252 | 0.040 |
| 245 | -0.804 | -0.952 | -0.027 | -2.241 | 261 | 1.618 | 1.089 | -1.141 | 2.520 |
| 246 | 0.044 | 2.365 | -0.027 | -1.051 | 262 | 1.134 | 0.579 | 1.366 | 1.230 |
| 247 | -1.409 | 0.834 | 0.252 | -0.158 | 263 | 1.618 | -0.187 | 0.252 | 0.139 |
| 248 | -0.440 | -0.187 | -0.305 | 0.040 | 264 | 1.376 | -1.208 | 1.644 | 0.834 |
| 249 | 1.013 | -0.442 | -0.862 | 0.834 | 265 | 0.529 | -1.718 | 0.530 | 1.825 |
| 250 | 0.771 | 2.620 | 2.201 | 0.338 | 266 | 1.376 | -0.187 | 2.201 | 1.429 |
| 251 | -1.046 | -0.442 | -0.027 | 0.437 | 267 | 0.892 | -0.187 | 0.809 | 0.139 |
| 252 | -0.683 | -0.952 | -0.305 | 0.536 | 268 | 0.650 | -0.187 | 1.644 | 1.528 |
| 253 | 0.892 | 0.068 | 1.366 | 1.230 | 269 | 0.771 | -0.187 | -0.027 | 1.330 |
| 254 | 1.618 | 0.579 | 0.252 | 0.834 | 270 | -0.319 | 1.344 | 2.201 | -0.456 |
| 255 | -0.198 | -0.187 | -0.027 | -1.547 | 271 | 0.771 | 0.068 | 1.087 | 0.635 |
| 256 | -0.561 | 0.579 | -0.027 | 0.338 | 272 | -0.198 | -0.187 | -0.027 | 1.429 |

Table Appendix E-1 (Continued)

| ID | Zdem | Zcont | Zsupp | Zstress | ID | Zdem | Zcont | Zsupp | Zstre |
|---|---|---|---|---|---|---|---|---|---|
| 257 | 1.255 | -1.208 | -0.027 | -0.257 | 273 | -0.561 | -0.952 | -0.305 | 1.230 |
| 258 | -1.288 | -0.952 | -0.305 | -0.852 | 274 | -0.319 | -0.442 | 0.252 | 0.834 |
| 259 | 0.650 | -2.228 | -3.369 | -0.654 | 275 | 0.407 | 1.089 | 2.201 | -1.150 |
| 260 | 0.286 | -1.718 | -1.141 | 0.834 | 276 | -0.077 | -0.697 | -0.027 | -0.654 |
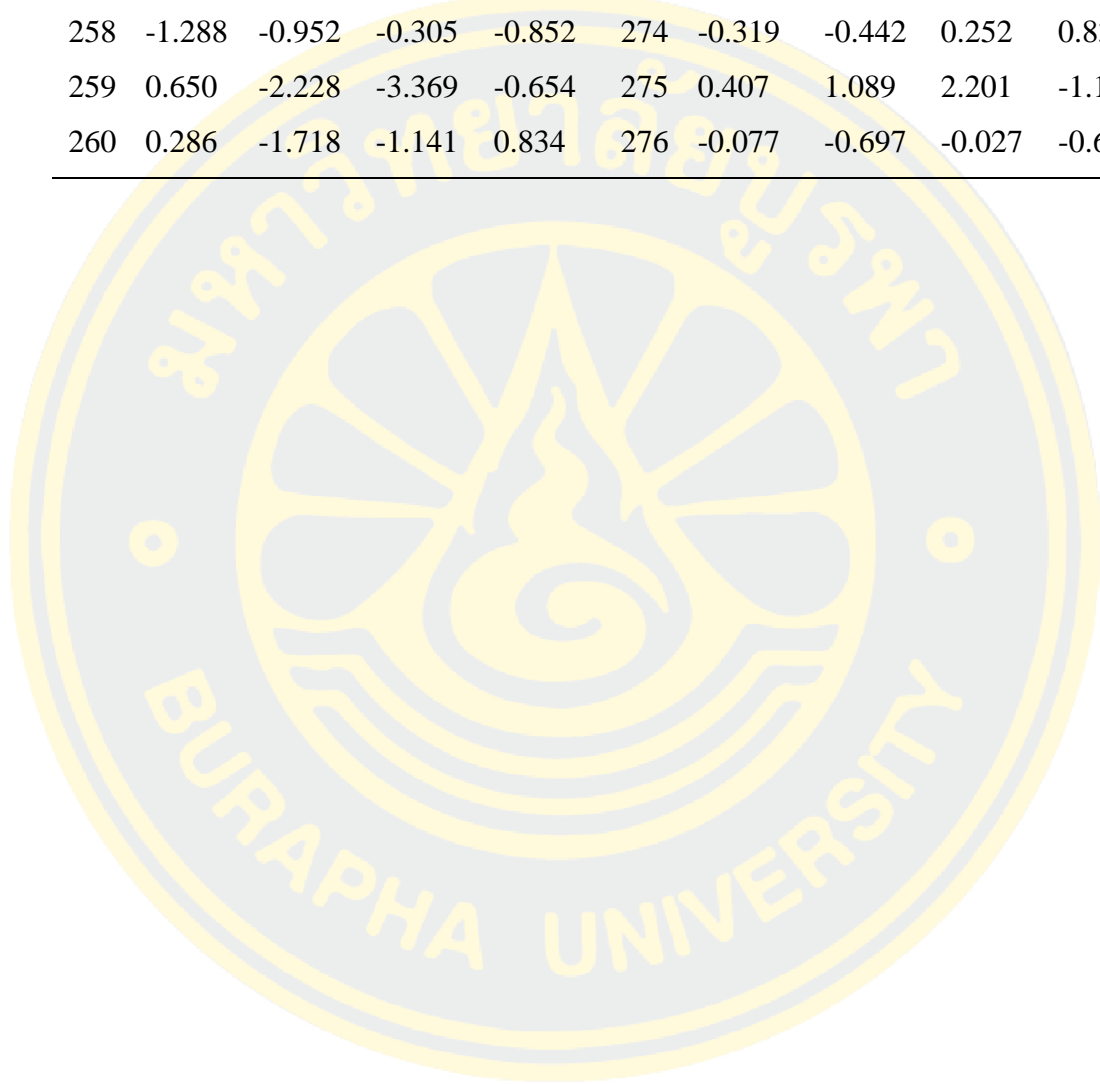
Table Appendix E-2 Multivariate outliers

| ID | P_MAH | ID | P_MAH | ID | P_MAH | ID | P_MAH |
|----|-------|----|-------|----|-------|----|-------|
| 1 | 0.6657 | 41 | 0.9753 | 81 | 0.2170 | 121 | 0.4723 |
| 2 | 0.4450 | 42 | 0.5844 | 82 | 0.0006 | 122 | 0.4893 |
| 3 | 0.5558 | 43 | 0.9437 | 83 | 0.6745 | 123 | 0.3196 |
| 4 | 0.9520 | 44 | 0.6411 | 84 | 0.9936 | 124 | 0.2268 |
| 5 | 0.7610 | 45 | 0.9974 | 85 | 0.9024 | 125 | 0.4515 |
| 6 | 0.1169 | 46 | 0.8661 | 86 | 0.9206 | 126 | 0.9268 |
| 7 | 0.1604 | 47 | 0.7217 | 87 | 0.7610 | 127 | 0.7485 |
| 8 | 0.4297 | 48 | 0.6351 | 88 | 0.1550 | 128 | 0.1268 |
| 9 | 0.2206 | 49 | 0.8419 | 89 | 0.8154 | 129 | 0.9395 |
| 10 | 0.0126 | 50 | 0.7542 | 90 | 0.0617 | 130 | 0.8871 |
| 11 | 0.3126 | 51 | 0.7263 | 91 | 0.0165 | 131 | 0.8075 |
| 12 | 0.9714 | 52 | 0.9970 | 92 | 0.0668 | 132 | 0.4172 |
| 13 | 0.8647 | 53 | 0.9980 | 93 | 0.3914 | 133 | 0.0435 |
| 14 | 0.9959 | 54 | 0.9847 | 94 | 0.7776 | 134 | 0.6369 |
| 15 | 0.8568 | 55 | 0.9536 | 95 | 0.9936 | 135 | 0.8871 |
| 16 | 0.4935 | 56 | 0.7277 | 96 | 0.2378 | 136 | 0.3428 |
| 17 | 0.4808 | 57 | 0.0139 | 97 | 0.0167 | 137 | 0.9268 |
| 18 | 0.6817 | 58 | 0.8419 | 98 | 0.1832 | 138 | 0.1402 |
| 19 | 0.4738 | 59 | 0.9568 | 99 | 0.1475 | 139 | 0.9686 |
| 20 | 0.6745 | 60 | 0.9696 | 100 | 0.7610 | 140 | 0.4344 |
| 21 | 0.8724 | 61 | 0.0079 | 101 | 0.5709 | 141 | 0.1246 |
| 22 | 0.0098 | 62 | 0.8278 | 102 | 0.5421 | 142 | 0.9695 |
| 23 | 0.8820 | 63 | 0.1799 | 103 | 0.2906 | 143 | 0.0398 |
| 24 | 0.0776 | 64 | 0.8675 | 104 | 0.0668 | 144 | 0.9847 |
| 25 | 0.8647 | 65 | 0.3409 | 105 | 0.8232 | 145 | 0.2537 |
| 26 | 0.3481 | 66 | 0.0924 | 106 | 0.1813 | 146 | 0.9268 |
| 27 | 0.0811 | 67 | 0.9141 | 107 | 0.6009 | 147 | 0.6127 |
| 28 | 0.8988 | 68 | 0.7502 | 108 | 0.8026 | 148 | 0.9437 |

Table Appendix E-2 (Continued)

| ID | P_MAH | ID | P_MAH | ID | P_MAH | ID | P_MAH |
|-----|--------|-----|--------|-----|--------|-----|--------|
| 29 | 0.7824 | 69 | 0.9166 | 109 | 0.6127 | 149 | 0.8647 |
| 30 | 0.7240 | 70 | 0.8875 | 110 | 0.1136 | 150 | 0.2781 |
| 31 | 0.9731 | 71 | 0.3930 | 111 | 0.4540 | 151 | 0.6468 |
| 32 | 0.9897 | 72 | 0.7772 | 112 | 0.9616 | 152 | 0.4999 |
| 33 | 0.6333 | 73 | 0.1620 | 113 | 0.3497 | 153 | 0.4475 |
| 34 | 0.9959 | 74 | 0.0091 | 114 | 0.8426 | 154 | 0.0615 |
| 35 | 0.9127 | 75 | 0.1399 | 115 | 0.8202 | 155 | 0.0608 |
| 36 | 0.9731 | 76 | 0.1640 | 116 | 0.9568 | 156 | 0.7502 |
| 37 | 0.3639 | 77 | 0.9091 | 117 | 0.5426 | 157 | 0.7159 |
| 38 | 0.2412 | 78 | 0.6423 | 118 | 0.9997 | 158 | 0.4572 |
| 39 | 0.7072 | 79 | 0.9730 | 119 | 0.1022 | 159 | 0.0272 |
| 40 | 0.9091 | 80 | 0.3846 | 120 | 0.4281 | 160 | 0.9936 |
| 161 | 0.6134 | 190 | 0.7967 | 219 | 0.3800 | 248 | 0.9471 |
| 162 | 0.7529 | 191 | 0.2259 | 220 | 0.1358 | 249 | 0.6892 |
| 163 | 0.4242 | 192 | 0.1555 | 221 | 0.8562 | 250 | 0.0178 |
| 164 | 0.0620 | 193 | 0.0327 | 222 | 0.8932 | 251 | 0.7003 |
| 165 | 0.7824 | 194 | 0.9980 | 223 | 0.8341 | 252 | 0.6698 |
| 166 | 0.9959 | 195 | 0.8647 | 224 | 0.4696 | 253 | 0.3095 |
| 167 | 0.6794 | 196 | 0.9745 | 225 | 0.9200 | 254 | 0.3439 |
| 168 | 0.0340 | 197 | 0.9970 | 226 | 0.7281 | 255 | 0.9936 |
| 169 | 0.5046 | 198 | 0.8050 | 227 | 0.3333 | 256 | 0.8650 |
| 170 | 0.8523 | 199 | 0.1622 | 228 | 0.7187 | 257 | 0.3534 |
| 171 | 0.3644 | 200 | 0.3993 | 229 | 0.5638 | 258 | 0.4031 |
| 172 | 0.6954 | 201 | 0.9001 | 230 | 0.9343 | 259 | 0.0069 |
| 173 | 0.4268 | 202 | 0.8109 | 231 | 0.9865 | 260 | 0.3676 |
| 174 | 0.0277 | 203 | 0.3859 | 232 | 0.2030 | 261 | 0.0903 |
| 175 | 0.8875 | 204 | 0.8996 | 233 | 0.0380 | 262 | 0.2635 |
| 176 | 0.5258 | 205 | 0.1125 | 234 | 0.7707 | 263 | 0.3833 |

Table Appendix E-2 (Continued)

| ID | P_MAH | ID | P_MAH | ID | P_MAH | ID | P_MAH |
|----|-------|----|-------|----|-------|----|-------|
| 177 | 0.0430 | 206 | 0.9686 | 235 | 0.9276 | 264 | 0.0189 |
| 178 | 0.7462 | 207 | 0.9786 | 236 | 0.6109 | 265 | 0.1571 |
| 179 | 0.7892 | 208 | 0.8353 | 237 | 0.5005 | 266 | 0.0209 |
| 180 | 0.4594 | 209 | 0.6252 | 238 | 0.8674 | 267 | 0.5458 |
| 181 | 0.8075 | 210 | 0.6718 | 239 | 0.8495 | 268 | 0.2020 |
| 182 | 0.4896 | 211 | 0.5772 | 240 | 0.4286 | 269 | 0.8871 |
| 183 | 0.7199 | 212 | 0.0587 | 241 | 0.5408 | 270 | 0.1661 |
| 184 | 0.5785 | 213 | 0.7757 | 242 | 0.0303 | 271 | 0.4968 |
| 185 | 0.7748 | 214 | 0.7968 | 243 | 0.4999 | 272 | 0.9936 |
| 186 | 0.7767 | 215 | 0.9959 | 244 | 0.9506 | 273 | 0.7121 |
| 187 | 0.2025 | 216 | 0.5408 | 245 | 0.6086 | 274 | 0.9152 |
| 188 | 0.0160 | 217 | 0.0000 | 246 | 0.0752 | 275 | 0.1283 |
| 189 | 0.6057 | 218 | 0.0107 | 247 | 0.4655 | 276 | 0.8996 |

# BIOGRAPHY

**NAME**            Pol.Capt. Sirinthip Boonduaylan

**DATE OF BIRTH**   May 26, 1978

**PLACE OF BIRTH**  Pattani, Thailand

**PRESENT ADDRESS** 99/95 Thanyapirom, Rangsit-Nakhon nayok Road,
Thanyaburi, Pathum Thani, Thailand, 12110

**POSITION HELD**   2001-2007     Registered Nurse
Police General Hospital, Bangkok, Thailand
2007-2014     Registered Nurse
HRH Princess Maha Chakri Sirindhorn
Medical Center, Nakornnayok Province,
Thailand
2014-present  Lecturer
Faculty of Nursing,
Srinakharinwirot University
Nakornnayok Province, Thailand

**EDUCATION**       1997-2001     Bachelor of Nursing Science,
Police Nursing College, Thailand
2010-2012     Master of Nursing Science
(Nursing Asministration)
Eastern Asia University, Pathum Thani,
Thailand
2017-2021     Doctor of Philosophy in Nursing Science
(International Program)
Burapha University, Thailand