



**Family Hardiness, Social Support, and Well-Being of Thai Traumatic
Brain Injury Family Caregivers**

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Degree of Master of Nursing Science (International Program)**

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Thesis Title Family Hardiness, Social Support, and Well-Being of Thai
Traumatic Brain Injury Family Caregivers

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ABSTRACT

This study aimed to examine the level of family hardiness, social support, well-being, and the relationships between family hardiness, social support, and well-being among TBI family caregivers. The Family Resiliency Model of Family Stress, Adjustment, and Adaptation was used to guide this study. Ninety-eight TBI family caregivers were purposively selected from neurosurgical outpatient departments of two tertiary government hospitals in the southern part of Thailand. The set of questionnaires consisted of the Demographic Data Form of Family Caregivers and TBI Persons, the Family Hardiness Index (FHI), the Social Support Index (SSI), and the Family Member Well-being Index (FMWB). The validity and reliability test of these questionnaires were completed and the reliability showed Cronbach's alpha coefficient for the FHI, SSI, and FMWB of .70, .80, and .80, respectively. Descriptive statistics and Pearson's product moment correlation coefficient were used to analyze the data.

The findings showed that the family hardiness and the social support were at a high level. The TBI family caregivers' well-being was found at a moderate

level. There were no significant relationships between family hardiness ($r = .004$, $p > .05$), social support ($r = .09$, $p > .05$) and TBI family caregivers' well-being.

The current findings can be used to plan to enhance a good appraisal and commitment of caregiving to empower a family caregiver's internal strength. Moreover, these findings will be important for health care providers to provide education about a patient's illness management and promote informal network support to decrease tension and maintain the well-being of TBI family caregivers.

ชื่อวิทยานิพนธ์	ความเข้มแข็งของครอบครัว การสนับสนุนทางสังคม และความผาสุก ของญาติผู้ดูแลผู้บาดเจ็บศีรษะในประเทศไทย
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บทคัดย่อ

การศึกษานี้มีวัตถุประสงค์เพื่อศึกษาระดับความเข้มแข็งของครอบครัว การสนับสนุนทางสังคม ความผาสุก และความสัมพันธ์ระหว่างความเข้มแข็งของครอบครัว การสนับสนุนทางสังคม และความผาสุกในญาติผู้ดูแลผู้บาดเจ็บศีรษะในประเทศไทย โดยใช้กรอบแนวคิด The Family Resiliency Model of Family Stress, Adjustment, and Adaptation กลุ่มตัวอย่างเป็นญาติผู้ดูแลของผู้บาดเจ็บศีรษะซึ่งถูกคัดเลือกแบบเจาะจงจำนวน 98 คนจากคลินิกผู้ป่วยนอก ศัลยกรรมประสาท โรงพยาบาลรัฐระดับตติยภูมิจำนวนสองแห่งในภาคใต้ ประเทศไทย การเก็บข้อมูลใช้แบบสอบถาม ประกอบด้วย แบบสอบถามข้อมูลส่วนบุคคลของญาติผู้ดูแลและผู้บาดเจ็บศีรษะ แบบสอบถามความเข้มแข็งของครอบครัว แบบสอบถามการสนับสนุนจากชุมชน และแบบสอบถามความผาสุกของญาติผู้ดูแล แบบสอบถามดังกล่าวได้นำมาทดสอบหาความตรงเชิงเนื้อหาและความเชื่อมั่นสอดคล้องภายใน โดยค่าความเชื่อมั่นครอนบาคอัลฟาของแบบสอบถามความเข้มแข็งของครอบครัว การสนับสนุนจากชุมชน และความผาสุกของญาติผู้ดูแล เท่ากับ .70, .80 และ .80 ตามลำดับ วิเคราะห์ข้อมูลโดยใช้สถิติเชิงบรรยายและสัมประสิทธิ์สหสัมพันธ์ของเพียร์สัน

ผลการวิจัยพบว่า ความเข้มแข็งของครอบครัวและการสนับสนุนทางสังคมโดยรวมอยู่ในระดับสูง ความผาสุกโดยรวมของญาติผู้ดูแลอยู่ในระดับปานกลาง และไม่มีความสัมพันธ์ระหว่างความเข้มแข็งของครอบครัวกับความผาสุกของญาติผู้ดูแล ($r = .004, p > .05$) และการสนับสนุนทางสังคมกับความผาสุก ($r = .086, p > .05$)

ผลการศึกษาครั้งนี้เจ้าหน้าที่สุขภาพสามารถนำไปใช้ในการวางแผนการส่งเสริม
การประเมินสถานการณ์และความมุ่งมั่นในการดูแลที่ดีเพื่อเสริมสร้างความเข้มแข็งภายในของญาติ
ผู้ดูแล รวมทั้งการให้ความรู้เกี่ยวกับการจัดการความเจ็บป่วยของผู้ป่วยและการสร้างเครือข่ายไม่
เป็นทางการแก่ญาติผู้ดูแลเพื่อลดความเครียดและคงไว้ซึ่งความผาสุกของญาติผู้ดูแล

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Chapter 1

Introduction

Background and Significance of the Problem

Traumatic brain injury (TBI) is a common worldwide problem and is the leading cause of mortality and disability among children and adults. The global statistics of TBI is expected to rise with the increase of road traffic injuries from the ninth leading cause of mortality to the fifth in the year 2030 (Curry, Ramaiah, & Vavilala, 2011). It is estimated that around 1.7 million of Americans each year experience TBI and there are 5.3 million Americans living with a long-term disability with TBI (Dillahunt-Aspillaga et al., 2013; Tabish & Syed, 2014). In addition, the highest number of TBI cases has been found in Asia with approximately 344 cases per 100,000 of the population which has mostly resulted from motor vehicle accidents (Tabish & Syed, 2014). In Thailand, the mortality rate of TBI was 12,767 cases per 100,000 of the population in 2015 (Bureau of Non Communicable Diseases of Thailand, 2016). Therefore, it is essential to optimize TBI care by developing the advancement of prehospital trauma care for improving the outcome of Thai TBI patients.

Although advances in medical and nursing practice can improve the survival of TBI victims, those with moderate to severe injury experience extensive health problems which include physical, cognitive, emotional and behavioral aspects (Andruszkow et al., 2014; Grauwmeijer, Heijenbrok-Kal, Haitisma, & Ribbers, 2012;

Trevena & Cameron, 2011). In addition, the direct impacts of TBI produce disabilities that limit persons' performance of activities in daily living such as moving, eating, bathing, walking, working, thinking, remembering, or communicating. Many complications after sustaining TBI also occur; for example, seizures, pressure ulcers, infections, and headaches. These problems can lead to TBI persons needing continuous care (Australian Institute of Health and Welfare [AIHW], 2007).

Since TBI persons are discharged with disabilities, these disabilities have indirect effects on family members, especially for family caregivers who have to provide care to fulfill the TBI persons' demands (Kreutzer et al., 2009). Caring for TBI persons in the short and long term can impact on the family caregivers' health including physical, psychological, and socioeconomic aspects. The physical health problems included sleeplessness, fatigue, headaches, and hypertension (Evans, 2011; Livingston et al., 2010). The psychological health problems included fear, anxiety, depression, stress, and burden (Arango-Lasprilla et al., 2011; Evans, 2011; Sung et al., 2013). Moreover, the socioeconomic impacts were unemployment, role changes, and reductions in social participation (Arango-Lasprilla et al., 2011). These impacts may result in decreasing the well-being of family caregivers (Livingston et al., 2010; Sung et al., 2013).

Previously, the Family Resiliency Model of Family Stress, Adjustment, and Adaptation was used in the studies of families with crisis stress (McCubbin & McCubbin, 2001). Based on this model, caring for TBI persons with chronic conditions can result in family caregivers facing stressful caregiving situations. To adapt or adjust well and have well-being for the family caregiver while caring for a TBI person in the short or long term, internal and external resources of a

family system including family hardiness and social support are necessary (McCubbin & McCubbin, 2001).

Family hardiness is referred to as the internal strengths and durability of the family that functions on buffering the effects of stressors or demands (McCubbin & McCubbin, 2001). The previous studies in Thailand and other countries have explored family hardiness in several types of family caregivers, such as stroke patients (Niyomthai, Putwatana, & Panpakdee, 2003), disabled adults (Clark, 2002), and mentally ill persons (Puasiri, Sittthimongkol, Tilokskulchai, Sangon, & Nityasuddhi, 2011; Whitten, 2009). These studies showed that the overall family hardiness ranged from moderate to high levels.

In addition, social support is the community-based or external resources involving individuals, groups, and institutional support from outside the family. The family caregivers could access social support to meet their demands because social support has the ability to protect persons from the effects of stressors and promote family recovery from crisis situations (McCubbin & McCubbin, 2001). In 2006, Kaewsriwong studied Thai TBI family caregivers and found that they had high levels of social support. Considering the domain in social support, the opportunity for the nurturance domain has the highest score, while the lowest score is the domain of the sense of reliable alliance. Moreover, previous studies have also examined the social support level among different groups of family caregivers, such as stroke (Prombut, Piaseu, & Sakulhongsopon, 2014), Alzheimer (Huang et al., 2009), and spinal cord injury caregivers (Rattanasuk, Nantachaipan, Sucamvang, & Moongtui, 2013). They showed that the caregivers had low to high levels of social support.

The different levels of family hardiness and social support have been found to be the influences for family caregivers to adapt to stressful conditions and maintain their well-being. The family members' well-being has been recognized as an important health outcome from the adaptation process (McCubbin & McCubbin, 2001) which is the individual's evaluation of his/her life conditions including the emotional and physical conditions (National Center for Chronic Disease Prevention and Health Promotion [NCDC], 2013). Previous studies were done in western countries regarding TBI caregivers' well-being (Kreutzer et al., 2009; Livingston et al., 2010; McAllister et al., 2012). Kreutzer et al (2009) found that TBI caregivers had high emotional distress and quite low life satisfaction at one, two, and five years post their patients' injuries. Similarly, a low well-being level was found in a study of family caregivers after a TBI patient's discharge at one and two years (Livingston et al., 2010). McAllister et al. (2012) also found that caregivers of injured persons who had also sustained a TBI had low levels of well-being. In Thailand, well-being has been explored in family caregivers of patients with chronic illness, such as stroke caregivers (Charnsri, 2008; Jaroonsit, 2011), and spinal cord injury caregivers (Rattanasuk et al., 2013). These studies showed moderate to high levels of family caregivers' well-being.

In addition, previous studies showed that family hardiness positively correlated with the well-being of several types of family caregivers; for example, stroke (Niyomthai et al., 2003), schizophrenia (Pongsitthisak, 2003), and mothers of Autism Spectrum Disorder children (Weiss et al., 2013). Moreover, a positive relationship between social support and well-being has been found in studies of

caregivers, such as caregivers of family members with TBI (Ergh et al., 2003), stroke (Jaroonsit, 2011), and spinal cord injury (Rattanasuk et al., 2013).

Among the previous studies mentioned above, the majority of these have been conducted in western family caregivers caring for persons with neurological and/or mental health problems. These results of the levels of family hardiness, social support, and the well-being of the caregivers were inconclusive. This may be caused by diverse sociocultural situations and different types of patients. For TBI, family caregivers have to take care of the TBI person who has physical and cognitive disabilities and requires long-term recovery. This situation contributes to increased caregivers' stress and demands which impacts on the caregivers' hardiness and social support factors in managing their stressful caregiving situation to balance or maintain their well-being. In Thailand; however, the existing knowledge about family hardiness, social support, and the well-being of family caregivers who care for TBI persons at home is scarce. It is, therefore, necessary to study family hardiness, social support, and well-being, and the relationship of well-being among Thai TBI family caregivers. The findings of this current study may be helpful to provide basic information for health professionals to gain an understanding regarding family hardiness, social support, well-being, and the relationship of well-being. Consequently, health professionals can promote family hardiness and social support and maintain the well-being of TBI family caregivers.

Objectives of the Study

The objectives of this study were:

1. To examine the level of well-being of TBI family caregivers.
2. To examine the level of family hardiness of TBI family caregivers.
3. To examine the level of social support of TBI family caregivers.
4. To examine the relationship between family hardiness and well-being of TBI family caregivers.
5. To examine the relationship between social support and well-being of TBI family caregivers.

Research Questions

The research questions of this study were:

1. What is the level of well-being of TBI family caregivers?
2. What is the level of family hardiness of TBI family caregivers?
3. What is the level of social support of TBI family caregivers?
4. Is there any relationship between family hardiness and well-being of TBI family caregivers?
5. Is there any relationship between social support and well-being of TBI family caregivers?

Conceptual Framework of the Study

This study used two frameworks to guide the study. The first is the Family Resiliency Model of Family Stress, Adjustment, and Adaptation (McCubbin & McCubbin, 2001; VanBreda, 2001). The second is the literature of the concept of well-being (Diener et al., 2003; Diener & Suh, 1997; Harris, 2009; NCDC, 2013).

According to the Family Resiliency Model, resilience is defined as the positive behavioral patterns and functional competence of the individual and the family unit that are demonstrated under stressful situations. It determines the family's ability to recover by maintaining the integrity of the family unit while ensuring and where necessary to restoring the well-being of family members and the family unit (McCubbin & McCubbin, 2001; VanBreda, 2001). In addition, since this model is focused on the family as the system with limited explanation specific on the family caregiver, therefore, within the general explanation of this model, the primary family caregiver could be assumed to be one of the family members.

The Family Resiliency Model consists of two phases; the adjustment phase and adaptation phase (McCubbin & McCubbin, 2001; VanBreda, 2001). In the adjustment phase, the family has only minor changes in how it typically operates and behaves. This phase consists of: (1) stressor; (2) the family's vulnerability; (3) the family typology; (4) family resistance resource; (5) the family's appraisal of the stressor; and (6) the family's problem solving and coping abilities. In the adaptation phase, a family has the progress of maladjustment from a chronic illness situation and other family life events which can increase the hardship severity in the family. The elements of this phase include: (1) the pile-up of demands on or in the family which

are produced by illness, family life-cycle change, and unresolved strains; (2) the family typology; (3) the family's own internal resources and capabilities (e.g., hardiness, coalition, respect, support); (4) the family's network of social support (e.g., extended family, friends, and community); (5) the family's situation appraisal; and (6) family problem solving and coping abilities. All of these components work in relation to each other (McCubbin & McCubbin, 2001; VanBreda, 2001). The positive result from the process of these two phases is the balance and harmony of family members which is included in the general family members' well-being (bonadjustment and bonadaptation) (McCubbin & McCubbin, 2001; VanBreda, 2001).

Based on this model, the adaptive phase was focused since it is related to family hardiness and social support. In addition, this study was conducted in TBI family caregivers post patient hospital discharge, so the patient was not in the crisis illness stage or in the adjustment phase. However, the well-being of family caregiver was mostly affected in the adaptive phase due to the chronic illness of the family member, as well as the pile-up of the stressors and all the demands in the long-term (McCubbin & McCubbin, 2001; VanBreda, 2001). Hence, these two variables were linked to the well-being of family caregivers in the conceptual framework of this study.

After sustaining a TBI, there are many impacts on the TBI person including physical, cognitive, emotional and behavioral health leading to limitations and disabilities (Andelic et al., 2010; Benedictus et al., 2010; Grauwmeijer et al., 2012; Trevena & Cameron, 2011). The TBI persons who are discharged from hospital to home with a functional disability are more likely to have behavioral problems, dependency, and a negative effect on family members, especially the family caregiver

who takes the main responsibility role in caring for them (Kreutzer et al., 2009; Livingston et al., 2010). During the caregiving process, the family caregivers are faced with many stressful situations due to their own and the TBI person's problems. As a result, this situation contributed to the multiple stressors for the caregiver. Due to family caregivers having to face these multiple stressors and demands during this caring process, family hardiness and social support are the protective factors for them in the adaptation phase (VanBreda, 2001).

Family hardiness has been included as the component of a family's own internal resistance resource (McCubbin & McCubbin, 2001). The family resistance resource is described as a family's ability and capability to address and manage the stressors and their demands, and to maintain or promote harmony and balance, and substantial change in the family. Family hardiness is composed of four interrelated components: (1) co-oriented commitment, the family working together to handle difficulties; (2) confidence, the family's sense of being able to handle problems and endure hardships; (3) challenge, the family's ability to view hardships as challenges and produce growth; and (4) control, the family's sense of being in control of life rather than victims of circumstance or controlled by life situations (McCubbin & McCubbin, 2001; VanBreda, 2001).

According to these components of family hardiness, family hardiness can help family caregivers to adjust and adapt over time. The hardiness is represented as the internal resource that collects the strengths of the family to cope with circumstantial change, which can reflect family adaptation (VanBreda, 2001). The family members use this internal resource and with effort bring a new level of balance, harmony, coherence, and functioning to a stressful or crisis family situation.

Demand balance within the family can lead to success in adaptation. Success in family adaptation indicates a high level of individual and family well-being (McCubbin & McCubbin, 2001; VanBreda, 2001). To support this conclusion, a previous study showed that a success in family adaptation is associated with high levels of caregivers' well-being (Riper, 2007). Thus, the family hardiness may be also related to the TBI family caregivers' well-being.

In addition, social support has been included in the family's network of social support for the adaptive phase. It refers to community-based resources from a person, group, and institution. The family caregivers can access any type and level of support from external resources to meet their demands. This was conceptualized based on three main components: (1) emotional support; (2) esteem support; and (3) network support (Cobb, 1976; McCubbin & McCubbin, 2001). This social support can help the caregivers to manage their caregiving situation. Those who have enough social support usually perceive fewer problems in the caregiving processes due to the buffering effect of social support to stressful situations (Rattanasuk et al., 2013). It also can shorten the time caregivers deal with any problems due to the caregivers having more adaptive power (Rattanasuk et al., 2013; VanBreda 2001). Whenever a caregiver has a high level of social support, there will be a high level of well-being (Au et al., 2009). Therefore, social support may have a relationship with TBI family caregivers' well-being.

The model and the literature, as mentioned before, are focused on the well-being, since it is an important health outcome for the caregivers and can be affected by caring for TBI patients. The previous literature of caregivers' well-being has defined well-being based on the subjective dimension (Harris, 2009; Kreutzer et

al., 2009; Lu et al., 2015). Well-being is referred to as the individual evaluation of his/her life conditions including the emotional and physical conditions (Diener et al., 2003; Diener & Suh, 1997; NCDC, 2013). Furthermore, well-being can be appraised or perceived based on his/her experiences that come through the caregiving processes. The individual's life conditions and affective conditions can be presented as positive or negative (Diener et al., 2003; Diener & Suh, 1997; Harris, 2009; NCDC, 2013).

According to the Family Resiliency Model and the literature review, family caregivers can manage the stressors by using the protective factors of the adaptive phase including family hardiness and social support. Finally, the family caregivers may improve their well-being in the positive changes. Thus, family hardiness, social support, well-being, the relationships between family hardiness, social support and the well-being of TBI caregivers, were examined in this study. The framework of these relationships is shown in figure 1.

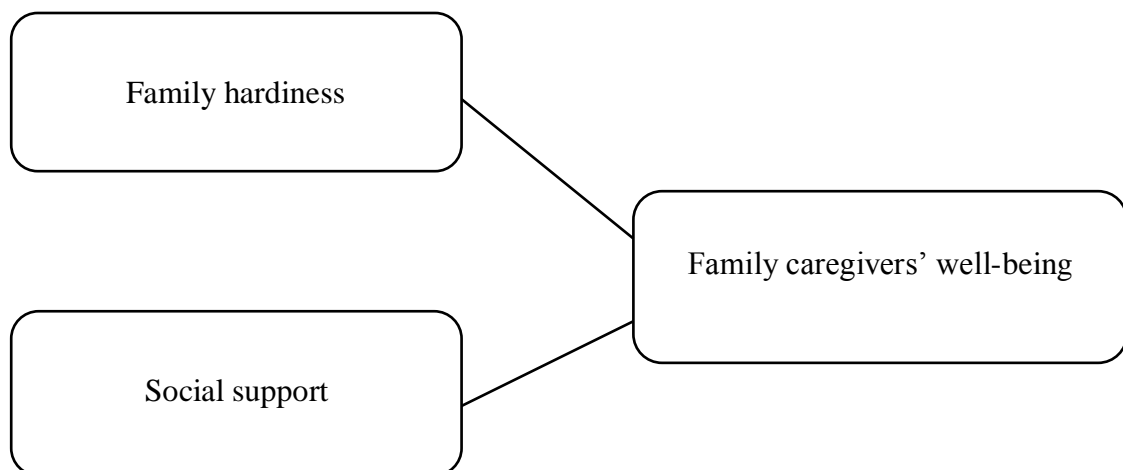


Figure 1. Conceptual Framework of the Study

Research Hypotheses

The hypotheses of this study were:

1. There is a positive relationship between the family hardiness and well-being of TBI family caregivers.
2. There is a positive relationship between the social support and well-being of TBI family caregivers.

Definition of Terms

The definitions of terms used in this study were as follows:

Family hardiness. Family hardiness is defined as the family caregiver's perception of his or her own internal strengths and resources when he or she is facing stressful caregiving situations. It consists of the four components of co-oriented commitment, confidence, challenge, and control. Family hardiness was measured by using the Family Hardiness Index (FHI), which was developed by Marilyn McCubbin, Hamilton McCubbin, and Anne Thomson in 1986 (McCubbin, Thompson, & McCubbin, 2001). The FHI that was translated into the Thai version by Niyomthai et al. (2003) was used in the study. A high score means a high level of family hardiness.

Social support. Social support is defined as any support, which comes from external resources or community-based resources as perceived by the family caregiver while caring for the TBI person. Social supports consisted of (1) emotional support, which lead to the individual belief that he/she is cared for and loved, such as

the provision of empathy; love; trust; care; affect; concern; and being listened to, (2) esteem support, which lead to the individual belief that he/she is esteemed and valued, and (3) network support, which lead to the individual belief that he/she belongs to a network of communication involving mutual obligation and mutual understanding. The Social Support Index (SSI) in the Thai version, which was translated and modified by Rungreangkulkit (2000) from the original SSI (McCubbin, Patterson, & Glynn, 1982 as cited in McCubbin et al., 2001), was used to measure social support in this study. A high score means a high level of social support (McCubbin et al., 2001).

Well-being. Well-being is defined as the family caregivers' evaluation of his/her life condition regarding the overall emotional and physical condition while caring for a TBI person. The emotional and physical conditions consisted of general health, tension, energy, cheerfulness, fear, anger, sadness, and a member's health concerns. The Family Member Well-Being Index (FMWB) was developed by Hamilton McCubbin and Joan Patterson in 1982 (McCubbin et al., 2001). The FMWB was translated into the Thai version (Niyomthai et al., 2003) and was used to measure family caregivers' well-being in this study. A high score means a high level of well-being.

Scope of the Study

This descriptive correlational study was aimed to examine the level of family hardiness, social support, and well-being of Thai TBI family caregivers and to determine the relationships between family hardiness, social support, and TBI family caregivers' well-being. The family caregiver is referred to as a person who took a

major role in taking care of a TBI family member without pay. The data were collected from 98 family caregivers of TBI persons recruited from neurosurgical outpatient departments of two tertiary government hospitals in the southern part of Thailand. The data collection was from January to June, 2016.

Significances of the Study

The results of this study would provide the following information:

1. Provide useful information for health professionals to enhance family hardiness, social support, and well-being of family caregivers of TBI persons.
2. Obtain baseline data for further development of research on issues related to factors of well-being of TBI family caregivers or interventions for maintaining or increasing the well-being of TBI family caregivers.

Chapter 2

Literature Review

This chapter presents the literature review related to traumatic brain injury and its impacts, the Family Resiliency Model, family hardiness, social support, and well-being of TBI family caregivers. The relationships between family hardiness, social support and well-being are also reviewed. This literature review is shown as follows.

1. Overview of traumatic brain injury and its impacts
2. Traumatic brain injury care in Thailand
3. The Family Resiliency Model of Family Stress, Adjustment, and Adaptation
4. Family hardiness of TBI family caregivers
5. Social support of TBI family caregivers
6. Well-being of TBI family caregivers
7. Relationships between family hardiness, social support, and well-being of TBI family caregivers
8. Summary of literature review

Overview of Traumatic Brain Injury and Its Impacts

Overview of Traumatic Brain Injury

Traumatic brain injury (TBI) is defined as sudden head trauma which is a non-degenerative and non-congenital insult to the brain. It is the results from the external forces radically hitting an object, blow, jolt, or penetrating the skull leading to damage the brain with an alteration of normal brain function (Brain Injury Association of America [BIAA], 2012; Centers for Disease Control and Prevention [CDC], 2015; National Institute of Neurological Disorders and Stroke [NINDS], 2015).

The alterations of brain functions include any periods of loss of or decreased levels of consciousness (LOC), any losses of memory of events suddenly before or after the injury, neurologic deficits (e.g., sensory loss, weakness, and aphasia), and/or any alterations in mental state at the time of injury (e.g., slowed thinking, disorientation, and irritability) (Menon, Schwab, Wright, & Maas, 2010). Hence, the brain functional alterations or other pathologies are cognitive, emotional, and physical functioning disturbances of the person (BIAA, 2012).

The severity of TBI has been classified into mild, moderate, and severe levels. According to the Glasgow Coma Scale (GCS), three levels of severity are classified. The GCS range at 13-15, 9-12, and less than 9 are classified to mild, moderate, and severe TBI respectively (British Medical Journal [BMJ], 2015). Moreover, some researchers classified the severity of TBI based on the GCS, the duration of loss of LOC, and signs of post-traumatic amnesia (PTA). The 13-15

scores of GCS, less than 30 minutes of LOC, and/or less than one hour of PTA are classified as mild TBI. The 9-12 scores of GCS, 1-24 hours of LOC, and/or 30 minutes to 24 hours of PTA are classified as moderate TBI. Severe TBI includes less than 9 scores of GCS, more than 24 hours of LOC, and/or more than one day of PTA (Krausas as cited in Narkthong, 2014; Pangilinan, Kelly, & Hornyak, 2014).

In conclusion, TBI is defined as a trauma of the head caused from external forces leading to damage or alteration of brain functions and produces a change in physical, cognitive, and emotional aspects of an individual. The severity levels of TBI are mild, moderate, and severe.

The Impacts of TBI on Persons and Family Caregivers

A traumatic brain injury and its consequences can be lifelong for some persons and impact on physical, cognitive, and emotional, behavioral, and social health. Family caregivers and families play an important role in the rehabilitation process of an individual with TBI. However, the long term caregiving process impacts on the family caregivers' health.

The impacts of TBI on persons

The persons after TBI have to face significant life changes. They are living with negative impacts on physical, cognitive, and emotional, behavioral, and social health. The negative impacts and their intensities depend on injury locations and severity of injury (Imen et al., 2015; Institute of Medicine, 2011). These impacts are explained in the following:

Physical aspect

The physical problems commonly found annoying TBI persons are headaches, dizziness, nausea, vomiting, fatigue, and symptoms related to vision such as blurred vision, double vision, and sensitivity to light and noise (Lundin, de Bousard, Edman, & Borg, 2006; Trevena & Cameron, 2011; Upadhyay, 2008). These problems are linked to the poor physical health of the TBI persons in the long term after injury (Andelic et al., 2010; Polinder, Haagsma, van Klaveren, Steyerberg, & van Beeck, 2015; Yousefzade-Chabok et al., 2014).

Furthermore, physical limitations and dependence are related to the activities of daily living which are consequences after TBI (Australian Institute of Health and Welfare [AIHW], 2007; CDC, 2015). The research finding showed that TBI persons had a decreased employment rate from 80% pre-injury to 15% post-injury (Grauwmeijer et al., 2012) and 42% were not working (Andelic et al., 2010). Experience in decreasing leisure activity participation at one year post-injury due to motor and cognitive impairments was also found in TBI persons (Wise et al., 2010).

Additional to these physical limitations, the TBI persons were found to have complications influencing their life and recovery. The most common complications found were post-traumatic seizures, paralysis, spasticity, pressure sores, joint stiffness, deep vein thrombosis, respiratory infections, aspirate pneumonia, urinary tract infections, and constipation (CDC, 2015; Gainer, 2015).

Cognitive aspect

The cognitive impairment is a major impact after having sustained a brain injury, especially in moderate to severe brain injuries (Rabinowitz & Levin,

2014). The cognitive impairments are such as memory impairment or loss of memory, needing longer time for thinking, poor attention and concentration, impairment of reading or writing, difficulty in speech or finding the right words, difficulty in organizing or planning something, and poor decision making (Degeneffe, 2001; Trevena & Cameron, 2011; Upadhyay, 2008). The limitations of activities and employment are mainly caused from cognitive impairment of TBI persons. The cognitive problems are challenging for TBI persons to recover their brain functions back to a pre-injury level as they would like to (Grauwmeijer et al., 2012).

Emotional, behavioral, and social aspect

Emotional and behavioral impacts of TBI persons are expressed in terms of personality and behavioral changes. These changes range from minor to severe conditions, such as frustration, restlessness, sleep disturbance, irritability, aggressive outbursts, depression, anxiety, and posttraumatic stress disorder (Andruszkow et al., 2014; Grauwmeijer et al., 2012; Trevena & Cameron, 2011). Furthermore, the common psychiatric sequelae found in persons is major depression with a high rate after brain injury (Driver & Ede, 2009; Schwarzbald et al., 2008).

In addition, some TBI persons have difficulty with social relationships due to expressing inappropriate behaviors. The behavioral problems are commonly found in more than half of the TBI persons (Trevena & Cameron, 2011). They sometimes presented with aggressive behaviors which are a barrier to social relationships. Previous studies reported that TBI persons are more likely to experience change in social roles, social isolation, and limited social activities due to behavioral problems (Colantonio et al., 2004; Gainer, 2015).

The impacts of TBI are related to the severity level of the TBI, which can cause different health deteriorations. In mild TBI, individuals have reported physical, cognitive, and emotional or behavioral symptoms in the early phase after the injury (Ahman, Saveman, Styrke, Bjornstig, & Stalnacke, 2013; Dean & Sterr, 2013). Some persons with mild TBI have reported some disabilities in the long term and decreased quality of life due to persistent symptoms (Zumstein et al., 2011). On the other hand, the persons with moderate to severe TBI have more problems than those who have a less severity (Benedictus, Spikman, & Naalt, 2010; CDC, 2015). The literature showed high negative health outcomes for persons with moderate to severe TBI. This creates problems of high dependency and caring demands in the long period. The previous studies showed that an increased severity of the injury increases the magnitude of the impacts, causes significant high functional limitations, and high rehabilitation costs for many years after injury (Benedictus et al., 2010; Degeneffe, 2001; Gainer, 2015; Grauwmeijer et al., 2012).

In summary, physical, cognitive, and behavioral, emotional, and social impacts, which have been mentioned above, are the sequence of TBI. Continuing care is needed for TBI persons who have impairments, disabilities, and/or limitations, in particular the family caregivers of moderate to severe TBI persons. It is, therefore, challenging for the family caregiver to provide effective care for the family member with TBI and maintain their well-being.

The impact of TBI on family caregivers

After the TBI person has been discharged from hospital to home, some of the family members have a responsibility to take care of the TBI person as a family

caregiver. The family caregiver is referred to as the person who is one of the family members of the TBI person, such as a parent, child, spouse/partner, son/daughter-in-law, and grandfather/grandmother that has a major role in taking care of the TBI member without pay (do not receive a salary/rewards for their caring role) (National Alliance for Caregiving [NAC], 2010).

The family caregiver has a role to take care of the TBI person by fulfilling his/her physical and psychological needs as well as providing financial support because the TBI person has had to retire from work (Ennis et al., 2013; Kreutzer et al., 2009; NAC, 2010; Samartkit et al., 2010). Moreover, the family caregivers have to cope with the problems during the long-term recovery of TBI persons. The impacts on family caregivers are mostly due to having to work as the breadwinners, gaining more responsibilities regarding domestic work as well as work outside the home while caring for these patients (Chappell & Reid, 2002; Harris, 2009). In addition, in caring for patients with more dependency, the presence of complications and other illnesses could create more impacts on family caregivers and may lead them to become the hidden patients (Evans, 2011; Livingston et al., 2010). These can be explained in terms of the physical, psychological, and socioeconomic aspects (Arango-Lasprilla et al., 2011; DeBaillie, 2014; Evans, 2011; Livingston et al., 2010; Sung et al., 2013).

Physical aspect

The family caregivers had negative physical health due to spending a lot of time fulfilling patients' requirements (Kaewsriwong, 2006). The physical health problems that were found as a result of the caregiving role included fatigue,

migraines, tension headaches, back pain, decreased appetite and weight loss or increased appetite and increased weight gain, and/or hypertension (Evans, 2011; Kaewsriwong, 2006; Livingston et al., 2010).

Psychological aspect

The family caregivers may express psychological health problems because of the TBI persons' illness and needs. For example, the TBI persons that demonstrate high needs of care can cause the family caregivers to feel burdened, stressed, and suffer depression (Heinlen, 2006; Man, Lam, & Bard, 2003). Approximately 46% of caregivers reported distress more than non-caregivers (Gainer, 2015). Some of the family caregivers presented with personality changes due to caring and they have to take psychiatric medications while taking care of patients (Arango-Lasprilla et al., 2011; Evans, 2011; Livingston et al., 2010; Sung et al., 2013).

Socioeconomic aspect

The TBI family caregivers experienced disruption in employment, social isolation or decreased chances to participate in outside activities, social adjustment problems, and disruption in marital relationships (Kaewsriwong, 2006; Lehan, Stevens, Arango-Lasprilla, Sosa, & Jove, 2012). Approximately, 75% of TBI caregivers reported unemployment (Gainer, 2015). The problem of family caregivers working to earn money resulted from the difficulty in maintaining financial resources in the family which created financial burden during the long term care for TBI persons (Arango-Lasprilla et al., 2011). Moreover, around 90% of TBI caregivers showed that they were dissatisfied with their current social interaction (Gainer, 2015).

In summary, TBI impacts on the negative health of persons in regards to the physical, emotional, social, and behavioral aspects. To prevent or reduce negative complications and maintain health for the TBI person, the family caregivers have to adjust and adapt themselves to provide effective care. However, previous studies showed that TBI family caregivers had adverse health effects that possibly had an influence on their well-being while occupying a caregiver role in a long term phase.

Traumatic Brain Injury Care in Thailand

After TBI patients have recovered from the crisis stage of their injury and are in a stable condition, they will be discharged from hospital. The TBI patients and their family caregivers need to have preparations in place before the TBI patient returns home. Usually, a female family member such as a parent or wife is selected to take care of the ill member at home because the caregiver role is expected to be the natural responsibility of Thai women in the family (Meecharoan et al., 2013). The family caregivers are educated about caring for TBI patients from health professionals. The health care information that is included is; providing help for the patient's activities in daily living, observing and monitoring the patient's signs and symptoms, providing medications and rehabilitation for the patient to improve his/her health and to prevent complications (e.g., joint stiffness, muscle atrophy, pressure sores, and infection), and contacting and consulting a health professional in case of an emergency. Some family caregivers are trained in special procedures to support a

patient's needs, such as tracheotomy care and tube feeding (Khiewchaum, Ngamkhum, & Kittithonrakun, 2013). In addition, information regarding the post discharge follow up date is emphasized.

At home, the family caregivers fulfill the patient's daily activities, continue the caregiving process, as well as patient rehabilitation and take the TBI patient for follow ups with the neurosurgeon at the hospital as per appointment times. Usually, the TBI patients are taken to hospital for a follow up with the neurosurgeon on the second or third week post discharge. After that, they are taken for the next follow up every one to two months depending on the patient's condition. In cases of patients in a chronic and/or stable condition, however, they are taken for a follow up every three months or the family members came to meet the neurosurgeon instead to report on the patient's health condition and pick up any patient medication needed.

After discharge, the responsibility of visiting the TBI patients in the community is undertaken by community nurses who work at a primary care unit as part of the continuing care process under the service plan system. The activities of home visits focus on giving health education, rehabilitation and support. In some cases, the TBI patients are referred from the hospital to receive rehabilitation and/or medication at a community hospital near their house.

In summary, the TBI patients and their family caregivers prepare for the patients return to their home according to discharge planning or informal health care education. After TBI patients are discharged, they are taken care of by their family caregivers and other family members. Home health care from health care staff is provided in the early phase post discharge. In addition, they also receive medical

payments or financial support from the government and organizations while the patients continue to receive follow up care and some types of treatment.

The Family Resiliency Model of Family Stress, Adjustment, and Adaptation

The Family Resiliency Model of Family Stress, Adjustment and Adaptation was developed based on the work of Reubin Hill's ABCX model in 1949, the Double ABCX Model of McCubbin and Patterson in 1983, and the Typology Model of Family Adjustment and Adaptation of McCubbin and McCubbin in 1989 (Weber, 2011). According to this model, family resilience refers to "the positive behavioral patterns and functional competence individual and family unit demonstrate under stressful or adverse circumstance, which determine the family's ability to recover by maintaining its integrity as a unit while insuring, and where necessary restoring, the well-being of family members and family unit as a whole" (McCubbin & McCubbin, 2001, *p.* 5). In addition, the model consists of two phases namely; adjustment and adaptation which are explained in the following (McCubbin & McCubbin, 2001; VanBreda, 2001).

Adjustment Phase

Family adjustment is the outcome from the effort of the family when they try to deal with the specific and minor stress. There are six components in this phase (McCubbin & McCubbin, 2001; VanBreda, 2001).

1. The stressor (e.g., an acute illness in a family member). A stressor is a demand that occurs in the family and can make changes in the family system.

2. Family vulnerability. It is influenced by the pile-up of family stress, transitions, and strain that occur in the same period.

3. The family typology. It is the established pattern of functioning and refers to a basic attribute of the family system which can characterize and explain how the family system typically appraises, operates, and/or behaves.

4. The family's resistance resources. They refer to the abilities and capabilities of the family to solve and manage the stress for maintaining and promoting harmony and balance.

5. The family's appraisal of the stressor or situation. It refers to the family's perception or definition regarding the seriousness of the stressor and its related hardships.

6. The family's problem solving and coping strategies. The family tries to manage the stressors and hardships by identifying the stressor and situation as manageable, an alternative way of action, and initiating the step to solve any problems based on their abilities, skills, and strategies.

Adaptive Phase

The adaptation phase refers to the outcome from the family trying to deal with the stressors which can be prolonged, severe, and multiple and also the demand from the adaptation of itself. There are six components which interact together as explained below (McCubbin & McCubbin, 2001; VanBreda, 2001).

1. The pile-up of demands on or in the family. It may be produced by illness, family life-cycle change, and unsolved strains. Mostly, the family will

experience a pile-up of demands and the majority of these come from a chronic stressor in particular the family caregiver who is caring for a member with disabilities. There are nine principle sources of stressor pile-ups: (1) the stress and its hardships (resulting from initial stress and related hardship involving an additional stressor that comes from the initial stressor); (2) normative transitions (normative transition of individual family members and the family unit from the family life-cycle change); (3) prior strains (the previous stressor which is still unresolved and continues to influence the family, the new stressor can exacerbate it); (4) situational demands and contextual difficulties (e.g., lack of understanding or facilities for the family); (5) consequences of family efforts to cope (resulting from negative family behavior or strategies that are used to try to face the stressor); (6) intra-family and social ambiguity (some changes leading to ambiguity in a role or responsibility within the family or social context); (7) newly instituted patterns of functioning (the additional stressor that comes from new patterns of functioning); (8) Newly instituted patterns of functioning clash with family beliefs (conflicting between the new pattern of functioning and the family's values or beliefs or expectations); and (9) established patterns of functioning (resulting from the tension of conflict between the old and new pattern of functioning during establishment).

2. The family typology, determined by newly instituted or retained, established or restored patterns of family functioning.

3. Family's own internal resources and capabilities (e.g., hardiness, coalition, respect, and support). The family's own internal resources and family capabilities refer to the family's potential in meeting all demands when they are faced with the stressors, in particular to maintain or promote the harmony and balance as

well as the changes in a family established pattern of functioning. There are two sets of capacities which are: (1) the resources and strengths which that family has; and (2) coping behavior and strategies from both family members and the family unit. Family hardiness is included in this component and it is within the context of the family unit.

4. The family network of social support or social support. This refers to community-based resources, which include persons, groups, and institutions from outside the family that they can access and use to meet their demands. It also includes the services, such as medical and health care services, services from the other institutes which are the family's meso-environment such as school, churches, and employers. Moreover, the government policies and support for the family also account for community resources.

5. Family appraisal process. There are five levels in this process: (1) stressor appraisal is providing a definition and identifying the severity of a stressor; (2) situational appraisal is sharing the stressor, hardship and demands assessment; (3) family paradigm is the model of sharing beliefs and the expectations of the family unit to develop specific patterns of functioning; (4) family coherence is motivational and appraisal bases for transforming the family's potential resources into actual resources, facilitating changes, coping, and promoting the health and well-being of family members; and (5) family schema is the generalized structure of shared values, beliefs, goals, expectations, and priorities.

6. Family problem solving and coping ability. This refers to similar processes of problem solving and coping ability in the adjustment phase. It is the process of acquiring, allocating, and using resources to meet the demands from crisis situations.

The Outcomes from Adjustment and Adaptive Processes

Adjustment phase outcome

The adjustment phase is composed of three outcomes (McCubbin & McCubbin, 2001).

1. ***Bonadjustment.*** The family is able to adjust with life changes and presents as balance and harmony in family members' lives.

2. ***Maladjustment.*** The family is unable to cope with family system changes, in particular with a severe and chronic stressor that disrupts the balance and harmony.

3. ***Crisis stage.*** This is continuing on from maladjustment as stressors start to pile up and the family is ready to move to the adaptive phase.

Adaptive phase outcome

The adaptive phase is composed of two outcomes (McCubbin & McCubbin, 2001).

1. ***Bonadaptation.*** The family has succeeded with new coping which can bring back new balance and harmony to the family. There are four domains of life which stress acts on and it is indicative of the importance of balance and harmony. These four domains are: interpersonal relationships; structure and function; development, well-being, spirituality; and community relationships and nature.

2. ***Maladaptation.*** The family has failed to cope, and presents with disharmony and this impacts on a well-being outcome. As a result, the adaptive phase will start again (McCubbin & McCubbin, 2001).

According to the Family Resiliency Model, the adaptive phase is selected for this study since it is related to chronic stressors and the pile-up of demands in the family. In addition, the families are mostly faced with multiple stressors and many demands in this phase, which can affect family members' well-being. The family caregivers are assumed to be one of the family members and an important person; therefore, family caregivers surely have a significant change in their well-being as well. In the context of this current study, it was conducted on family caregivers of TBI persons after being discharged from hospital. There were many impacts on the family caregivers who were the major persons taking care of TBI persons. Taking care of TBI persons who have disabilities and require long-term rehabilitation will contribute to the pile-up of the stressors and demands which caregivers have to cope with and manage. Importantly, they have to face the stress of caregiving which can impact on their well-being which is the outcome of caregivers' bonadaptation according to this model. However, family hardiness and social support have been found to be the important factors in the adaptation phase. They were the resilience factors that act as the protective factors from the stressors and demands (McCubbin & McCubbin, 2001). The theoretical model has shown that the family's resources and social support promoted family well-being by buffering the impact of the pile-up of demands (e.g., using resources to resolve a problem), by influencing the definition of the situation such as positive appraisal, and maximizing the solutions available (VanBreda, 2001). Hence, the family caregivers could maintain or increase their well-being by these two factors.

This Family Resiliency Model was developed from the concept related to the family that focused on the family system or family as a whole (McCubbin &

McCubbin, 2001), however, the model was applied in the previous studies conducted in family caregivers and the components of this model were measured from several types of caregivers in Thailand and western countries such as the study on caregivers of Thai stroke survivors (Niyomthai et al., 2003), TBI patients (Larew, 2006), Autism Spectrum Disorder children (Weiss et al., 2013), and older disabled adults (Clark, 2002). Therefore, this model and some of its components were evaluated in Thai TBI family caregivers of this study.

Family Hardiness of TBI Family Caregivers

Definitions and Components of Family Hardiness

Based on the Family Resiliency Model of Family Stress, Adjustment, and Adaptation, family hardiness was included in the family's internal resistant resources of the adaptive phase. Family hardiness refers to the internal strengths and durability of the family unit which functions on buffering and mediating the effect of stressors or demands (McCubbin & McCubbin, 2001). Similarly, VanBreda (2001) mentioned that it could be representative of the regenerative family type in which the family members are active, try new ways to solve problems together, have their faith and are confident in their purpose as well as encouraging others to be active in addressing any problems.

Family hardiness consists of four important interrelated components (McCubbin & McCubbin, 2001; VanBreda, 2001). The first component is co-oriented commitment, in which the family works together to handle difficulties. In this

component, the family members are engaged in stressful situations and work together to solve the problems by changing the stressful situation to be events that are interesting and meaningful (Herron, 2009). The second component is confidence, in which the family has a sense of being able to handle problems and endure hardships. Furthermore, they view these problems as interesting and meaningful situations for them (Huang, 1996). Another component is challenge, in which the family has the ability to view hardships as challenges producing growth. In this third component, the family tries to learn from the experience of stressful situations, and they have the ability to view these situations as challenges and beneficial rather than a threat to their lives. The family is not afraid of any changes and views these changes as an opportunity for growth. However, in the family that sees the situations as a threat to themselves, there will be more experiences of stress and hardship in coping (Mark, 2008). The last component is control, in which the family has a sense of being in control of life rather than victims of circumstance or controlled by life situations. This control is the internal locus of control which allows one to believe that any stressful situations are influenced by his/herself. People with an internal locus of control would actively find out the best way to find solutions and use their effort to promote changes. However, people who have powerlessness in the control of their lives will be influenced from stressors and this indicates that they have an external locus of control more than an internal locus of control (Mark, 2008; McCubbin & McCubbin, 2001; VanBreda, 2001).

Assessment of Family Hardiness

The literature review showed the instruments that were commonly used to assess family hardiness including the Family Hardiness Index (FHI) and the Inventory for Family Protective Factors (Compensating Experiences subscale). The detail of these instruments is presented in the following:

1. Family Hardiness Index (FHI)

The FHI is a 20-item questionnaire developed by Marilyn McCubbin, Hamilton McCubbin, and Anne Thompson in 1986 (McCubbin et al., 2001). It is used to measure the family resistant resource within the family unit in terms of stress resistance and adaptation resources. It consists of four components which are: (1) control (3 items); (2) challenge (5 items); (3) co-oriented commitment (8 items); and (4) confidence (4 items). The respondents are asked to respond to the score in each statement with a 4-point Likert scale: 0 = false, 1 = mostly false, 2 = mostly true, 3 = true. There are nine items that have negative statements and reversed scoring (0 = true to 3 = false) including items number 1, 2, 3, 8, 10, 14, 16, 19, and 20. The score from all items are summed and the total score ranges from 0 to 60. A higher score is indicative of a positive perception of family hardiness.

After the FHI was developed, its validation was tested by the systematic examination of the association between hardiness and criterion indices of family strengths. The FHI positively correlated with the criterion indices (e.g., Family Flexibility, Family Time and Routines, Family Satisfaction) with validity coefficients ranging from .15 to .23. In addition, the internal consistency reliability was tested and found to have Cronbach's alpha coefficient of .82. (McCubbin et al., 2001).

The FHI has been used to assess family hardiness of several types of caregivers in many countries. For example, parents of children with developmental disabilities (Chen, 2004; Huang, 1996; VanSolkema, 1997), caregivers of older disabled adults (Clark, 2002), caregivers of elders with chronic illness (Franklin, 2003; Noreuil, 2002), parents of children with asthma (Svavarsdottir & Rayens, 2005), and caregivers of patients with depression (Richardson, 2000; Whitten, 2009). Among these studies, the construct validity and reliability have been documented. The construct validity was verified by factor loading and has shown the values ranging from .15 to .85 (Chen, 2004; Franklin, 2003). Moreover, the studies have tested the internal consistency of reliability and Cronbach's alpha values ranged from .69 to .91 (Augusto, Araujo, Rodrigues, & Mdo, 2014; Chen, 2004; Clark, 2002; Franklin, 2003; Richardson, 2000; Svavarsdottir & Rayens, 2005).

In Thailand, this instrument has been translated into the Thai version by Niyomthai et al. (2003) via the translation process and the content was also validated by three experts. After the translation and validation, the instrument was tested for reliability by examining the internal consistency with 120 caregivers of stroke survivors and it has shown good reliability with a Cronbach's alpha at .83. There are several studies in Thailand that have used the Thai FHI on caregivers; such as caregivers of cancer patients and caregivers of young people with mental illness. Among these studies, the content validity, reliability, and feasibility were established. One Thai study has shown the content validity index (CVI). The CVI scales value was at .94 and CVI items values ranged from .75 to 1.00 (Puasiri, Sitthimongkol, Tilokskulchai, Sangon, & Nityasuddhi, 2011). The internal consistency reliabilities

showed Cronbach's alpha coefficient ranged from .76 to .89 (Meecharoen et al., 2013; Tamtub, 2005; Pongsitthisak, 2003; Puasiri et al., 2011).

2. Inventory of Family Protective Factors (IFPF)

The IFPF is a 16-item questionnaire which was developed by five American researchers of Lehigh University, New Mexico State University, and the University of Wisconsin. It consists of four subscales. The first subscale is fewer stressors. This subscale consists of four items regarding the experiences of health, finances, family and friends, and work/school. The second subscale is an adaptive appraisal. It consists of four items related to a family's perception regarding self-esteem, optimism, creativity, and self-reliance. The next is the social support subscale. This subscale consists of four items regarding the support from at least one individual with a good relationship, one caring individual, one individual that the family can trust, and one person interested in the family. The last subscale is compensating experiences. It consists of four items regarding the family's experiences in levels of control over adverse circumstance and positive control in challenging situations. In addition, it is a 5-point Likert-type scale with 1 = almost always, 2 = generally, 3 = sometimes, 4 = a little, and 5 = not at all. The total score ranges from 15 to 75 for all subscales. For the compensating experiences subscale, it is usually used to measure family hardiness independently (Gardner, 2007).

The quality test of the instrument of the original IFPF explored the construct validity and internal consistency reliability. It showed the overall IFPF reliability with Cronbach's alpha at .81, and the Cronbach's alpha for the subscales of Fewer Stressors, Adaptive Personality, Supportive Environment, Compensating

Experiences were found at .53, .78, .81, and .68, respectively. Its construct validity was tested from correlation with four inventories. The results showed significant correlation between Fewer Stressors subscale and Family Inventory of Life Events ($r = .16, p < .05$), the Adaptive Personality subscale and the total FAM score ($r = .54, p < .01$), the Supportive Environment subscale and the Family Inventory of Resource Management scale ($r = .31, p < .01$), and the Compensating Experiences subscale and the total score of Family Hardiness Index ($r = .19, p < .05$) (Gardner, 2007).

The compensating experiences subscale was used to assess family hardiness of caregivers of children with autism spectrum disorder and families with disabled children (Augusto et al., 2014; Weiss et al., 2013). In these two studies, the content validity and reliability of this subscale have been established and the internal consistency reliability has shown Cronbach's alpha ranged from .87 to .93. The IFPF has not been translated into a Thai version to assess family hardiness.

From the above two measurements of family hardiness, there were some aspects assessing the sense of control over adverse life circumstance and sense of viewing the situation as a challenge. However, the FHI's components appropriately covered the concept of family hardiness of this model in this study. When considering the feasibility of use, the FHI was found to be used more in many studies in Thailand, particularly in measuring family hardiness in family caregivers of stroke survivors and cancer patients. Moreover, the FHI also had a high and acceptable Cronbach's alpha. Therefore, the FHI was selected to measure family hardiness in this study.

Existing Studies of Family Hardiness of TBI Family Caregivers

The existing studies regarding family hardiness in the TBI family caregivers are reviewed. Due to a lack of studies of family hardiness in TBI family caregivers, an extensive review of various types of family caregivers was done.

Family caregivers had a high level of family hardiness in several studies (Chen, 2004; Clark, 2002; Franklin, 2003; Meecharoen et al., 2013). Parents of adults/children with developmental disabilities had a high level of family hardiness (Chen, 2004; Clark, 2002). African American caregivers of chronically ill elderly persons reported that they had high levels of family hardiness (Franklin, 2003). Similarly, in Thailand, family hardiness was at a high level in family caregivers of young mentally ill persons (Puasiri et al., 2011). This result may be due to the family caregiver's level of tolerance and ability to cope with a patient's behavior and the receiving of help from others.

However, other studies showed that the family caregivers had moderate levels. For example, Whitten (2009) found that 60 parents of adolescents with depression had a moderate level of family hardiness. In Thailand, Niyomthai et al. (2003) conducted a study on family caregivers of stroke survivors and found that family hardiness was at a moderate level. In addition, the mean score of each component of family hardiness showed that the co-orient commitment had the highest score, while the lowest score was the control component. Tamtub (2005) studied 80 caregivers of patients with head and neck cancer while receiving radiotherapy. She found that the family hardiness of family caregivers was at a moderate level. Considering the score of each component of family hardiness, the highest score was

the commitment component, whereas the lowest score was the control component. The moderate level of family hardiness may be due to the influence from the perception of the severity of a patient's illness that makes the caregivers feel fear in an uncontrolled stressful situation (Tamtub, 2005).

In summary, family hardiness was studied in various types of family caregivers in western countries and Asia (e.g., Taiwan, Thailand). They cared for people with chronic illness, disabilities, mentally ill, cancer, and stroke. The findings showed that family hardiness was at a moderate to high level. The difference in the results may depend on several factors including the factors of the caregiver and patients which will be discussed in the next section.

Factors Associated With Family Hardiness of TBI Family Caregivers

This part is a literature review of the factors relating to family hardiness in TBI family caregivers. However, a limited number of studies have been conducted in this group of caregivers; therefore, the following factors were extended to a literature review of other types of caregivers. Previous studies showed that several factors related to family hardiness including the caregiver factors, patient factors, patient-caregiver relationship factor, and the family and community factor.

Caregiver factors

Educational level and economic status

Family hardiness may increase when family caregivers' education level and economic status are high. The family caregivers can gain experiences from education and increase their capacities to assess their life and caregiving situations, so

they may view these situations as challenges that can be controlled (VanSolkema, 1997). The previous study revealed that the mothers of children with intellectual disabilities who had higher education levels and economic status were greater in the mother sense of control and security in caring for their children (Ben-Zur, Duvdevany, & Lury, 2005). Furthermore, the educational factor was found in previous studies of spousal or partners of wives with chronic illness (Noreuil, 2002) and parents of children with developmental disabilities (Huang, 1996). The partners or spouses and parents who had higher educational levels reported higher family hardiness. They may have a chance to increase their knowledge related to illness, symptoms and management which can make them feel like the future is more predictable and controllable (Noreuil, 2002).

Belief and perception about illness

The belief and perception about illness of family caregivers may have an effect on family hardiness. For example, the family hardiness of Thai family caregivers may be at a low level due to a caregiver's special belief related to caring for sick family members. The caregivers of many Thai families believed in *Karma* or previous actions (Yiengprusawan et al., 2012). When something bad happens in the family including the sickness of a family member, the family may believe that it is a result from their previous bad actions or bad *Karma*. Most of the Thai family caregivers thought that their lives were controlled and fixed by sacredness (Tamtub, 2005). These beliefs may lead the family caregivers to feel like they are unable to control the sickness of family members and their life situations; which results in a negative influence on family hardiness (Yiengprusawan et al., 2012). Moreover, a

family caregiver's perception about a patient's illness that has been threatening their lives may negatively lead the family caregiver to feel an uncertainty in the relapse and fluctuation of the illness or signs and symptoms which is related to a low level of family hardiness in controlling situations (Tamtub, 2005).

Patient factors

Functional status

The study of Clark (2002) showed that there is a negative relationship between behavior and memory problems of a patient and family hardiness of caregivers ($r = -.38, p < .01$). The family caregivers who took care of patients with behavior and memory problems experienced lower family hardiness. When the family caregivers are unable to cope with behavior difficulties and memory problems of patients, they may revoke themselves from assisting patients and perceive a lack of family hardiness (Clark, 2002). Moreover, patients with a low functional status may lead family caregivers to feel more likely to have a sense of loss of control in taking care of patients (Puasiri et al., 2011).

Readmission

A study of spouses or partners of wives with chronic illness showed a negative relation between the number of times of patient readmission and family hardiness ($r = -.32, p < .05$) (Noreuil, 2002). It is indicated that a higher number of readmissions of patients was lower in the level of family hardiness. This may be due to the frequent experiences of readmission by family members which can lead to feelings of loss of control over a patient's illness and the feeling of inability to manage difficulties (Noreuil, 2002).

Patients-caregiver relationship factor

The relationship between family caregivers and patients may influence family hardiness. A close relationship found between family caregivers and patients including parents, spouses, children, and siblings enhanced the internal strength of families. Good and close relationships lead the family members to show their commitment in a caring role and their working together in difficult situations. They are willing to care for their loved one with a sense of attachment or bonding and obligation according to the roles of individual family members (Niyomthai et al., 2003; Samartkit et al., 2010; Tamtub, 2005). Those family members who took care of patients and helped each other in caregiving with a sense of love and the reward of affection presented a greater hardiness level in their families (Meecharoen et al., 2013; VanSolkema, 1997).

The family and community factor

The extended family which is composed of many family members living together within a type of rural community may have a positive influence on family hardiness (Tamtub, 2005). Caregivers who are living with a higher number of family members and are living in rural areas may lead to a higher perception of family members always helping each other. They have more available resources, such as, family members, relatives, and friends (Rattanasuk et al., 2013). The extended family members and relatives in a rural community may work better together with the family caregiver such as taking care of a child member when the family caregiver is busy, giving advice, financial support, and so on. Therefore, the family caregivers may

perceive higher family hardiness, especially higher for commitment, and controlling and managing situations (Tamtub, 2005).

Social Support of TBI Family Caregivers

Definition and Components of Social Support

In the adaptive phase of the Family Resiliency Model, social support was included in the family network of social support. McCubbin and co-worker (2001) have defined social support as community-based resources that come from external resources. These resources involve persons, groups, and institutions from outside the family as perceived by the family members that they could access and use to meet their demands. It also includes the services such as medical and health care services, services from other institutes which are the family's meso-environment such as schools, churches, and employers. Furthermore, the community resources include the government policies and support for the family (McCubbin et al., 2001; VanBreda, 2001). Social support has the ability to protect family members from the effects of stressors and promote family recovery from a family crisis. It seems to be that the family resilience factor can help family members to increase their adaptive power (McCubbin & McCubbin as cited in VanBreda, 2001).

Based on Cobb's conceptualization, McCubbin et al. (2001) has divided social support into three components which are: (1) emotional support; (2) esteem support; and (3) network support. The details of each component are explained in the following (Cobb, 1976; McCubbin et al., 2001):

1. Emotional support. This refers to the information exchanged at an interpersonal level which could lead an individual to believe that he/she is cared for and loved. In addition, it is the two way relationships in which the information will meet basic human needs according to Murray et al. (as cited in Cobb, 1976) including the succorance needs for one person (e.g., to have one's needs satisfied by someone/something such as love, nursing, help, forgiveness, and consolation), nurturance needs for others (e.g., to help the helpless, feeding them and keeping them away from danger), and affiliation needs for both (e.g., to be close and loyal to another person, pleasing them and winning their friendships and attention). This support mostly transfers from person to person when they are in intimate situations involving mutual trust (Murray et al. as cited in Cobb, 1976).

2. Esteem support. This refers to the information exchanged at an interpersonal level which could lead to an individual believing that he/she is esteemed and valued. This support leads him/her to increase his/her self-esteem and reaffirms his/her sense of self-worth. It can similarly be expressed as the need recognition of basic human needs according to Murray et al. (as cited in Cobb, 1976) which are related to gaining social status and displaying achievements. A person is valued and esteem is most effectively advertised in public places (Murray et al. as cited in Cobb, 1976).

3. Network support. This refers to the information exchanged at an interpersonal level which could lead an individual to believing that he/she belongs to a network of communication involving mutual obligation and mutual understanding. This support must be common in the sense that everyone in the network has the information and it is shared in the sense that each member is aware that every other

member knows. Furthermore, it must be the sense of one's place in a society, in that the membership is secured and maintained in a human group (Cobb, 1976).

Assessment of Social Support

According to the literature review, the measurements of social support included Social Support Index (SSI) and Interpersonal Support Evaluation List (ISEL).

1. Social Support Index (SSI)

The SSI was developed by Hamilton McCubbin, Joan Patterson, and Thommas Glynn in 1982. It consists of 17 items and was developed based on three dimensions of social support which are: (1) emotional support; (2) esteem support; and (3) network support. It has a 5-point Likert-type scale from 0 to 4 and the caregivers are asked to rate the agreement of the statement from 0 (strongly disagree) to 4 (strongly agree). Items' number 7, 9, 10, 13, 14, 15, and 17 are negative statements and they have reversed scoring (4 = strongly disagree to 0 = strongly agree). All of the scores are summed and the total score can range from 0 to 68. Higher scores indicate higher perceived levels of social support (McCubbin et al., 2001).

In addition, the qualities of the original SSI have been established from the developers. The validity was tested by the systematic examination of the association between the SSI and criterion index. It was found to have a .40 validity coefficient with the criterion of family well-being. The instrument was tested for

internal consistency and test-retest reliability, and was found to have a reliability of .82 and .83, respectively (McCubbin et al., 2001).

The SSI has been used in western studies to measure social support in parents of children with an autism spectrum disorder (Greeff & van der Walt, 2010; Plumb, 2011) and parents of adolescents with depression (Whitten, 2009). The construct validity was tested by the explored factor analysis of the SSI. It resulted in four factors: (1) community as a resource of support; (2) emotional, esteem, friendship and network support; (3) family-community connection; and (4) family affection and commitment. The SSI showed a coefficient of .45 (Sun & Stewart, 2007). Among these previous studies, the internal consistency reliability was found to have Cronbach's alpha values ranging from .69 to .91.

In Thailand, the SSI has been translated into the Thai version and modified by Rungreangkulkij (2000). This Thai version consists of 14 items and has a 4-point Likert scale (0 = strongly disagree to 3 = strongly agree). There were six items of the original SSI that have been deleted because they measured intrafamily support, and these are the original items numbered 2, 3, 7, 9, 12, and 17. An additional three items were added in order to make the SSI more relevant to Thai society. These three items are: "This community has social welfare or organizations to help the members", "My family and I get support from our neighbor", and "Health care providers visit my family and give suggestions for how my family can take care of the ill family member". This Thai version has three items that have reversed scoring because of negative statements, which are the item numbers 6, 8, and 9. The total score ranges from 0 to 42 and the higher scores indicate higher perceived social support. After the modification and translation of the instrument, it was used in a study of Thai

caregivers of persons with schizophrenia and its Cronbach's alpha was found to be .85 (Rungreangkulkij, 2000).

2. Interpersonal Support Evaluation List (ISEL)

The ISEL was developed by Cohen and Hoberman in 1983 and it has 40 items for the general population (Cohen & Hoberman as cited in Grant et al., 2006). It is used to measure the perception regarding available social support for a person. There are four subscales which are: (1) appraisal (information); (2) belonging; (3) self-esteem; and (4) tangible support. Half of the items have negative statements and reversed scoring, which are item numbers 3, 6, 9, 10, 11, 13, 14, 15, 17, 24, 25, 27, 28, 29, 30, 34, 35, 36, 39, and 40. The score is based on a 4-point Likert scale (0 = definitely false, 1 = probably false, 2 = probably true, 3 = definitely true). The total score ranges from 0 to 120. The higher scores indicate higher social support.

The quality tests of the original ISEL have been established. The validity of this instrument has been shown by testing its correlation with other measures. It was found to reversely correlate with psychological symptomatology ($r = -.52$ to $-.60$). The internal consistency reliability showed that Cronbach's alpha values ranged from .88 to .90 (Heitzmann & Kaplan, 1988).

The ISEL was used to measure social support in caregivers caring for people with chronic illness including the elderly with dementia (Kaufman, Kosberge, Leeper, & Tang, 2010), stroke patients (Grant et al., 2006), patients with coronary heart disease (Brummett, Morey, Boyle, & Mark, 2009), and patients with neuroendocrine tumors (Haugland, 2013). The internal consistency reliability has shown that Cronbach's alpha values ranged from .63 to .94. Among these studies, the

validity test has not been shown (Brummett et al., 2009; Grant et al., 2006; Haugland, 2013; Kaufman et al., 2010).

In Thailand, the ISEL was translated into the Thai version by Jantarapat (2015) via the back translation technique and decentering process. At the same time, this version was used in the study that was conducted on teachers residing in an area of unrest in southern Thailand (Jantarapat, 2015). Its validity and reliability have been reported. The face validity of the translated instrument was assessed by five teachers and it was shown that all of them agreed with the concept in the questionnaire and some words have been modified. The construct validity was tested by confirmatory factor analysis. The finding showed the model of social support has a standardized factor loading ranging from .14 to .64. The internal consistency reliability has shown a Cronbach's alpha value of .87 (Jantarapat, 2015).

From the above measurements of social support, the ISEL was unrelated to the main concept of social support in this study and it has a lot of items. The SSI was developed based on the concept of social support in the Family Resiliency Model that was used in this study and its reliabilities have an acceptable Cronbach's alpha. Therefore, the Thai version SSI was selected to measure social support in this study.

Existing Studies of Social Support of TBI Family Caregivers

This part presents the studies regarding social support of TBI family caregivers. However, studies on family caregivers of TBI persons are limited; therefore, the literature review was extended to the caregivers of patients with chronic diseases.

Kaewsriwong (2006) found that 46 Thai TBI caregivers had high social support levels. Each dimension of social support was also examined. The dimension of opportunity for nurturance is the highest mean score, while the lowest mean score is the domain sense of reliable alliance. This finding is similar to a study of 100 Thai stroke caregivers (Daonophakao, 2004). All the dimensions of social support consisting of the provision of attachment; person is valued; person is an integral part of social; the opportunity for nurturance; and the availability of information, emotional support, and material, were at high level. Furthermore, the caregivers reported the highest resources came from family members and relatives. Another study also indicated a high level of social support in 110 caregivers of patients with disabilities and dependency (Yamashita et al., 2013). The highest score of the social support dimensions was the affective dimension, followed by material, emotional support, information, and the lowest score was positive interaction.

Other studies showed that moderate levels of social support were reported by parents of adolescents with depression, caregivers of spinal cord injury patients, and caregivers of stroke patients. Whitten (2009) has explored social support of 60 parents of adolescents with depression. The result showed that parents perceived a moderate level of integration and reliance on the community. The community is an important source of emotional, esteem, and network support for parents while providing care their children. The study of Rattanasuk et al. (2013) which was conducted on 205 Thai caregivers of patients with a spinal cord injury has shown the similar result of a moderate level of social support. In this study, the family support was found to have the highest score, followed by health care providers support, relatives support, friends support, and the lowest score of support came from

providers in the community. Recently, another Thai study also found a moderate level of social support; it was conducted on 199 caregivers of stroke patients (Prombut et al., 2014). The majority of the caregivers reported a moderate level of support. The highest support came from family, followed by support from relatives or friends, and the lowest support was from health care providers.

On the other hand, a low level of social support was found in a study which was conducted on 103 Taiwanese caregivers of patients with stroke or Alzheimer's disease (Huang et al., 2009). The caregivers received limited social support from family and friends which may be due to the cultural expectation of Taiwanese families. In Taiwanese culture, families have certain members that are expected to be the primary caregiver also because the family size in Taiwan is currently declining this has resulted in not enough social support being received from other family members. In addition, the researchers found that the health care system in Taiwan did not have the support resources to meet caregiving needs (Huang et al., 2009).

In conclusion, social support level has been studied in various types of family caregivers in western and eastern countries which has shown an inconsistency in findings. The different results are possibly related to several factors (e.g. family size, health care system, sociocultural context) which will be discussed in the next section.

Factors Associated with Social Support of TBI Family Caregivers

The factors associated with social support of family caregivers were reviewed. They consist of caregiver factors, the patient's disability factor, and environment factors. The details of each factor are explained as follows:

Caregiver factors

Age

There was a significant positive correlation between family caregivers' ages and family caregivers' perceived social support from the family ($r = .45, p < .05$) (Raj, Shiri, & Jangam, 2016). In addition, the family caregivers who are at an adult age or an old aged adult usually are married and they have children to help them in caregiving tasks (Rattanasuk et al., 2013; Yamashita et al., 2013).

Marital status

The family caregivers who had a partner or a status of marriage experienced greater perception of social support. This is due to the family caregivers perceiving that they had someone to depend on when they need to relax, partake in fun activities, and be distracted from caring for patients. This is the emotional support for family caregivers (Yamashita et al., 2013).

Educational level

The educational level is important for the family caregivers in terms of getting and perceiving information of social support. Low educational backgrounds may be related to low perceptions of information on what kind of supports are available for the family caregivers and they may lack knowledge on how to access

those supports; for example, where they can get health care provider advice (Sit, Wong, Clinton, Li, & Fong, 2004).

Employment

Family caregivers who were employed while taking care of patients experienced greater social support. They perceived more support than unemployed family caregivers because they have financial support which is then easier to get other support resources, so this can affect perception regarding the level of social support (Cater, 2010).

Financial status

The family caregivers may have an average income lower than average national income statistics. However, they may perceive sufficiency of income in which they have the capacity to manage financially in caring and this did not impact on the perception of other supports; hence, they perceived greater social support (Kaewsriwong, 2006).

Number of caregiving hours

The family caregivers who have the responsibility of full time caring for patients without the possibility of assistance resulted in caregivers distancing themselves from affective and professional relationships. The impact of providing full time care diminished caregivers' social networks and any opportunities for socialization and leisure (Amendola et al., 2011).

Number of family members

The number of family members positively correlated with material support ($r = .25, p < .05$), emotional support ($r = .33, p < .05$), and affective support ($r = .24, p < .05$) (Yamashita et al., 2013). This indicated that larger numbers of family members resulted in greater in levels of social support. The family caregivers perceived greater social support due to having more persons that can help the caregiver feel comfortable to discuss anything, share feelings of over load, and can be depended on for some activities (Yamashita et al., 2013). This was found in particular for Thai families which mostly presented as the extended family type. They are living together in the same household or the community so they can support each other (Prombut et al., 2014). They may have many members to share the caregiving responsibilities and other work at home or outside (Cater, 2010). Moreover, having more family members may increase family caregivers' sources of financial support from the members who work (Yamashita et al., 2013).

Relationship among family caregivers, patients, and family members

The good, close relationships among family caregivers, patients, and other family members encourage bonding or attachment in the family. In addition, the family members may help each other according to their roles, responsibilities, and love in caring for patients. The family caregivers can get mainly support from other members. As a result, the family caregivers may perceive higher levels of social support (Charnsirimongkol, 2007; Kaewsriwong, 2006; Prombut et al., 2014).

Patient's disability factor

There was a significant negative correlation between patients' disabilities and family caregivers' perceived social support from others ($r = -.38, p < .05$) (Raj et al., 2016). This indicates that in caring for patients with a high level of disability, the family caregivers may have higher demands for social support from others, whereas their perception of social support available may be lower than their demands in caring for patients (Raj et al., 2016).

Environment factors

Accessibility of health care system

It was shown that less access to resources or available resources of social support can have an effect on the level of social support that family caregivers perceived. The study among primary caregivers of stroke patients and those with Alzheimer's disease in Taiwan showed both groups had low levels of social support. They explained that the Taiwanese health care system does not have the resources to meet the informal caregivers' demands (Huang et al., 2009). However, the result that was found in Thai family caregivers showed moderate accessibility of health care services due to these family caregivers and patients having more facilities such as holistic care programs and home visits (Rattanasuk et al., 2013).

Community type of family caregivers

In Thailand, the family caregivers who are living in rural communities may perceive greater levels of social support than those living in urban communities (Chaiyarit, 2012). People or neighbors in rural communities are usually relatives of family caregivers and on the whole they pay attention, help, and respect each other as

they do with their own family members. So, the family caregivers may feel that they have somebody they can depend on or help them in some situations (Rattanasuk et al., 2013).

Well-Being of TBI Family Caregivers

Definitions and Components of Well-Being

Well-being is an important health outcome of the human and there are definitions given for well-being from various sources. Well-being is referred to as the state of an individual that is not only an absence of an illness or pathology (Sustainable Development Research Network [SDRN], 2005) but it is the state of balance and harmony of one's personal life for the physical, psychological, and social conditions (Dodge, Daly, Huyton, Sanders, 2012; National Center for Chronic Disease Prevention and Health Promotion [NCDC], 2013). In addition, a similar definition is given by Huppert and Baylis (2004). Well-being at an individual level is referred to as the distinctively positive conditions of individuals' psychological, physical, and social states. These states could provide individuals with the way to go along and achieve prosperities (Huppert & Baylis, 2004).

Based on these review of well-being, well-being can be divided into two dimensions which are subjective and objective well-being (Diener, Scollon, & Lucas, 2003; Diener & Suh, 1997; SDRN, 2005). The two dimensions are explained as in the following:

Objective well-being

This refers to material well-being and quality of life (e.g., level and stability of income, the residential or living conditions, education, safety and security, work, number of friends, severity of disability (Alatartseva & Barysheva, 2015; Lu et al., 2015). Mostly, the objective well-being was measured as the physical and social well-being aspects (Carlozzi et al., 2015; Glajchen, 2012; NCDC, 2013).

The physical well-being of family caregivers is the physiological health or current impact from the caring processes for a family member on the physical abilities and physical health of the family caregivers (Harris, 2009). It could be explained more concrete in that it means physical functioning; fatigue; the quality of sleep; sexual functioning; any health problems; and self-behavior (e.g., dietary, exercise, recreational activity, rest, and sleep) (Carlozzi et al., 2015; Glajchen, 2012). Whereas, the social well-being is the basic needs of individuals to function in their normal living in communities. It is related to the social circumstances; for example, social connectedness, social or community relationships, social networks, and social equality (NCDC, 2013).

Subjective well-being

Subjective well-being is the opposite meaning of objective well-being. It has been defined as the individual experiences or values of life (Alatartseva & Barysheva, 2015); which are emphasized on the individual's own assessment of his/her own life condition regarding their lives in terms of how life is going, whether it is good or worse in regards to those living conditions. It is not the judgment of experts (Diener et al., 2003; Diener & Suh, 1997). Those individual life conditions

include life satisfaction, the presence of positive emotions and moods (e.g., joy, pleasure, happiness, harmony, love), and the absence of negative emotions and moods (e.g., depression, anxiety, anger, fear) as well as feelings regarding physical health (e.g., very healthy and full of energy) (Diener & Suh, 1997; NCDC, 2013). The other meanings of subjective well-being are such as respect, self-respect, confidence, realization in the purpose of life (Alatartseva & Barysheva, 2015). McCubbin et al. (2001) has defined well-being based on the subjective dimension as the overall general well-being of physical and emotional conditions and individual concerns.

According to this subjective well-being dimension, it can be measured as psychological and spiritual well-being aspects. Psychological well-being has been used in various terms such as emotional or mental well-being. The psychological well-being of caregivers could be impacted upon from the care process. In addition, the caregivers could express their feelings and experiences on the possible psychological outcomes.

Lowton (as cited in Harris, 2009) has stated the conceptualization for psychological well-being. It consists of four parts: (1) negative affectivity, which includes depression, anxiety, agitations, worry, pessimism, and distressing psychological symptoms; (2) happiness, which includes the cognitive judgment of positive affectivity over a long time interval; (3) positive affectivity which is an active pleasure or emotional state versus a cognitive judgment; and (4) psychological well-being, which is a balance between positive and negative affectivity (Harris, 2009, *p.* 53).

Additional to psychological well-being, the spiritual well-being aspect is related to the beliefs and religious beliefs of an individual (Amjad & Bokharey,

2014). It has been defined as “A state of being, reflecting positive feelings, behaviors, and cognitions of relationships with oneself, others, the transcendent and nature, that in turn provide the individual with a sense of identity, wholeness, satisfaction, joy, contentment, beauty, love, respect, positive attitudes, inner peace and harmony, and purpose and direction in life” (Gomez & Fisher as cited in Amjad & Bokharey, 2014, *p.* 23).

Nowadays, however, most researchers have paid more attention to subjective well-being which is focused on physical conditions appraisal as well as the emotional conditions (Harris, 2009; Kreutzer et al., 2009; Lu et al., 2015; Rattanasuk et al., 2013). The high attention on subjective well-being is due to the reason that the individual can assess his/her life conditions by his/her own values and experiences (Diener et al., 2003; Harris, 2009). Moreover, subjective well-being seemed to have a high impact from caring for chronically ill patients. Based on the National Alliance for Caregiving and the American Association of Retired Persons (2005), the finding of research on caregivers reported that caregivers experienced emotional stress more than physical strain.

To support the importance of subjective well-being, the previous research studies of caregivers' well-being that was conducted in caregivers of stroke survivors (Niyomthai et al., 2003), TBI and spinal cord injury patients (Kreutzer et al., 2009; Rattanasuk et al., 2013), and autistic children (Lu et al., 2015) have also defined caregivers' well-being based on the subjective dimension. The caregivers' well-being is an individual perception or evaluation of their life experiences and emotional conditions in both positive and negative emotions during the caregiving process such as life satisfaction, distress, anxiety, happiness, and so on (Kreutzer et al., 2009; Lu et

al., 2015). Caregivers' well-being is also included as physical appraisal such as energy or vitality (Rattanasuk et al., 2013). This subjective well-being dimension is, therefore, of interest to examine in TBI family caregivers in this study.

In brief, the current study of Thai family caregivers of TBI persons has evaluated subjective well-being. This is due to the evidence which supports the importance of the subjective dimension that has been mostly assessed from previous studies of caregivers' well-being, and due to individuals using their own experiences to evaluate their conditions. In addition, the subjective dimension has consistency with the purpose of evaluating well-being based on the Family Resiliency Model; which focuses on overall general well-being of physical and emotional conditions. In the current study, therefore, well-being was assumed as subjective well-being and was defined as the individual evaluation of one's life conditions including the emotional and physical conditions during caregiving experiences. In particular, the positive and negative affective emotions ranged from depression to joy and caregivers' concerns about their physical well-being (health, energy, or vitality). Caregivers' well-being can be presented as either positive or negative experiences.

Assessment of Family Caregiver's Well-Being

The measurements of subjective well-being that have been reviewed from various studies of caregivers consisted of (1) World Health Organization-Five Well-Being Index (WHO-5), (2) Family Member Well-Being Index (FMWB), and (3) Mental Health Dimension of Medical Outcomes Study 36 Items Short Form Health Survey (SF-36). The details of each measurement are presented below:

1. World Health Organization-Five Well-Being Index (WHO-5)

The WHO-5 is a 5-items questionnaire that was developed by the World Health Organization Collaborating Center for Mental Health, Frederiksborg General Hospital in 1998. It is used to measure three aspects of well-being which are: (1) a positive mood; (2) vitality; and (3) general interests that can be assessed in the past two weeks. It consists of 5 items measured by a 6-point Likert scale. Each item is rated on a scale of 0 (not present) to 5 (constantly present). The total score can range from 0 (absence of well-being) to 25 (maximum well-being) and higher scores indicate greater well-being (WHO as cited in Rattanasuk et al., 2013).

The quality tests of this original WHO-5 have been established. The internal validity found the Loevinger coefficients were all above .40 which indicated the number of the items measured under the same concept. The external validity was tested by examining receiver operating characteristic analyses and was shown to have good external validity (Bonsignore, Barkow, Jessen, & Heun, 2001). In addition, the internal consistency and test-retest reliability showed Cronbach's alpha at .87 and .90, respectively (Wu, 2014).

The original WHO-5 was translated into many languages for other countries. A number of studies have used WHO-5 for measuring well-being and screening depression in the general population and patients (e.g., chronic illness, and pregnant women). Among these studies, the construct validity was tested by exploratory factor analysis and found all items had a factor loading greater than .74. In addition, content validity showed the content validity index (CVI) was an average of .76 to .80. The internal consistency reliability showed Cronbach's alpha ranged from .83 to .89 (Mortazavi, Chaman, & Khosravi, 2015; Wu, 2014).

In Thailand, WHO-5 was translated into the Thai version via the back translation process by Saipanish, Lotrakul, and Sumrithe (2009). The instrument was found to have moderate convergent validity with the Hamilton Rating Scale for Depression. The internal consistency reliability was reported as Cronbach's alpha of .87. Previously, Thai WHO-5 was used to measure well-being in the study of caregivers of spinal cord injury patients. The internal consistency reliability was reported as a Cronbach's alpha of .86 (Rattanasuk et al., 2013).

2. Family Member Well-Being Index (FMWB)

The FMWB was developed by Hamilton McCubbin and Joan Patterson in 1982 (McCubbin et al., 2001) and based on the general concept of well-being regarding the overall well-being, physical and emotional well-being concerning an individual. It is used to measure the family member's concern about general health, tension, energy, cheerfulness, fear, anger, sadness, and the member's health concerns. In addition, it consists of 8 items and is measured on a 10-point numeric rating scale which ranges from 0 to 10, with a scale of 0 meaning not at all and a scale of 10 meaning very much. There are six items that have negative statements with reversed scoring (0 = very much to 10 = not at all) and these items are numbers 1, 2, 5, 6, 7, and 8. The total score can range from 0 to 80 and higher scores indicate higher family member well-being.

The quality tests of this original FMWB for both validity and reliability have been established. This instrument has been validated through various studies such as farm families, military families, rural bank family employees, and investment executive families. The concurrent validity showed the FMWB had a

moderate to strong positive association with other criterion indices of family coherence and meaning, social support, and family system resources, and a negative association with emotional distress of a spouse. Moreover, the internal consistency reliability was found to have good reliable with a Cronbach's alpha at .85 (McCubbin et al., 2001).

Studies in other countries have used FMWB to measure well-being in TBI caregivers (Larew, 2006), parents of children in oncology (Kelly et al., 2014), and family members of patients after a critical injury (Leske & Jiricka, 1998). Among these studies, the instrument validity has not been reported but the internal consistency reliability showed that Cronbach's alpha ranged from .69 to .85 (Kelly et al., 2014; Larew, 2006; Leske & Jiricka, 1998).

The FMWB was translated into Thai language via the back translation process by Niyomthai et al. (2003). After translation, the content validity of the Thai FMWB was also ensured by three experts and a pilot study was done for internal consistency reliability in 10 family caregivers of stroke survivors. The reliability from the pilot test has shown a Cronbach's alpha of .77. The previous Thai studies that have used the Thai FMWB to measure well-being in caregivers are studies in caregivers of stroke survivors (Niyomthai et al., 2003), parents of chronically ill children (Sangsuwan, 2006; Vipamaneeroj, 2002), and parents of hospitalized newborn babies (Wonginchan, 2003). The qualities of the instrument have been explored. The content validity and appropriateness of language used were examined by three to five experts and the results were ensured. The internal consistency reliability was reported as Cronbach's alpha values ranging from .69 to .78.

3. Mental Health Dimension of 36 Items Short Form Health

Survey (SF-36)

The Short-Form Health Survey (SF-36) is a 36 items questionnaire which was developed in Medical Outcome Study by RAND Corporation. It is composed of eight scales which are: (1) physical functioning; (2) role limitation (due to health problems); (3) social functioning; (4) bodily pain; (5) general mental health; (6) role limitation (due to emotional problems); (7) vitality (energy and fatigue); and (8) general health perception (Bertella et al., 2007). Among these scales, there were physical and mental health dimensions. The mental health dimension (vitality, social functioning, role emotion, and mental health) was used to measure well-being. This dimension consists of 14 items. The standardized score can range from 0 (worst health) to 100 (best health) for each scale. Higher scores in the dimension indicate a sense of peacefulness and happiness (Sarkin et al., 2013).

The quality tests of this original SF-36 have been established. The concurrent validity has shown the mental health component of SF-36 has strongly correlated with the quality of well-being self-administered scale (Sarkin et al., 2013). The internal consistency reliability has shown Cronbach's alpha ranging from .67 to .95 for eight scales and the physical and mental dimensions were shown to have Cronbach's alpha at .94 and .89, respectively. In addition, the test-retest reliability coefficients ranged from .75 to .80 (Ware, Snow, Kosinski, & Gandek as cited in Grant et al., 2006).

The SF-36 have been used in many countries to measure well-being, health, and quality of life in the studies which were conducted on caregivers of children with cerebral palsy (Raina et al., 2005), caregivers of stroke survivors (Grant

et al., 2006), and caregivers of Alzheimer patients (Machnicki et al., 2009). Among these studies, the qualities of the instrument have been explored. The SF-36 has shown concurrent and discriminative validity in that there was a significant negative correlation between SF-36 and the Zarit Burden Interview Scale. The internal consistency reliability for the eight scales showed Cronbach's alpha values ranging from .72 to .92 (Grant et al., 2006; Machnicki et al., 2009; Raina et al., 2005).

The SF-36 was retranslated into a Thai version by Leurmarnkul and Meetam (2005) via a forward-backward technique. The construct validity was tested and it showed significant correlation coefficients among the scales and the dimensions that were greater than .40. The internal consistency reliability showed Cronbach's alpha ranging from .72 to .80 for all the dimensions. The previous Thai studies that have used the Thai version to measure health and quality of life were those undertaken in patients with spinal cord injuries, caregivers of disabled people with spinal cord injury, multiple sclerosis patients, low back pain patients, and heart failure patients. In one study, the construct validity was ensured by a correlation between SF-36 and New York Heart Association Functional Classification (Paneewat, 2008). Among these studies, the internal consistency reliability showed Cronbach's alpha ranging from .67 to .95 for all the scales. Moreover, the test-retest reliability showed the Pearson correlation ranging from .84 to .94 (Laosanguanek, Wiroteurairuang, Siritho, & Prayoonwiwat, 2011; Paneewat, 2008; Trevittaya & Wattanavittawat, 2016; Wongsa, Tongprasert, & Kovindha, 2011).

In summary, there were three instruments that have assessed well-being in various populations. The SF-36 was found to be more reliable with the Cronbach's alpha coefficient ranging from .67 to .95. The overall components of the

SF-36 covered the definition of well-being; however, it has usually been used to measure general health, health status, and quality of life. The WHO-5 was commonly used to assess and screen depression in the general population and patients. According to the dimensions of well-being, FMWB was found to be more appropriate to measure subjective well-being based on the components of the instrument. Also, the FMWB was more consistent with the operational definition of well-being in caregivers that is used in this study. The reliability of FMWB was high enough to use (Cronbach's alpha coefficient of .69 to .78). Therefore, the FMWB was selected to measure caregivers' well-being in this study.

Existing Studies of Well-Being of TBI Family Caregivers

Since caring for TBI persons can impact on family caregivers' well-being, it is important to examine the well-being level which was the health outcome among caregivers. However, there were limited studies on these caregivers; the literature review was extended to other groups of caregivers.

Three studies showed a low level of well-being among TBI caregivers. Kreutzer et al. (2009) explored well-being in terms of emotional distress and life satisfaction of 275 caregivers of TBI patients at one, two, and five year post injury. The results showed high levels of emotional distress and quite low levels of satisfaction with life that remained at different times after a patient's injury. Similarly, a study of Livingston et al. (2010) showed that 336 TBI caregivers had well-being at a low level over time at one and two years after discharge. The low level of well-being also was found in the study of 60 caregivers of injured person which involved TBI persons (McAllister et al., 2012). For the dimensions of personal well-being, the

lowest mean scores were the domains of satisfaction health and feeling part of their community, the highest scores were in the dimension of satisfaction with safety and personal relationships (McAllister et al., 2012). These caregivers reported that low well-being may be because they have been taking care of patients with high functional disabilities and neurobehavioral problems (Livingston et al., 2010; McAllister et al., 2012).

Other studies showed a moderate level of caregivers' well-being. A study of Daonophakao (2004) explored the psychological well-being of 100 Thai stroke caregivers that was similar to the study of Jaroonsit (2011). The overall mean of the total score of well-being showed a moderate level. In addition, low scores of well-being were items related to anxiousness; feeling depressed; general feelings; satisfied with personal life; behavioral and emotional control; emotionally stable and sure of self; and tired. The finding in the study of Rattanasuk et al. (2013) showed that the well-being of Thai caregivers of patients with spinal cord injuries was at a moderate level.

Two studies showed that family caregivers had high levels of well-being. Niyomthai et al. (2003) examined the subjective well-being of 120 stroke caregivers. The result showed that overall well-being was at a quite high level. Another study by Charnsri (2008) showed the similar result in which high levels of well-being were reported from 115 families of stroke patients. This high level may result from close relationships between the caregivers and patients and the long term care that allowed the families to adapt and cope with any caregiving problems.

In summary, the well-being of many types of family caregivers has been studied in many countries. The results of these studies were varied. The different

results may be due to the patient factor, caregiver factor, and environment factor which will be explained in detail in the next part.

Factors Associated with TBI Family Caregivers' Well-Being

Factors associated with family caregivers' well-being have been reviewed from several studies of family caregivers of patients with chronic illness. The factors are categorized into caregiver factors, patient factors, and environment factors as outlined in the following:

Caregiver factors

Age

The family caregivers who were at an older age of around 40 to 60 years have been shown to have higher levels of well-being (Meecharoen et al., 2013). At this older age, they may view life changes as positive (Rose, 2012) and they may have more experience in caregiving in stressful situations as well as more experience in solving problems that may arise in these situations. Therefore, older caregivers may adapt more easily thus resulting in less impact on their well-being (Meecharoen et al., 2013; Rose, 2012). However, the family caregivers who were in the young adult age group reported lower well-being levels. At this age, they are starting to work and gain success but they have to take responsibility of care in which some of the patients have low functionality and dependency levels. When young adult caregivers have to spend a lot of time in caring and also work, they may experience fatigue, feel exhausted, and stressed resulting in a negative impact on well-being (Jaroonsit, 2011).

Gender

Female caregivers have presented with more impact on their well-being than male caregivers and they are also more likely to be depressed and anxious than males (Kassaye, 2012; McAllister et al., 2012). This is due to women being expected to take responsibility and provide care including activities of daily living and instrumental activities of daily living when the family members get sick. It is the cultural expectation that in particular is found in Thai families (Meecharoan et al., 2013) and this increases the emotional distress of women. For example, the study regarding caregivers of Alzheimer patients revealed that female caregivers have more burden than male caregivers (Akpinar, Kucukguclu, & Yener, 2011; Kassaye, 2012). As a result, female caregivers reported lower well-being than males (McAllister et al., 2012).

Marital status

The study in TBI family caregivers has shown that marital status, such as having a partner or being married, contributed to higher caregivers' well-being and that such caregivers presented with more positive life changes in the long-term than the other statuses such as single, divorced, and being widowed (Berg, Fiebig, & Hall, 2014). This may be due to the relationship, feeling loved from someone as well as having support (e.g., advice, material, financial support) from their partner and children which helped the family caregivers to respond positively to life changes and present with positive well-being (Boonyawat & Sunsern, 2005; Meesuk, 2005; Rose, 2012).

Education level

A lower level of education was associated with poorer well-being in terms of poorer mental health (Butterworth et al., 2010). Similarly, in the study of caregivers of dementia patients, it was found that lower education levels in caregivers were associated with higher burden and this had a negative impact on caregivers' well-being (Kassaye, 2012; Savundranayagam, Montgomery, & Kosloski, 2007). This is due to family caregivers with a higher education level can gain more knowledge that they can use to find out about available support and facilities. In addition, knowledge can contribute to caregiving skills and positive attitudes in caring. They have more ability to manage patients and themselves which resulted in gaining more well-being (Boonyawat & Sunsern, 2005).

Employment status

The family caregivers who were also working were shown to have a greater level of well-being than those who were not employed (Saunders, 2010). This was due to working as being time away from the caregiving role as well as being a source of financial or social support (Coughlin, 2010). In addition, both employment status and the caregiving role may promote growth and development in a caregiver's life as well. However, the family caregivers who were not employed have reported lower income levels and more have presented with depression (Coughlin, 2010; Mbugua, Kuria, & Ndeti, 2011; Saunders, 2010).

Income

Low income levels have impacted on family caregivers' well-being because income is a basic need for caregivers when caring for patients. If they

perceived income insufficiency, they may have problems in regards to medical payments, transportation, and other materials. Low income levels increased financial stress and contributed to depression more than caregivers who have higher income levels (Butterworth et al., 2010; Kassaye, 2012). On the other hand, caregivers with higher income levels were less stressed and had higher levels of well-being ($r = .20$, $p < .05$) (Charnsri, 2008; Jaroonsit, 2011). In addition, the TBI caregivers have also reported better physical and overall health if they have a higher income (Rose, 2012).

Health status

The well-being of family caregivers was negatively affected by their poor perception of health (Kassaye, 2012) and this could lead to depression and anxiety (Mahoney, Regan, Katona, & Livingston, 2005). Moreover, the caregivers who perceived poorer health were reported with poorer well-being than the persons who perceived better health when caring for patients (McAllister et al., 2012).

Relationships between caregivers and patients

The study showed that the impact of a poor relationship and conflict between the family caregiver and the care recipient led to negative effects on the caregiver's psychological well-being (Kassaye, 2012). In addition, a poor relationship may be a result of the aggressive behavior of the patient (Butterworth et al., 2010; Kassaye, 2012). On contrary, good and close relationships in particular between parents, spouses and children caregivers and their beloved patients will enhance caregivers' well-being. This may be due to having a sense of love, affective relations, bonding, commitment with the roles, good will and wishing patients to recover; which

is a positive feeling that can motivate family caregivers to take care of patients (Charnsri, 2008; Niyomthai et al., 2003; Rattanasuk et al., 2013).

Caregiving duration

Caring for patients over a long duration may contribute to the decreasing well-being of caregivers. The study has revealed that the caregiving duration was negatively associated with caregivers' well-being ($r = -.26, p < .05$) which may be due to feelings of tiredness, being disheartened, having chronic depression, boredom, as well as having health problems (Daonophakao, 2004). In contrast, the benefit of long-term care is that caregivers can gain more experience in caring, the ability to solve problems, understanding and adapting to patients' conditions, as well as the ability to integrate caring activities into their daily lives (Charnsri, 2008; Ishikawa, Suzuki, Okumiya, & Shimizu, 2011).

Number of hours spent in caring

Long hours of caregiving per day were associated with poorer well-being of the caregivers. This may be due to family caregivers having to take on both the responsibilities of housework and of patient care. The overload of work can create feelings of tiredness and stress. In addition, caregivers have less time to rest or relax (Daonophakao, 2004). Some studies showed that the long hours of caring (> 20 hours/week) may create burden, stress, and some health strain. Therefore, it can have a negative influence on family caregivers' well-being (Bastawrous, Gignac, Kapral, & Cameron, 2015; Berg et al., 2014).

Patient factors

Gender

The study on caregivers of Alzheimer patients showed that caregivers experienced more frequent episodes of anxiety which may have a negative influence on well-being especially when caring for male patients (Mahoney et al., 2005). In addition, caregivers of male injured persons have shown low levels of well-being in the long-term as well (McAllister et al., 2012). However, there was limited description of this finding, which may be due to the majority of caregivers being women providing care for male patients and thus female caregivers reported greater impacts from caring for patients than male caregivers (Mahoney et al., 2005).

Vocational status

The vocational status of patients was associated with family caregivers' well-being. The study on TBI family caregivers has shown that TBI persons who were employed or in unpaid vocational work resulted in better family caregivers' well-being than caregivers who were caring for unemployed persons (Kreutzer et al., 2009).

Functionality

Family caregivers who have taken care of patients with lower functionality were found to have lower levels of well-being. This is due to patients with functional impairment creating an increased burden on family caregivers. They have to assist the patients in the activities of daily living to fulfill all needs which takes up more time per day and this contributes to caregivers' stress (Jaroonsit, 2011; Rattanasuk et al., 2013). The previous studies have also shown that patients with some

disabilities could psychologically impact on family caregivers resulting in conditions such as high stress, depression, and anxiety (Ferrara et al., 2008; Kassaye, 2012; Kreutzer et al., 2009; Rose, 2012). Moreover, caring for TBI patients who have sustained severe injuries commonly present with functional disabilities that may disrupt the caregivers' well-being more than caring for patients with a lower injury severity and higher functional levels (Livingston et al., 2010; McAllister et al., 2012). On the contrary, caring for patients with higher functional ability resulted in higher caregivers' well-being ($r = .33, p < .01$) (Jaroonsit, 2011).

Severity of patients' disease

The study has found that there is a negative correlation between severity of disease and caregivers' well-being ($r = -.16, p < .05$) which indicated higher severity will result in lower well-being. This is due to the high illness severity which was perceived as threatening to patients' lives. The family caregivers may feel stress, fear, and anxiety about a patient's recovery. This can be a negative impact on family caregivers' well-being (Boonyawat & Sunsern, 2005).

Other illness and complications of patients

Caring for patients with other illnesses and complications can create feelings of concern and stress in family caregivers in regards to the unstable condition of a patient. This situation may increase levels of anxiety in caregivers regarding the way to manage adverse conditions. This will have a negative impact on family caregivers' well-being (Daonophakao, 2004).

Number of patients' hospital admissions

The study has shown caregivers of patients with a higher number of hospital admissions resulted in lower caregivers' well-being ($r = -.13, p < .05$). This may be due to patients who are readmitted many times to hospital having an increased severity of illness. It can contribute to caregivers' stress and anxiety in which the caregivers may perceive the illness as a worse condition and the result is decreased caregiver well-being (Boonyawat & Sunsern, 2005).

Environment factors

Number of family members in same households

The study in caregivers of schizophrenia patients found higher burden in the caregivers who had fewer numbers of family members in one household (Adeosun, 2013). This may be due to the higher load of responsibility of the caregivers' tasks or other work in the family home because of less family members to share the load. Therefore, this also may lead to lower levels of well-being among this group of caregivers (Adeosun, 2013).

Cultural and religious effect

The well-being of family caregivers may be influenced from their culture and/or religion. For example, in Thai culture, children caregivers take care of their parents with good gratitude (Charnsri, 2008). They believe that caring for their parents is a chance to pay back good things. Also, spouses are expected to take responsibility and care for each other after marriage, so caregivers will perceive that caring is not burden (Jaroonsit, 2011). Moreover, Buddhist people also believe in making merit and *Karma* (previous actions) in which taking care of patients is gaining

merit for future good returns. From these examples, Thai culture may have a positive impact on caregiver well-being (Jaroonsit, 2011; Niyomthai et al., 2003; Rattanasuk et al., 2013).

The Relationships Between Family Hardiness, Social Support, and Well-Being of TBI Family Caregivers

This part presents the relationship between the main variables of the current study consisting of family hardiness, social support, and caregivers' well-being. Due to there being limited studies that have examined these relationships among TBI family caregivers, the literature review on this part is extended to family caregivers providing care for a family member with a chronic illness.

Family Hardiness and Well-Being of TBI Family Caregivers

Family hardiness is an important internal resource for the family caregiver to cope with stressful situations. Various studies have examined the relationship between family hardiness and family caregivers' well-being as outlined in the following.

One study was conducted in Thai stroke survivor caregivers and the relationship was examined based on the Family Resiliency Model. The family caregivers in this study consisted of 120 persons who provided the majority of care for the stroke survivor over one month at home. The result revealed family caregivers' well-being positively correlated with family hardiness ($r = .44, p < .01$) (Niyomthai et

al., 2003). The other study was in a group of caregivers of children with chronic illness. In the study of 137 parents of young children with asthma, the Family Resiliency Model of family stress, adjustment and adaptation was employed to find the relationship between family hardiness and parents' well-being. The result showed that there was a direct effect of family hardiness on parental well-being ($\beta = .47$, $p < .001$). The family hardiness was the resilient factor within the family unit that helped parents to adapt to a stressful life event (child's chronic illness) and contributed to the parents' well-being (Svavarsdottir et al., 2000). In a similar group of parents of children with asthma, 73 African American and Caucasian parents were explored in regards to the influence of family internal strength and resources on their well-being. It was found family strength had a significant positive correlation with parental general well-being ($r = .62$, $p < .01$). The study has suggested that the family strength is an important resiliency factor for promoting well-being (Lee, Jackson, Parker, DuBose, & Botchway, 2009).

In addition, the resilience characteristics of families with caregivers of children with diabetes mellitus type 2 were conducted to find the relationship between the resilience factor (family hardiness) and family adaptation (balance and harmony represent well-being). The result revealed a significant positive relationship between these two variables ($r = .54$, $p < .01$). This context showed the important role of family hardiness for buffering the stressors of life events and the hardiness of the family helped the caregivers or family members to adapt easily to the crisis situation (Koegelenberg, 2013). Furthermore, the relationship was explored in a similar group of caregivers of 100 mothers of adult children with intellectual disabilities. There was a significant positive correlation between hardiness and mental health (e.g., life

satisfaction, depression and distress, feeling happy, and moody) of mothers ($r = .72$, $p < .001$). The result indicated that hardiness can help mothers to control and cope with situations, as well as in the engagement to their role and caregiving tasks (Ben-Zur et al., 2005).

Social Support and Well-Being of TBI Family Caregivers

Social support is a helpful resource that can buffer caregiving problems and stressful situations for caregivers (VanBreda, 2001). There were several studies that have been conducted to examine the relationship between social support and caregivers' well-being (Boonyawat & Sunsern, 2005; Daonophakao, 2004; Ergh, Hanks, Rapport, & Coleman, 2003; Jaroonsit, 2011; Lu et al., 2015; Werner & Shulman, 2013).

The previous study of Ergh et al. (2003) was conducted in 60 pairs of TBI caregivers and patients. The results revealed significant positive correlations between social support and subjective well-being (life satisfaction) in TBI caregivers ($r = .39$, $p < .001$). Jaroonsit (2011) has found a positive relationship between social support and psychological well-being ($r = .22$, $p < .01$) in 100 Thai primary caregivers of stroke patients. Social support from health care services such as health care information, rehabilitation programs, patient visits, and emotional support can help caregivers to increase their ability to take care of patients and reduce caregivers' tension. As a result, increased social support could increase caregivers' well-being (Jaroonsit, 2011). In addition, Daonophakao (2004) found that a study in 100 Thai stroke caregivers revealed a significantly positive relationship of social support and psychological well-being ($r = .43$, $p < .05$). The researcher mentioned that social

support could help persons to release feelings of stress, due to providing helpful resource options for caregivers to cope and rely on (Daonophakao, 2004). Moreover, another study was conducted among 205 Thai caregivers of spinal cord injury patients which showed a significant positive direct effect of social support on caregivers' well-being ($r = .06, p < .001$).

Furthermore, there were the studies conducted among caregivers of children which found the same significant relationship. One study was conducted in 118 Chinese parents of children with Autism Spectrum Disorders (ASD) (Lu et al., 2015) which showed that social support had a significant positive correlation with parents' subjective well-being ($r = .57, p < .01$). In 170 Thai families of children with thalassemia, social support was found to have a significant positive correlation with caregivers' well-being also ($r = .48, p < .05$). The study has shown support from family members, relatives, and siblings can lead to lower caregivers' stress and increased levels of caregivers' well-being (Boonyawat & Sunsern, 2005).

In summary, family hardiness and social support have found to be important factors for caregivers in particular to release caregivers' stress and increase well-being. The evidence has shown the significance positive relationship with family hardiness and caregivers' well-being and a positive relationship with social support and caregivers' well-being in several types of family caregivers. However, these relationships have limited studies in TBI caregivers.

Summary of Literature Review

Traumatic brain injury causes an alteration in the brain of individuals and this alteration can lead to life changes in the short and long-term. Deterioration varies depending on the TBI severity level. Greater severity can cause more health problems in some patients and some may have disabilities that require short or long-term recovery. To maintain health and prevent any complications of the person in particular, those with moderate and severe TBI, continuing care from the family is necessary.

The family caregiver is the key person in the family that has to take care of and fulfill the TBI person's needs. Providing care for TBI persons who have disabilities, impairment and require long-term rehabilitation will lead to increased stressors and demands. This stressful situation of caregiving can impact on the caregiver's well-being which is the outcome of caregiver's bonadaptation according to the Family Resiliency Model. Family hardiness and social support are important factors in the adaptation phase that act as protective factors from the stressors and demands (McCubbin & McCubbin, 2001).

Previous literature in western and eastern countries (e.g., Taiwan, Thailand) showed contradictions in the findings. Family caregivers of persons with chronic illness had various levels of family hardiness, social support, and well-being. However, many studies showed that family hardiness and social support positively correlated with family well-being. Thus, the family caregiver could maintain or increase their well-being by these internal and external factors.

However, studies regarding the internal and external resources (i.e., family hardiness, social support) and adaptation outcome (well-being) of caregivers who provide care for TBI persons at home were limited in Thailand. Although patients post hospital discharge were not in the crisis illness stage, the chronic illness and complications post TBI and the pile up of the stressors and all the demands of caregiving in the long term stage may affect the well-being of family caregivers (McCubbin & McCubbin, 2001). Therefore, family hardiness, social support, well-being and the relationships well-being of TBI caregivers were examined in this current study based on the Family Resiliency Model of Family Stress, Adjustment, and Adaptation.

Chapter 3

Research Methods

This chapter covers all the content of the research methods consisting of research design, population and sample, the instrumentation, the data collection, the ethical considerations, and data analysis.

Research Design

The descriptive correlational design was used to examine the level of family hardiness, social support, and TBI family caregivers' well-being. In addition, the relationship between family hardiness and well-being and the relationship between social support and well-being in TBI family caregivers were studied.

Population and Sample

Population

The population of this study was the family caregivers of TBI persons.

Target Population

The target population was the family caregivers who took the main responsibility in caring for TBI persons in a southern part of Thailand.

Sample

The sample of this study was the family caregivers of TBI persons. The sample was recruited from the neurosurgical outpatient departments of two tertiary government hospitals, in the southern part of Thailand.

The purposive sampling method was used based on the following inclusion criteria which were:

Inclusion criteria for TBI person

A person who was diagnosed as moderate to severe TBI ($GCS \leq 12$) and had been discharged from one of the two tertiary government hospitals was recruited in this study. The moderate to severe TBI persons were selected because these groups were more likely to have more impacts from the injury both on themselves and their family caregivers.

Inclusion criteria for family caregiver

1. Age was over 18 years old.
2. Providing the majority of care for TBI person at home for at least one month post discharge.
3. Ability to communicate in Thai language.

Sample Size Calculation

The number of participants has been estimated based on a power analysis of bivariate correlation test (Pearson's Product Moment Correlation Coefficient). The previous study of Niyomthai et al. (2003), which was conducted on the relationship between family hardiness and well-being of stroke caregivers, and the study of Ergh et al. (2003), which determined the relationship between social support

and satisfaction with life (subjective well-being) of TBI caregivers, have provided the correlation coefficient (r) to calculate the estimated sample size. The correlation coefficient (r) between family hardiness and caregivers' well-being was .44 and the correlation coefficient (r) between social support and caregivers' well-being was .40. In this study, the significant criterion (α) was set at .05 and the statistic power was .80. According to Polit and Hungler (1999, *p.*495), the estimated sample size table to achieve the selected level of power was shown. For a significant criterion (α) of .05, a statistic power of .80, with an approximate correlation (r) of .40; the estimated sample size was found to be 50 participants for each pair of correlations. Hence, the minimum estimated sample size was found to be 50 TBI family caregivers. Due to the previous studies of Niyomthai et al. (2003), which was conducted on stroke family caregivers, and Ergh et al. (2003) study on TBI family caregivers in a western country, the effect size was reduced from a large to medium effect size of .30 (Polit & Hungler, 1999). From the effect size of .30, the minimum estimated sample size was 88 participants. To increase the statistic power of this current study, therefore, the sample size of TBI family caregivers was collected to 100 participants. The approximate statistical power for these 100 participants was .85 (Polit & Hungler, 1999).

Instrumentation

The instrumentation section included the type and quality of the instruments. The quality of the instrument involved the validity and reliability tests.

Instruments

The instruments of this study consisted of four parts which were: (1) the Demographic Data Form both for caregivers and TBI persons, (2) Family Hardiness Index (FHI), (3) Social Support Index (SSI), and (4) Family Member Well-Being Index (FMWB). The detail of the construct and scoring for each instrument are presented as follows:

Part 1: Demographic Data Form

The Demographic Data Form consisted of two forms which were:

1. Demographic Data Form for TBI family caregivers. It consisted of age, gender, marital status, religion, educational level, occupation, number of family members, family income, health status, history of the illness, relationship to TBI person, duration of caregiving, hours spent per day in caring for the TBI person, previous experience as a caregiver, training as a TBI caregiver, responsibilities to other dependent persons, and place of residency (Appendix C).
2. Demographic Data Form for TBI persons. It consisted of age, gender, religion, marital status, educational level, work status, cause of TBI, type of brain injury at admission, severity of brain injury at admission, other present medical illnesses, complications at present, special care needs at present, readmission history, Glasgow Coma Score (GCS) at present time, the patient's functional status (this was measured by the Functional Independent Measure and Functional Assessment Measure), and medical payments (Appendix D).

Part 2: Family Hardiness Index (FHI)

The Family Hardiness Index (FHI) in the Thai version that has been translated via the back translation process by Niyomthai et al. (2003) was used to measure the characteristics of hardiness as a form of stress resistance resources within the family. The Thai FHI consists of 20 items that measure four components which are: (1) co-oriented commitment (8 items), (2) confidence (4 items), (3) challenge (5 items), and (4) control over family life (3 items). It is a 4-point Likert scale (0 to 3) with response scales ranging from false to true (false = 0, mostly false = 1, mostly true = 2, and true = 3). There were nine negative items which were the item numbers 1, 2, 3, 8, 10, 14, 16, 19, and 20. These negative items were reversed scoring from 0 (true) to 3 (false) before summing. Therefore, the possible range of the total score was from 0 to 60. (Niyomthai et al., 2003; Puasiri et al., 2011) (Appendix E).

Part 3: Social Support Index (SSI)

The social support regarding the perception of the family caregivers was measured using the Thai version of Social Support Index (SSI), which has been translated via the back translation process and was modified by Rungreangkulkij (2000). This Thai version consists of 14 items and a 4-point Likert scale (0 = strongly disagree to 3 = strongly agree). There were six items in the original SSI that were deleted due to measuring the intra-family support (items no. 2, 3, 7, 9, 12, 17). The additional last three items were added in order to make the SSI more relevant to Thai culture (items no. 12, 13, 14). These three items are: (1) This community has social welfare or organizations to help the members, (2) My family and I get support from our neighbor, and (3) Health care providers visit my family and give suggestions for

how my family can take care of the ill family member. There were three negative items which were the item numbers 6, 8, and 9. These negative items were reversed scored from 0 (strongly agree) to 3 (strongly disagree) before summing. Therefore, the total score could range from 0 to 42 (Rungreangkulkij, 2000) (Appendix F).

Part 4: the Family Member Well-Being Index (FMWB)

The Family Member Well-Being Index (FMWB) Thai version that has been translated by Niyomthai et al. (2003) via the back translation process was used to measure the subjective well-being of caregivers in terms of family caregivers' evaluation of his/her life condition regarding overall emotional and physical condition while caring for a TBI person. The emotional and physical conditions consist of health, tension, energy, cheerfulness, fear, anger, sadness, and general health concerns. It is an 8-item instrument with a 10-point numeric rating scale that ranges from 0 (not at all) to 10 (very much). There were six negative items which were the item numbers 1, 2, 5, 6, 7, and 8. These negative items were reversed scored from 0 (very much) to 10 (not at all) before summing the overall of well-being. The total score was obtained by summing the number as circled by the respondents and it could range from 0 to 80. The instrument could be used to record the level of concern regarding the physical, mental health, and emotional well-being of the family member (Niyomthai et al., 2003; Pasquale, Pasquale, Baga, Eid, & Leske, 2010) (Appendix G)

Quality of the Instruments

The validity test

The content and construct of the FHI, SSI, and FMWB were validated by three experts in neurosurgical and family nursing care. The first person was a nurse lecturer who is an expert in the Family Resiliency Model. The second expert was a nurse lecturer who is an expert in the community of nursing. The last expert was an advanced practice nurse who is working at a neurosurgical intensive care unit. The instruments were also checked regarding the suitability of language, the clarity and readability. The results of the scale content validity index (S-CVI) of the FHI, SSI, and FMWB were found at .92, .94, and .92, respectively. In addition, the FHI, SSI, and FMWB were tested regarding an appropriateness and understanding of the language by one TBI family caregiver.

The reliability test

The reliability of FHI, SSI, and FMWB were tested for internal consistency with 98 TBI family caregivers. These showed overall Cronbach's alpha coefficients of .70, .80, and .80 for the FHI, SSI, and FMWB, respectively. The acceptable Cronbach's alpha coefficient used in this study was equal to or more than .70 (Gliem & Gliem, 2003).

Interpretation

The interpretation for well-being, social support, patient's functional status, and family hardiness were categorized into three levels of low, moderate, and high. They were calculated based on the possible maximum total mean score minus

the possible minimum total mean score, and then divided by the number of levels that is three as shown in the following section (Best, 1977):

$$\frac{\text{Possible maximum total mean score} - \text{Possible minimum total mean score}}{3}$$

Well-being

Interpretation of the overall well-being (possible mean score = 0 - 80).

Low level = 00.00 - 26.60

Moderate level = 26.61 - 53.20

High level = 53.21 - 80.00

Interpretation for each item of well-being (possible mean score = 0 - 10).

Low level = 0.00 - 3.33

Moderate level = 3.34 - 6.67

High level = 6.68 - 10.00

Social support

Interpretation of the overall social support (possible mean score = 0 - 42).

Low level = 00.00 - 14.00

Moderate level = 14.01 - 28.00

High level = 28.01 - 42.00

Patient's functional status

Interpretation of the overall patient's functional status (possible mean score = 30 - 210).

Low level	= 30.00 - 90.00
Moderate level	= 90.01 - 150.00
High level	= 150.01 - 210.00

Interpretation for each subscale of patient's functional status.

1. Motor scale (possible mean score = 16 - 112)

Low level	= 16.00 - 48.00
Moderate level	= 48.01 - 80.00
High level	= 80.01 - 112.00

2. Cognitive scale (possible mean score = 14 - 98)

Low level	= 14.00 - 42.00
Moderate level	= 42.01 - 70.00
High level	= 70.01 - 98.00

Family hardiness

The mean scores of overall family hardiness and each component were calculated as a mean percentage in order to standardize the scores. They were calculated by using an actual mean score of overall family hardiness or each component divided by their possible highest score, and then multiplied by one hundred.

$$\frac{\text{An actual mean score of total family hardiness or each component}}{\text{Possible highest score of total family hardiness or each component}} \times 100$$

The mean percentage of overall family hardiness (possible mean% scores = 0.00 - 100.00) was categorized into three levels that similar to well-being, social support, and patient's functional status as follows (Best, 1977):

Low level	= 00.00 - 33.33%
Moderate level	= 33.34 - 66.66%
High level	= 66.67 - 100.00%

Data Collection

The data collection procedures consisted of two phases; (1) Preparation phase and (2) Implementation phase as follows:

Preparation Phase

1. Research assistance (RA) training. One RA was trained to collect the data at the neurosurgical outpatient department of one tertiary hospital. The researcher selected a RA who was a neurosurgical registered nurse and had experience on conducting research in TBI family caregivers. The researcher explained the study purposes, target population and sample, the process of data collection that involved the purpose of the data collection; the area and method of data collection; the instruments and the scoring, as well as explaining the ethical considerations. After that, the RA demonstrated her understanding of the instruments and the process of data collection to the researcher.

2. Ethical and data collecting permission. After having received ethical approval from the Faculty of Nursing, Prince of Songkla University, a formal letter was sent to the directors of the two tertiary government hospitals. This process was for obtaining data collecting permission and ethical approval from the Institutional Review Board (IRB) of each hospital (Appendix J).

Implementation Phase

1. Outpatient nurses were contacted and a list of patients was reviewed. After the study was approved and clearance from the hospital was given to conduct the research on TBI persons, the researcher/RA contacted the head nurse of the neurosurgical outpatient department in each hospital to ask for their cooperation. The information regarding the study and purposes were explained. The researcher/RA then asked for permission to review names and diagnoses of TBI persons to screen for the inclusion criteria.

2. Patients' demographic and medical information recording. The medical information and some of demographic data of TBI persons were noted before approaching them.

3. TBI persons and family caregivers contact. TBI persons were contacted by the researcher/RA according to the names on the list. The researcher/RA introduced herself and the TBI persons and family members were asked about the family caregivers for screening in regards to the inclusion criteria. After a family member identified him/herself as a primary family caregiver and met the inclusion criteria, the researcher/RA asked him/her for study participation. The informed consent form was signed if he/she was willing to participate. In addition, the family

caregivers received the information that they had the right and freedom to withdraw at anytime without any impact on them (Appendix A).

4. Completing questionnaires. After the informed consent was signed, the family caregivers were asked to complete the questionnaires. The details of all the questionnaires were explained and the researcher/RA allowed time to answer the questions. The researcher/RA helped to clarify any questions as necessary. However, if some family caregivers did not have a lot of time available to complete the questionnaires at the hospital, they were asked to complete the questionnaires by telephone interview or by a home visit. The interview took around 45 to 60 minutes. Finally, the total number of TBI family caregivers collected was 100 persons. There were 80 family caregivers who completed the questionnaires at the outpatient departments, 14 family caregivers completed the questionnaires by telephone interviews, and 6 family caregivers completed the questionnaires at their home.

5. Verifying the questionnaires and preparing for data analysis. After each case had finished, the answers in the questionnaires were checked for whether the family caregivers had fully completed them. After this, all the questionnaires were prepared for data analysis by using a statistic program.

Ethical Consideration

This study was approved by the Institutional Review Board (IRB) of the Faculty of Nursing, Prince of Songkla University and two tertiary government hospitals, in the southern part of Thailand. The human rights of the participants in this study were respected. The researcher explained the purposes of this study, the

processes of data collection, the benefit of the study, the harm of participation (e.g., exhaustion to answer all of the questions or the psychological harm), as well as the participants' right to participate or refuse at any time without any effect on the service or treatment of their TBI persons. In addition, the participants who were willing to participate were asked to give verbal agreement or signed informed consent in order to assess in more details the participants and TBI persons. If the participants had an alteration in their health condition and could not give information completely, the participants had the right to discontinue answering the questions. Moreover, the participants were assured that all of the data were kept confidentially, that any information provided was reported only as group data, and the researchers would not disclose any of the data to a third party (Appendix A).

Data Analysis

Two types of statistics were used for the data in this study, which were the descriptive and inferential statistics as follows:

The descriptive statistics consisted of the frequency, percentage, mean, standard deviation, median, interquartile range (IQR), and range that were used to describe the demographic data and medical information of family caregivers and TBI persons, family hardiness, social support, and family caregivers' well-being.

For the inferential statistic, correlation between the study variables including family hardiness, social support, and well-being were analyzed by using Pearson's Product Moment Correlation Coefficient. In addition, the assumption of

normality, linearity, and homoscedasticity were tested among these variables before using this inferential statistic.

The first assumption tests of 100 participants found abnormal distribution of family hardiness and social support. There were no missing values due to the double entry of the data and differences being checked. The inspection of Bloxplot was used to detect and make a decision for removing the extreme scores which were outliers. There were two cases that showed extreme low scores. Therefore, these two cases of participants were removed (Pallant, 2011). After the removal of the two cases, the assumptions were again tested. The normality test of the variables of family hardiness, social support, and well-being were determined by using a normal probability plot, skewness and kurtosis. The normal probability plot of the histogram showed a normal distribution shape among the study variables and the normal P-P plot also showed that the data points lay straight along a diagonal line from the bottom left to top right. The skewness and kurtosis values of these variables were ranged in an acceptable critical value of ≤ 3.29 (Kim, 2013). Next, the assumption of linearity and homoscedasticity were tested by the inspection of a scatter plot. The scatter plots showed the data points were quite roughly rectangularly distributed and most of the scores of the variables were quite concentrated in the center with some spread out. In summary, the 98 sets of data have shown normality distribution which shows no data violation and they have met the assumption tests (Appendix I).

These 98 sets of data cases were used to analyze the relationships between family hardiness and well-being, and social support and well-being of the family caregivers. After Pearson's Product Moment Correlation Coefficient was

employed, the results showed that there were non-significant relationships between these variables. Consequently, the statistic of multiple regressions could not be performed further. Therefore, the researcher examined the levels of family hardiness, social support, well-being, and the relationships of these variables.

Chapter 4

Results and Discussion

The results and discussion from the study findings are presented in this chapter in the following sections.

1. The demographic data of TBI family caregivers and TBI persons
2. The level of the family hardiness, social support, and well-being of TBI family caregivers
3. The relationships of the family hardiness, social support and well-being of TBI family caregivers

Results

The Demographic Data of Family Caregivers and TBI Persons

Demographic data of family caregivers

The family caregivers' mean age was 44.94 years ($SD = 12.11$) and was ranged from 31 to 50 years old. The majorities of the participants were female (81.63%), Buddhist (84.69%), and married (78.57%). Half of the caregivers had completed education at an elementary school (50.00%). Most of them were working while providing care for TBI persons (81.63%). The family caregivers perceived their health as good (58.17%) and had no underlying diseases (65.31%). All of the family caregivers had family members equal to or more than two persons. The relationship between the caregivers and TBI persons was found to be forty percent were a parent

and one fourth of them were spousal caregivers. The duration of caregiving ranged from one month to eleven years (*Median* = 8 months, *IQR* = 23 months). Approximately half of the participants were taking care of TBI persons for two to eight hours per day (53.06%) and 38.78% of them had to take care of other dependent persons as well (e.g., child, elderly person, other patients). Some of the participants had experience as a caregiver (22.45%) and 58.17% of them were trained by nurses in the hospital for patient care. Approximately, seventy percent of the participants were living in rural communities (Table 1).

Table 1

Frequency and Percentage of Family Caregivers' Characteristics (N = 98)

Characteristics	<i>n</i>	%
Age (<i>Min</i> - <i>Max</i> = 20 - 73), <i>M</i> (<i>SD</i>) = 44.94 (12.11)		
20 - 30	16	16.33
31 - 50	50	51.02
51 - 60	21	21.43
> 60	11	11.22
Gender		
Male	18	18.37
Female	80	81.63
Marital status		
Single	8	8.16
Married	77	78.57
Divorced/Widowed/Separated	13	13.27
Religion		
Buddhist	83	84.69
Islamic	14	14.29
Christian	1	1.02
Educational level		
No education	1	1.02
Elementary education	49	50.00
High school	19	19.39
Vocational school	11	11.22
Bachelor degree	18	18.37
Occupation		
No occupation/ Retired	18	18.37

Table 1 (continued)

Characteristics	<i>n</i>	%
Farmer	32	32.65
Employee	24	24.49
Business	17	17.35
Government officer	7	7.14
Family members (persons)		
2 - 4	54	55.10
≥ 5	44	44.90
Family income (baht/month) (<i>Min-Max</i> = 0 - 100,000), <i>median</i> = 10,000, <i>IQR</i> = 13,000		
≤ 10,000	52	53.06
10001 - 20,000	23	23.47
20,001 - 30,000	17	17.35
> 30,000	6	6.12
Sufficiency of income		
Surplus	9	9.18
Sufficient	53	54.08
Indebted	36	36.74
Health status		
Good	57	58.17
Quite good	31	31.63
Poor	10	10.20
Underlying disease (co-morbidities)		
No	64	65.31
Yes*	34	34.69
Heart disease/Dyslipidemia/Diabetes/Hypertension	21	61.76
Allergy	6	17.65
Gastritis/Migraine	4	11.77
Rheumatoid/Gout/Low back pain	3	8.82
Hypothyroidism	3	8.82
Hypotension	2	5.88
Relationship with TBI person		
Parent	39	39.80
Spouse	25	25.50
Child	17	17.35
Sister/Brother/Relatives	17	17.35
Duration of caregiving (month) (<i>Min-Max</i> = 1 month – 11 years), <i>median</i> = 8 months, <i>IQR</i> = 23 months		
1 - 6	43	43.88
7 - 12	23	23.47
> 12	32	32.65

Table 1 (continued)

Characteristics	<i>n</i>	%
Hours of caring per day, median = 8 hours, IQR = 12		
2 - 8	52	53.06
9 - 16	23	23.47
17 - 24	23	23.47
Experience as a caregiver		
No	76	77.55
Yes	22	22.45
Training about caregiving by nurses		
No	41	41.83
Yes	57	58.17
Caring for other dependent persons		
No	60	61.22
Yes (i.e. child, elderly, other patients)	38	38.78
Caregiving' s place		
Rural	70	71.43
Urban	28	28.57

Note. *One caregiver has at least one disease

Demographic data of TBI persons

According to Table 2, the TBI persons' characteristics are shown. The TBI persons' average age was 38.34 years (*Median* = 34, *IQR* = 33). The majority of them were male (81.63%) and half of them were single (50.00%). Almost all of them were injured caused by motorcycle (81.63%) and car accidents (6.12%), and the severity of TBI at admission was mostly severe TBI (67.35%). After discharge from hospital, some of them had a history of readmission (33.67%). In addition, they had some complications after discharge (48.98%), such as respiratory infections and other infections, seizures, pressure sores, joint stiffness, dizziness, headaches, and hydrocephalus. Around thirty percent of the TBI patients had a history of other

illnesses while receiving care such as cerebrovascular accident (CVA), hypertension (HT), diabetes (DM), dyslipidemia (DLP), asthma, allergy, gout, and heart disease. Twenty-eight TBI persons still needed special care after discharge including tracheostomy tube care, tube feeding, urinary catheter, ventriculostomy and lacrimal shunt care. The current GCS was mostly at 13 to 15 (68.36%) and their functional status was at a moderate level. The majority of the TBI patients had discontinued their work after discharge (88.78%). They had received more than one medical payment support from the government or other health organizations including the universal health care coverage, social insurance, act protection for motor vehicle accident victims, reimbursement, disabled rights, and community health care volunteer rights.

Table 2

Frequency and Percentage of TBI Persons' Characteristics (N = 98)

Characteristics	<i>n</i>	%
Age (<i>Min-Max</i> = 12 - 81), <i>M (SD)</i> = 38.34 (18.13), <i>median</i> = 34, <i>IRQ</i> = 33		
Gender		
Male	80	81.63
Female	18	18.37
Marital status		
Single	49	50.00
Married	39	39.80
Divorced/Widowed/Separated	10	10.20
Religion		
Buddhist	83	84.69
Islamic	15	15.31
Educational level		
No education	5	5.10
Elementary education	39	39.80
High school	37	37.76
Vocational school	11	11.22
Bachelor degree	6	6.12
Occupation after TBI		
No occupation/Retired	87	88.78
Famer	2	2.04
Employee	5	5.10

Table 2 (continued)

Characteristics	<i>n</i>	%
Government officer	4	4.09
Medical payment support*		
Universal health care coverage	75	76.53
Social insurance	19	19.39
Act protection for motor vehicle accident victims	26	26.53
Reimbursement	11	11.22
Disabled rights	9	9.18
Community health care volunteer rights	3	3.06
Self-payment	1	1.02
History of other illness		
No	69	70.41
Yes*	29	29.59
Hypertension/Dyslipidemia/Diabetes mellitus	14	48.28
Allergy/Asthma	6	20.69
CVA	5	17.25
Heart disease/Peripheral neuropathy	3	10.34
Gout/Thalassemia	2	6.89
Cause of TBI		
Motorcycle accident	80	81.63
Car	6	6.12
Fall	8	8.16
Other (i.e., bodily assault and pedestrian injuries)	4	4.09
Type of brain injury at admission		
Fracture of skull	9	9.18
Epidural hematoma (EDH)	10	10.20
Subdural hematoma (SDH)	34	34.69
Subarachnoid hemorrhage (SAH)	14	14.29
Intracranial hemorrhage (ICH) /Diffused axonal injury (DAI)	12	12.25
SDH, SAH, ICH, DAI	19	19.39
Severity of brain injury at admission		
Moderate (GCS = 9 - 12)	32	32.65
Severe (GCS ≤ 8)	66	67.35
Special care need at present time		
No	70	71.43
Yes (tracheostomy tube, tube feeding, urinary catheter, ventriculostomy, lacrimal shunt)	28	28.57

Table 2 (continued)

Characteristics	<i>n</i>	%
Complications at present time		
No	50	51.02
Yes*	48	48.98
Infection (respiratory, urinary tract and wound)	23	47.92
Pressure sores/joint stiffness/foot drop	15	31.25
Seizure	12	25.00
Dizziness/headaches	11	22.92
Spasticity	5	10.42
Hydrocephalus	2	4.17
Glasgow coma score at present time		
3T - 8T	14	14.29
9 - 12	17	17.35
13 - 15	67	68.36
History of readmission		
No	65	66.33
Yes	33	33.67
Functional status		
Overall range = 30-210 ($M = 132.89$, $SD = 60.56$), overall = moderate level		
Motor scale, range = 16-112 ($M = 70.80$, $SD = 35.32$)		
Low level	32	32.65
Moderate level	17	17.35
High level	49	50.00
Cognitive scale, range = 14-98, ($M = 62.10$, $SD = 27.83$)		
Low	27	28.57
Moderate	22	21.43
High	49	50.00

Note. *One patient has at least one illness and/ or one complication

The Family Hardiness, Social Support, and Well-Being of TBI Family Caregivers

The family hardiness

According to table 3, family hardiness shows the overall mean percentage at a high level ($Mean = 84.08\%$). When considering each component, the co-oriented commitment component has shown the highest mean percentage ($Mean = 92.00\%$) and the lowest mean percentage is the control component ($Mean = 67.89\%$).

Table 3

Range, Mean, Standard Deviation, and Mean Percentage of Family Hardiness (N = 98)

Variable	Possible range	Actual range	<i>M (SD)</i>	<i>Mean%</i>	Level
Overall family hardiness	0 - 60	37 - 59	50.45 (4.51)	84.08	High
1. Overall Co-oriented Commitment	0 - 24	16 - 24	22.08 (1.87)	92.00	
- Believe the things will work out for the better if they work together as a family	0 - 3	2 - 3	2.91 (0.29)		
- Strive together and help each other no matter what	0 - 3	2 - 3	2.85 (0.36)		
- Count on each other to stand by them in times of need even they don't always agree	0 - 3	2 - 3	2.81 (0.40)		
- Work together to solve the problem	0 - 3	2 - 3	2.78 (0.42)		
- Feel they can trust that even in difficult times things will work out	0 - 3	1 - 3	2.77 (0.45)		
- Have a sense of being strong even they face big problems	0 - 3	1 - 3	2.69 (0.49)		
- Listen to each other's problems, hurts and fears	0 - 3	2 - 3	2.66 (0.48)		

Table 3 (continued)

Variable	Possible range	Actual range	<i>M (SD)</i>	<i>Mean%</i>	Level
- Bad things that happen to them are balanced by the good things that happen in the long run	0 - 3	1 - 3	2.62 (0.51)		
2. Overall Confidence	0 - 12	6 - 12	10.92 (1.05)	91.00	
- Live does not seem dull and meaningless	0 - 3	1 - 3	2.90 (0.34)		
- Can survive if another problem hits them	0 - 3	1 - 3	2.87 (0.40)		
- Work and efforts are appreciated	0 - 3	0 - 3	2.60 (0.64)		
- It is wise to plan ahead and hope because things will turn out	0 - 3	0 - 3	2.55 (0.63)		
3. Overall Challenge	0 - 15	3 - 15	11.34 (2.32)	75.60	
- Try new and exciting things when their families plan activities	0 - 3	1 - 3	2.69 (0.49)		
- Encourage each other to try new things and experiences	0 - 3	0 - 3	2.57 (0.64)		
- Tend to not do the same things over and over, so it's not boring	0 - 3	0 - 3	2.33 (0.85)		
- Be encouraged to be active and learn new things	0 - 3	0 - 3	2.26 (0.85)		
- Better to go out and do things with others than stay at home	0 - 3	0 - 3	1.49 (0.90)		
4. Overall Control	0 - 9	0 - 9	6.11 (1.76)	67.89	
- Trouble results do not come from mistakes they make	0 - 3	0 - 3	2.33 (0.82)		
- Realize their lives are not controlled by accidents and luck	0 - 3	0 - 3	1.96 (0.96)		
- Most of the unhappy things that happen to them are not due to bad luck	0 - 3	0 - 3	1.83 (0.89)		

The social support

According to table 4, the overall mean score of social support is shown at a high level ($M = 33.47$, $SD = 5.19$, $Range = 21- 42$). When considering each item, the highest score on the three items were explained as “the communities that the caregivers are living in were very good to bring up their children” ($M = 2.76$, $SD = 0.46$), “they felt secure when they live in their communities” ($M = 2.76$, $SD = 0.50$), and “they do not need to be too careful with their friends when they do something for friends because friends will not take advantage of them” ($M = 2.70$, $SD = 0.54$). While the lowest scores were three items that are explained as “the health care providers visit the families and give suggestions regarding how to take care of the TBI persons” ($M = 2.18$, $SD = 0.97$), “they felt secure that they are as important to friends as their friends are” ($M = 2.14$, $SD = 0.79$), and “their friends in the community are a part of their daily activities” ($M = 1.93$, $SD = 0.72$).

Table 4

Range, Mean, and Standard Deviation of Social Support (N = 98)

Items	Possible range	Actual range	$M (SD)$	Level
Overall social support	0 - 42	21 - 42	33.47 (5.19)	High
1. People that even caregivers do not know in the community would be willing to help in times of emergency	0 - 3	0 - 3	2.21 (0.87)	
2. People in the community can get help from the community in times of trouble	0 - 3	0 - 3	2.28 (0.72)	
3. Caregivers have friends who let them know that their friends value them and what they can do	0 - 3	0 - 3	2.37 (0.77)	
4. People can depend on each other in the community	0 - 3	1 - 3	2.41 (0.61)	
5. Caregivers' friends in the community are a part of their daily activities	0 - 3	0 - 3	1.93 (0.72)	

Table 4 (continued)

Variable	Possible range	Actual range	<i>M (SD)</i>	Level
6. Caregivers do not need to be too careful when they do something for friends because their friends will not take advantage of them	0 - 3	1 - 3	2.70 (0.54)	
7. Caregivers feel secure when they live in their communities	0 - 3	0 - 3	2.76 (0.50)	
8. The communities have people that are friendly with each other	0 - 3	1 - 3	2.37 (0.58)	
9. The communities are very good to bring children up in	0 - 3	1 - 3	2.76 (0.46)	
10. Caregivers feel secure that they are important to their friends as friends are to them	0 - 3	0 - 3	2.14 (0.79)	
11. Caregivers have close friends outside the family who they know really care for and love them	0 - 3	0 - 3	2.43 (0.79)	
12. The community has social welfare or organizations to help the members	0 - 3	1 - 3	2.59 (0.53)	
13. The families and caregivers get support from their neighbors	0 - 3	0 - 3	2.35 (0.83)	
14. Health care providers visit the families and gives suggestions for how members can take care of the TBI persons	0 - 3	0 - 3	2.18 (0.97)	

The well-being

According to table 5, the TBI family caregivers show overall well-being at a moderate level. In addition, two-thirds of them had low levels of anger (66.33%) and approximately, half of the family caregivers had high energy levels (54.08%). On the other hand, they have reported moderate to high tension (79.61%), and reported high levels of concern in regards to TBI person's health (69.39%).

Table 5

Range, Frequency, and Percentage of TBI Family Caregivers' Well-Being (N = 98)

Variable	Possible range	Actual range	N (%)			Level
			High	Moderate	Low	
Overall well-being	0 - 80	5 - 76	28 (28.57)	57 (58.16)	13 (13.27)	Moderate
Anger	0 - 10	0 - 10	6 (6.12)	27 (27.55)	65 (66.33)	
Energy	0 - 10	0 - 10	53 (54.08)	34 (34.69)	11 (11.23)	
Sadness	0 - 10	0 - 10	26 (26.53)	27 (27.55)	45 (45.92)	
Cheerfulness	0 - 10	0 - 10	38 (38.78)	39 (39.80)	21 (21.42)	
Fear	0 - 10	0 - 10	27 (27.55)	33 (33.67)	38 (38.78)	
General health	0 - 10	0 - 10	32 (32.65)	29 (29.59)	37 (37.76)	
Tension	0 - 10	0 - 10	35 (35.71)	44 (44.90)	19 (19.39)	
Member' health concerns	0 - 10	0 - 10	68 (69.39)	20 (20.41)	10 (10.20)	

The Relationships of the Family Hardiness, Social Support and Well-Being of TBI Family Caregivers

The Pearson's product moment correlation was used to analyze the relationships between the family hardiness, social support, and TBI family caregivers' well-being. According to Table 6, there is no relationship between the family hardiness and well-being ($r = .004, p > .05$) and the relationship between the social support and well-being of TBI family caregivers ($r = .09, p > .05$) (Table 6).

Table 6

Pearson Product Moment Correlations of Well-being (N = 98)

Variables	Family hardiness	Social support
1. Family hardiness	1	
2. Social support	.267**	1
3. Well-being	.004	.09

** $p < .01$

Discussion

The results of the family caregivers and TBI person characteristics, family hardiness, social support, TBI family caregivers' well-being, and the relationships between well-being in regards to the family hardiness, and social support are discussed in this part.

The Characteristics of Family Caregivers

According to the results, the majority of the TBI family caregivers were female who were parents or spouses in the working age group. The results were consistent with the previous studies in that mothers or wives have often taken on the responsibility as a caregiver for their son or husband (Narkthong, 2014; Samartkit et al., 2010). In Thai society, caring for an ill family member was assigned to a female due to some cultural expectations and the perception that it is a major role of women to take charge of household chores and to take care of family members who are sick (Meecharoan et al., 2013; Ondee et al., 2013). Half of the family caregivers had an

elementary education level that may be due to most of them were living in rural areas and income here is quite low. As a result, they may have less of a chance to access educational services. This result was similar to previous studies (Kaewsriwong, 2006; Prabripoo et al., 2013).

In addition, the current finding showed the majority of family caregivers earn an income and mostly worked as a farmer and employee which is similar to previous studies (Narktong, 2013; Potaya, 2002; Prabripoo et al., 2013). In Thailand, the average monthly income per household in 2015 was 26,915 baht compared with the family caregiver monthly income of this study which was around 13,000 baht (The Household Socio-economic Survey, National Statistical Office, Ministry of Information and Communication Technology, 2016). These characteristics indicated that the family caregiver might have limited abilities and the necessary resources to provide quality of care for the TBI person in the long term (Kaewsriwong, 2006).

The caregiving duration was ranked from one month to eleven years because most of the TBI persons were at a severe level and needed long term care (Kaewsriwong, 2006; Livingston et al., 2010). Because of the extended family structure, all of the family caregivers had family members to assist in caregiving. These results are similar to other caregiving studies in Thailand (Kaewsriwong, 2006; Narktong, 2013; Niyomthai et al., 2003).

The Characteristics of TBI Persons

The TBI persons were in the adult age group and the majority of them were male. TBI was mainly caused from motorcycle accidents. This may be explained

in that most of the TBI persons in this study were students and workers prior to their injury, and motorcycles were the type of vehicle they used for their work. Also the male teenagers and male adults might have higher risk behaviors while driving (e.g., not using a helmet, driving too fast, and drunk driving) that could cause an accident (Samartkit et al., 2010). This result was similar to previous TBI studies (Kaewsriwong, 2006; Kreutzer et al., 2009; Narktong, 2013).

Most of the persons in this study were diagnosed as severe TBI with subdural hematoma. The subdural hematoma was associated with brain damage. It has contributed to partial dysfunction that created some impairment (Samartkit, 2010). Consequently, most of the TBI persons in this study had motor and cognitive functional status at a moderate level after injury. Some severe TBI persons have complications such as seizure, respiration infection, pressure sores, spasticity, and hydrocephalus and special care needs such as tracheostomy and ventriculostomy shunt care. Similarly, the other studies have shown that several complications were found post severe TBI, for example, epilepsy, joint stiffness, and respiratory infections (Gainer, 2015; Godbolt et al., 2015; Livingston et al., 2010; Narkthong, 2014).

The Family Hardiness

The overall family hardiness in this study was at a high level. This indicated that the family caregivers perceived high internal strength when they were faced with stressful caregiving situations (McCubbin et al., 2001). This is congruent with the previous studies of caregivers of adults and the elderly with chronic illnesses (Chen, 2004; Clark, 2002; Franklin, 2003). Moreover, with regard to each component

of family hardiness, the TBI family caregivers perception of co-oriented commitment had the highest mean percentage, followed by confidence, challenge, and control.

According to the highest mean percentage of the co-oriented commitment component, this finding is relevant to previous studies (Chen, 2004; Clark, 2002; Franklin, 2003; Meecharoen et al., 2013). This possibly explains that family caregivers perceived the strength of family relationships and family functioning in caring for their TBI patients with a sense of love between parents and children, and couples. These influence family caregivers and family members to have a commitment in the caregiving role by engaging in stressful situations and working/helping each other together to solve any problems. Consistently, the statement of co-oriented commitment that was most frequently reported by family caregivers in this study was explained in that they believed that things will work out for the better if they work together as a family.

Moreover, confidence had the second highest mean percentage of the hardiness component that family caregivers perceived in this study. It means that the family caregivers have the sense of being able to handle caregiving problems and endure hardships (McCubbin et al., 2001). It may be because more than half of the caregivers in this study were trained in caregiving from nurses before the patient was discharged and the caregivers had gained direct experiences from caring for their TBI persons post discharge. Increasing knowledge and experiences may make these caregivers feel a sense of security in caring for their sick loved one and they may have viewed these caregiving problems as interesting and meaningful situations for them (Huang, 1996). Therefore, the strengthening of family relationships and family functioning and the increase of knowledge and experience in caregiving are possibly

important factors that lead family caregivers to have commitment and confidence in caregiving which in this study resulted in an overall high family hardiness perception.

The Social Support

The overall social support in this study was at a high level as similar to other studies (Daonophakao, 2004; Kaewsriwong, 2006) This indicated that TBI family caregivers perceived high support from external resources involving persons and institutions that they could access and use to meet their demands (McCubbin et al., 2001). These supports included help from both relatives and neighbors in the rural community, the government and other organizations (e.g., universal health care coverage, social insurance, disabled rights). Similarly, the previous caregivers' studies of Daonophakao (2004), Kaewsriwong (2006), and Yamashita et al. (2013) found social support was high from relatives and friends, especially emotional and esteem support.

The TBI family caregivers have reported people in their communities; especially, neighbors help each other without taking advantage of them. This may be because the majority of the caregivers are living in rural communities where they may have close relationships with other people and thus receive more support from people who were their extended family members or relatives and friends (Rattanasuk et al., 2013). Moreover, the previous study showed people in Thai communities usually show compassion and goodwill for caregivers. They mostly show characteristics of friendliness, kindness, and sincerity to help others (Sethabouppha & Kane, 2005). This is supported by a previous study of Thai caregivers in the rural areas that have received high social support (Chaiyarit, 2012). As a result, the family caregivers in the

current study could receive emotional and esteem support that helps them to feel like they are a part of a good community resulting in feelings of security.

Another type of help may come from medical payment support from the Thai government and other organizations as reported by TBI family caregivers. After TBI persons were discharged from hospital, they usually received payment support for follow-up sessions including treatment; medication; and rehabilitation programs from the universal health care coverage or other health-organizations (e.g., social insurance, disbursement, disabled rights, and community health care volunteer rights). This was consistent with the previous studies, which showed that Thai patients have received support from these resources (Chiewprasit, 2003; Kaewsriwong, 2006; Samartkit, 2010). This support could reduce financial burden in caregiving. Therefore, the supports from outside of the family including persons, the government, and institutions have the ability to protect against the stressors of family caregivers. Social support seems to be a family resilience factor that could help the family caregivers to increase their adaptation (McCubbin & McCubbin, 2001; VanBreda, 2001).

The Well-Being

The TBI family caregivers in this study presented their overall well-being at a moderate level. This finding is similar to the previous study of Daonophakao (2004), Meesuk (2005), and Rattanasuk et al. (2013) in that caregivers had moderate well-being. Based on each item of well-being, it showed that family caregivers had positive well-being relating to high energy and low anger levels but had negative well-being about patient's health concerns and tension when caring for their TBI persons. These findings could possibly be explained by several factors

including the relationship between family caregivers and patients, the duration of caregiving, and the patient's illnesses and complications.

The relationship between family caregivers and TBI persons and the duration of caregiving could enhance the positive well-being of family caregivers. The current findings revealed that most of the parents and couples have taken on the responsibility as a caregiver. It showed that being in this caregiver role with love, affective relations, and good wishes is an important factor that could have motivated and empowered the family caregivers to be willing to care for their ill loved one. High energy feelings could increase the caregivers' well-being (Boonyawat & Sunsern, 2005; Charnsri, 2008; Daonophakao, 2004; Meecharoen et al., 2013; Niyomthai et al., 2003). Moreover, caring for TBI persons in the long term in this study may have led family caregivers to have more understanding of a TBI person's needs, and this can help family caregivers to cope or adapt well with stressful caregiving situations (Charnsri, 2008; Daonophakao, 2004; Ishikawa et al., 2011; Niyomthai et al., 2003). As a result, the family caregivers in the current study reported low levels of anger while caring for TBI persons.

However, the family caregivers' well-being may suffer negative effects from the TBI persons' illness and complications. Since the TBI persons had mostly sustained severe TBI injuries, they had physical and cognitive dysfunctions that have special care demands. Previous studies showed that a higher severity of a patient's disease could result in higher caregivers' health concerns and lower caregiver well-being (Boonyawat & Sunsern, 2005; Niyomthai et al., 2003). Moreover, nearly half of the TBI persons in this study had complications (e.g., seizures, hydrocephalus, spasticity, respiratory infection, urinary tract infection, and pressure sores) and

co-morbidities (e.g., asthma, diabetic mellitus, and CVA) that can threaten a person's life. Importantly, the unpredictable symptoms of TBI persons such as seizures and asthma could create stress for family caregivers. The previous study also revealed that patients' illnesses and complications could contribute to caregivers' concerns and stress regarding the patients' unstable conditions and the difficulty in managing those signs and symptoms (Daonophakao, 2004). As a result, the family caregivers in the current study showed moderate to high tension and high levels of concern about TBI persons' health, and this impacted negatively on the well-being of the caregivers.

The Relationships between Family Hardiness, Social Support, and Well-Being of TBI Family Caregivers

According to the current finding, the non-significant relationships between family hardiness, social support, and well-being of TBI family caregivers are explained together in this part. These findings were inconsistent with the other studies that showed the significant positive correlation between these variables (Jaroonsit, 2011; Lee et al., 2009; Lu et al., 2015; Niyomthai et al., 2003; Rattanasuk et al., 2013). These non-significant results are possibly caused by other factors including the TBI person's illness and complications, caregivers' education and beliefs, and community-based resources (e.g., health care services and informal network support).

The family caregivers' well-being may be related to other illnesses (co-morbidities) and complications of TBI persons. For example, asthma, seizures, and hydrocephalus are unpredictable serious illnesses that could occur at any time post TBI. In addition, half of the caregivers in this study had an education at elementary level which can negatively impact on the ability of the caregivers to assess their lives

and gain more knowledge regarding the ways to manage the complexity of TBI and the complications the patients may present with. These situations contribute to caregivers having difficulty to control and manage a crisis situation that could threaten the patient's life (Daonophakao, 2004; Noreuil, 2002; Tamtub, 2005). This was similar to the findings of other studies that showed the lower education level of caregivers resulted in a lower ability to manage a patient's illness (Boonyawat & Sunsern, 2005; Kassaye, 2012, Savundranayagam et al., 2007).

Furthermore, when the caregivers have a low level of control in managing a patient's serious illnesses and any complications, religious beliefs were used as a source of adaptation to stressful situations. The belief of previous *Karma* (previous actions) and the destiny of Thai people could have an effect on a person's control over life situations. Similarly, the caregivers may believe that their ill loved one sustained TBI resulting from bad *Karma* and bad luck and their lives were already fixed by that (Tamtub, 2005). This is supported by the lowest mean percentage of the control component of hardiness in this study, which are explained by the statements "*the unhappy things that happened to them mostly came from their bad luck*" and "*they realized that their lives were controlled by accidents and luck*" Consistently, Mark (2008) has mentioned that the persons who have powerlessness in the control of their life will be influenced by stressors and their locus of control comes from other circumstance rather than their internal locus of control. Thus, the current findings show that family caregivers had low levels in controlling stressful situations, which can suppress overall well-being. The current finding showed a moderate level of caregivers' well-being which was not as high as the family hardiness level.

Another possible factor is come from community-based resources including informal network and health care service supports for TBI family caregivers. McCubbin et al. (2001) has mentioned that network support is a part of social support. This support is referred to as the information exchanged, which can help a person in believing that he/she belongs to a network of communication involving mutual obligation and mutual understanding. It must be the sense of membership securing and maintaining in a human group. However, the caregivers in this study have reported fewer friends as being part of their daily activities and had a few secure that they are as important to their friends as their friends are to them. This may reflect the lack of informal network support such as a self-help group of TBI caregivers that they can use for sharing information of caring experiences, reflecting feelings, and participating in activities with other TBI caregivers. This could impact on the caregivers' well-being since the previous study revealed that well-being comes from feeling part of the community and personal relationships (McAllister et al., 2012). Furthermore, the caregivers in this study have reported quite lack of home visits and caring information from health care providers. This could be due to the long-term illness of TBI persons and less follow ups with a neurosurgeon at a tertiary hospital resulting in infrequent home visits. Therefore, health care support the caregivers may have received may be not enough to meet their needs; especially, for the management of a patient's illness which may impact on caregivers tension and concerns in regards to their patient's health. The previous studies have shown that support from health care services such as health care information, patient visits, and emotional support are really important to promote caregivers' well-being (Jaroonsit, 2011; Rattanasuk et al., 2013). The supports could increase caregivers' abilities to

take care of their patients and reduce tension (Jaroonsit, 2011). Although the caregivers in this study received high family support and support from relatives, there was insufficient informal network and health care service supports resulting in a lack of emotional support and health care information support. This is consistent with the information of TBI care in Thailand, which showed less in programs such as formal self-help groups and home visits that help caregivers and TBI persons when they are discharged to the community (Narkthong, 2014). Also, the current finding is similar to the study of Prombut et al. (2011) that showed caregivers reported low scores on support from health care providers. Therefore, the caregivers in the current study reported moderate to high tension and high concern of patients' health. TBI caregivers have overall high social support but this was not relevant to their well-being which showed at a moderate level.

In summary, the current findings did not totally confirm the theoretical framework of the Family Resiliency Model in the issues of the relationships between family hardiness, social support, and well-being. Apart from those factors that influenced on well-being, this model is an interaction of many components as a process within the family system. However, these components of this model have few applied to study their relationships with well-being of family caregivers in the context of Thai society. For example, education, religious beliefs, a patient's illness, family relationships, the functioning family unit, and informal network groups may influence caregivers' well-being. Therefore, other factors among family caregivers may need to be assessed to achieve the outcome of this model (Richardson, 2000).

Chapter 5

Conclusion and Recommendations

This chapter presents the conclusion of the study based on the research findings. The strength and limitations of this study and the recommendations for nursing implications on practice and research are also presented.

Conclusion

This study aimed to examine the level of family hardiness, social support, and well-being and to explore the relationships between family hardiness, social support and TBI family caregivers' well-being. The Resiliency Model of Family Stress, Adjustment, and Adaptation was used as a conceptual framework for this study. One hundred TBI family caregivers were recruited from the neurosurgical outpatient departments of two tertiary government hospitals in the southern part of Thailand based on purposive sampling. The data were collected during January to June, 2016. The study instruments consisted of the demographic form of TBI persons and family caregivers, the family hardiness index (FHI), the social support index (SSI), and the family member well-being (FMWB) index. These instruments were validated by three experts and were tested for internal consistency. The Cronbach's alpha coefficients of the FHI, SSI, and FMWB were .70, .80, and .80, respectively. After outliers were deleted, the final sample used for analysis was 98 participants. The

descriptive statistics and Pearson's Product Moment Correlation Coefficient were used for data analysis.

The findings of this study showed that the overall family hardiness was at a high level ($Mean = 84.08\%$). When considering each component, the co-oriented commitment component showed the highest mean percentage ($Mean = 92.00\%$) and the lowest mean percentage was the control component ($Mean = 67.89\%$). The overall mean score of social support was at a high level ($M = 33.47$, $SD = 5.19$). Family caregivers' well-being was at a moderate level. They reported low anger (66.33%) and high energy (54.08%) in caring for TBI persons. However, the caregivers reported moderate to high tension (79.61%) and high TBI person's health concern (69.39%). The relationship between family hardiness and caregivers' well-being had a non-significant result ($r = .004$, $p > .05$). Also, the result did not find a significant relationship between social support and caregivers' well-being ($r = .09$, $p > .05$).

Strength and Limitations of the Study

Strength of the Study

There is an important strength found in this study and that is the data collected was from Thai family caregivers who were caring for TBI persons after hospital discharge. Although this study was conducted at two tertiary government hospitals, the findings of this study provide important basic information such as the levels of family caregivers' hardiness, social support, and well-being for health care

providers to develop appropriate interventions for enhancing well-being in the TBI family caregiver.

Limitations of the Study

The two limitations are the questionnaires and generalization which were found as follows:

1. Limitation of the applicability of questionnaires. The majority of the family caregivers in this study had a low educational level. They needed more time to understand each item of the FHI and SSI questionnaires. To solve this issue, the researcher helped them to clarify some points such as “Trouble results from mistakes we make” and “I feel secure that I am important to my friends as they are to me”. This issue might affect on the family caregivers’ response related to their perception of family hardiness and social support. This would limit the further applicability of using FHI and SS questionnaires.

2. Limitation of the generalization of study. This was due to the sample being recruited by using the purposive sampling method. Therefore, this study has a limitation for a generalization to all Thai TBI family caregivers.

Implications and Recommendations

The findings of the study offer the following implications and recommendations for nursing practice and nursing research as follows:

Nursing Practice

1. It is evident in this study that TBI caregivers had a high family hardiness level. Thus, nurses should identify co-oriented commitments such as enhancing positive feelings and the appraisal of caregiving and promote the strength of family relationships and family functioning by contacting and inviting significant others (e.g., friends, relatives, neighbors) to participate or share caregiving responsibilities as early as possible after the patient's discharge.

2. Although these findings indicated caregivers rated that they had high support from relatives and neighbors, these supports may not fully help the caregivers to deal with some crisis situations. Nurse should evaluate the family's community-based resources and provide a social network group (e.g., self-help group) to facilitate the caregivers to cope or adapt with caregiver tension and concerns which may occur while caring for a TBI person in the long term.

3. The results showed that the majority of family caregivers had well-being at a moderate level. They had positive (high energy and low anger) and negative (high tension and concerns of a patient's health) well-being. Thus, nurses should provide psycho-educational interventions (e.g., counseling, giving health information via telephone and electronic materials, and facilitating self-help groups) to reduce caregivers' tension and patients' health concerns while caring for TBI persons in the community setting.

Nursing Research

1. Future research should assess family caregivers and their family members since the Resiliency Model has focused on the family as a unit. Action research is recommended in the form of active participation of significant other members to share caring responsibilities or increase the ability to work together for the development of the potential well-being of the TBI family.

2. Future research should explore other important factors that may be related to TBI family caregivers' well-being such as religious coping, family relationships, and patient illness.

3. The design should be focused on a longitudinal study that can show the systematic change of the TBI family caregivers' well-being.

4. The questionnaires (FHI and SSI) in this study were developed from the western context and they have not been well employed in various Thai contexts. Thus, the family hardiness and social support should be redefined and revised based on an appropriate measurement for Thai society.

5. Future research should expand the number of the sample to gain generalizations by using the probability sampling method and increasing the number of settings to gain better insight into the different groups of TBI family caregivers.

References

- Adeosun, II. (2013). Correlates of caregiver burden among family members of patients with schizophrenia in Lagos, Nigeria. *Schizophrenia Research and Treatment, 2013*, 1-7. doi: 10.1155/2013/353809
- Ahman, S., Saveman, B. I., Styrke, J., Bjornstig, U., & Stalnacke, B. M. (2013). Long-term follow-up of patients with mild traumatic brain injury: A mixed-method study. *Journal of Rehabilitation Medicine, 45*, 758-764. doi: 10.2340/16501977-1182
- Akpınar, B., Kucukguclu, O., & Yener, G. (2011). Effects of gender on burden among caregivers of Alzheimer's patients. *Journal of Nursing Scholarship, 43*, 248-254. doi: 10.1111/j.1547-5069.2011.01402.x
- Alatartseva, E., & Barysheva, G. (2015). Well-being: Subjective and objective aspects. *Procedia - Social and Behavioral Sciences, 166*, 36-42. doi: 10.1016/j.sbspro.2014.12.479
- Amendola, F., Oliveira, M. A. d. C., & Alvarenga, M. R. M. (2011). Influence of social support on the quality of life of family caregivers while caring for people with dependence. *The University of Sao Paulo Nursing School Journal, 45*, 880-885.
- Amjad, F., & Bokharey, I. Z. (2014). The impact of spiritual wellbeing and coping strategies on patients with generalized anxiety disorder. *Journal of Muslim Mental Health, 8*(1), 21-38. doi: 10.3998/jmmh.10381607.0008.102
- Andelic, N., Sigurdardottir, S., Schanke, A., Sandvi, L., Sveen, U., & Roe, C. (2010). Disability, physical health and mental health 1 year after traumatic brain injury. *Disability and Rehabilitation, 32*, 1122-1131. doi: 10.3109/09638280903410722
- Andruszkow, H., Deniz, E., Urner, J., Probst, C., Grün, O., Lohse, R., . . . Hildebrand, F. (2014). Physical and psychological long-term outcome after traumatic brain injury in children and adult patients. *Health and Quality of Life Outcomes, 12*(1), 1-17. doi: 10.1186/1477-7525-12-26

- Arango-Lasprilla, J. C., Nicholls, E., Villasenor-Cabrera, T., Drew, A., Jimenez-Maldonado, M., & Martinez-Cortes, M. L. (2011). Health-related quality of life in caregivers of individuals with traumatic brain injury from Guadalajara, Mexico. *Journal of Rehabilitation Medicine*, *43*, 983-986. doi: 10.2340/16501977-0883
- Au, A., Lai, M. K., Lau, K. M., Pan, P. C., Lam, L., Thompson, L., & Gallagher-Thompson, D. (2009). Social support and well-being in dementia family caregivers: The mediating role of self-efficacy. *Aging and Mental Health*, *13*, 761-768. doi: 10.1080/13607860902918223
- Augusto, C. C., Araujo, B. R., Rodrigues, V. M., & de Figueiredo Mdo, C. (2014). Adaptation and validation of the inventory of family protective factors for the Portuguese culture. *Revista Latino-Americana de Enfermagem*, *22*, 1001-1008. doi: 10.1590/0104-1169.3315.2509
- Australian Institute of Health and Welfare [AIHW]. (2007). *Disability in Australia: Acquired brain injury*. Retrieved from AIHW: <http://www.aihw.gov.au/publication-detail/?id=6442468049>
- Bastawrous, M., Gignac, M. A., Kapral, M. K., & Cameron, J. I. (2015). Factors that contribute to adult children caregivers' well-being: A scoping review. *Health and Social Care in the Community*, *23*, 449-466. doi: 10.1111/hsc.12144
- Bayen, E., Pradat-Diehl, P., Jourdan, C., Ghout, I., Bosserelle, V., Azerad, S., . . . Steering Committee of the Pari, S. T. B. I.S. (2013). Predictors of informal care burden 1 year after a severe traumatic brain injury: Results from the Paris-TBI study. *Journal of Head Trauma Rehabilitation*, *28*, 408-418. doi: 10.1097/HTR.0b013e31825413cf
- Berg, B. v. d., Fiebig, D. G., & Hall, J. (2014). Well-being losses due to care-giving. *Journal of Health Economics*, *35*, 123-131. doi: 10.1016/j.jhealeco.2014.01.008
- Benedictus, M. R., Spikman, J. M., & Naalt, J. v. d. (2010). Cognitive and behavioral impairment in traumatic brain injury related to outcome and return to work. *Archives Physical Medicine Rehabilitation*, *91*, 1436-1441. doi: 10.1016/j.apmr.2010.06.019

- Ben-Zur, H., Duvdevany, I., & Lury, L. (2005). Associations of social support and hardiness with mental health among mothers of adult children with intellectual disability. *Journal of Intellectual Disability Research, 49*, 54-62.
- Bertella, L., Mori, I., Grugni, G., Pignatti, R., Ceriani, F., Molinari, E., . . . Semenza, C. (2007). Quality of life and psychological well-being in GH-treated, adult PWS patients: A longitudinal study. *Journal of Intellectual Disability Research, 51*, 302-311. doi: 10.1111/j.1365-2788.2006.00878.x
- Best, J. W. (1977). *Research in education* (3rd ed.). New Delhi: Prentice-Hall, INC.
- Boonyawat, S., & Sunsern, R. (2005). Factors influencing well-being of thalassemia children's caregivers at home in the eastern region. *The Journal of Faculty of Nursing Burapha University, 13*(1), 55-70.
- Bonsignore, M., Barkow, K., Jessen, F., & Heun, R. (2001). Validity of the five-item WHO Well-Being Index (WHO-5) in an elderly population. *European Archives of Psychiatry and Clinical Neuroscience, 251*, 1127-1131.
- Brain Injury Association of America [BIAA]. (2012). *About brain injury*. Retrieved from Brain Injury Association of America: <http://biausa.fyrian.com/about-brain-injury.htm>
- British Medical Journal [BMJ]. (2015). *Assessment of traumatic brain injury, acute*. Retrieved from BMJ Best Practice: <http://bestpractice.bmj.com/best-practice/monograph/515.html>
- Brummett, B. H., Morey, M. C., Boyle, S. H., & Mark, D. B. (2009). Prospective study of associations among positive emotion and functional status in older patients with coronary artery disease. *Journal of Gerontology: Psychological Sciences, 64*, 461-469. doi: 10.1093/geronb/gbp041
- Bureau of Non Communicable Diseases of Thailand. (2016). *Non communicable diseases information*. Retrieved from Bureau of Non Communicable Diseases, Ministry of Public Health, Thailand: <http://thaincd.com/2016/mission/documents.php?tid=32&gid=1-020&searchText=&pn=3>
- Butterworth, P., Pymont, C., Rodgers, B., Windsor, T. D., & Anstey, K. J. (2010). Factors that explain the poorer mental health of caregivers: Results from a community survey of older Australians. *Australian and New Zealand Journal of Psychiatry, 44*, 616-624.

- Carlozzi, N. E., Kratz, A. L., Sander, A. M., Chiaravalloti, N. D., Brickell, T. A., Lange, R. T., . . . Tulsy, D. S. (2015). Health-related quality of life in caregivers of individuals with traumatic brain injury: Development of a conceptual model. *Archives of Physical Medicine Rehabilitation, 96*, 105-113. doi: 10.1016/j.apmr.2014.08.021
- Carter, K. (2010). *African American caregiver resiliency: Resources, vulnerabilities, coping, and well-being among caregivers of persons with chronic illness* (Doctoral dissertation). Washington University, St. Louis.
- Centers for Disease Control and Prevention [CDC]. (2015). *Injury prevention & control: Traumatic brain injury*. Retrieved from Centers for Disease Control and Prevention: http://www.cdc.gov/traumaticbraininjury/get_the_facts.html
- Chaiyarit, A. (2012). *Perceived role strain in Thai family caregivers of heart failure patients* (Doctoral dissertation). Michigan State University, Michigan.
- Chansirimongkol, B. (2007). *Stress, coping, social support, and quality of life of family caregivers of persons with cancer receiving radiotherapy* (Master's thesis). Mahidol University, Bangkok.
- Charnsri, W. (2008). *Relationship of coping behaviors, social support and family well-being of family with stroke patients* (Master's thesis). Mahidol University, Bangkok.
- Chappell, N. L., & Reid, C. (2002). Burden and well-being among caregivers: Examining the distinction. *The Gerontologist, 42*, 772-780.
- Chen, J.-Y. (2004). *Functioning among Taiwanese families with a child having duchenne muscular dystrophy* (Doctoral dissertation). University of San Diego, San Diego.
- Chiewprasit, S. (2003). *The relationships among social support, hope, selected factors and well-being of head injury patients* (Master's thesis). Mahidol University, Bangkok.
- Clark, P. C. (2002). Effectes of individual and family hardiness on caregiver depression and fatigue. *Research in Nursing & Health, 25*(1), 37-48. doi: 10.1002/nur.10014
- Cobb, S. (1976). Social support as a moderator of life stress. *Psychosomatic Medicine, 38*, 300-314.

- Colantonio, A., Ratcliff, G., Chase, S., Kelsey, S., Escobar, M., & Vernich, L. (2004). Long term outcomes after moderate to severe traumatic brain injury. *Disability and Rehabilitation, 26*, 253-261. doi: 10.1080/09638280310001639722
- Coughlin, J. (2010). Estimating the impact of caregiving and employment on well-being. *Outcomes and Insights in Health Management, 2*(1), 1-7.
- Curry, P., Ramaiah, R., & Vavilala, M. S. (2011). Current trends and update on injury prevention. *International Journal of Critical Illness and Injury Science, 1*(1), 57-65. doi: 10.4103/2229-5151.79283
- Daonophakao, T. (2004). *Factors influencing the general well-being among the stroke patient caregivers in Chonburi province* (Master's thesis). Burapha University, Chonburi.
- Dean, P. J., & Sterr, A. (2013). Long-term effects of mild traumatic brain injury on cognitive performance. *Frontiers in Human Neuroscience, 7*, 1-11. doi: 10.3389/fnhum.2013.00030
- DeBaillie, A. M. (2014). *The effects of traumatic brain injury on families* (Master's thesis). Southern Illinois University Carbondale, Edwardsville.
- Degeneffe, C. E. (2001). Family caregiving and traumatic brain injury. *Health & Social Work, 26*, 257-268.
- Diener, E., Scollon, C. N., & Lucas, R. E. (2003). The evolving concept of subjective well-being: The multifaceted nature of happiness. *Advances in Cell Aging and Gerontology, 15*, 187-219. doi: 10.1016/s1566-3124(03)15007-9
- Diener, E., & Suh, E. (1997). Measuring quality of life: Economic, social, and subjective indicator. *Social Indicators Research, 40*, 189-216.
- Dillahunt-Aspillaga, C., Jorgensen-Smith, T., Ehlke, S., Sosinski, M., Monroe, D., & Thor, J. (2013). Traumatic brain injury: Unmet support needs of caregivers and families in Florida. *Plos One, 8*(12), 1-9. doi: 10.1371/journal.pone.0082896
- Dodge, R., Daly, A., Huyton, J., & Sanders, L. (2012). The challenge of defining wellbeing. *International Journal of Wellbeing, 2*, 222-235. doi: 10.5502/ijw.v2i3.4
- Driver, S., & Ede, A. (2009). Impact of physical activity on mood after TBI. *Brain Injury, 23*, 203-212. doi: 10.1080/02699050802695574

- Ennis, N., Rosenbloom, B. N., Canzian, S., & Topolovec-Vranic, J. (2013). Depression and anxiety in parent versus spouse caregivers of adult patients with traumatic brain injury: A systematic review. *Neuropsychological Rehabilitation, 23*(1), 1-18. doi: 10.1080/09602011.2012.712871
- Ergh, T. C., Hanks, R. A., Rapport, L. J., & Coleman, R. D. (2003). Social support moderates caregiver life satisfaction following traumatic brain injury. *Journal of Clinical & Experimental Neuropsychology, 25*, 1090-1101.
- Evans, L. D. (2011). *Caregiver burden in brain injury populations: An exploratory study* (Doctoral dissertation). Spalding University, Louisville, Kentucky.
- Ferrara, M., Langiano, E., Di Brango, T., De Vito, E., Di Cioccio, L., & Bauco, C. (2008). Prevalence of stress, anxiety and depression in with Alzheimer caregivers. *Health and Quality of Life Outcomes, 6*(1), 1-5. doi: 10.1186/1477-7525-6-93
- Forsberg-Warleyby, G., Iler, A. M., & Blomstrand, C. (2004). Psychological well-being of spouses of stroke patients during the first year after stroke. *Clinical Rehabilitation, 18*, 430-437. doi: 10.1191/0269215504cr740oa
- Franklin, C. P. (2003). *The effects of resiliency on adaptation of of African American caregivers of chronically ill elderly* (Doctoral dissertation). Louisiana State University Health Sciences Center, New Orleans.
- Gainer, R. B. (2015). *The graying of brain injury: Aging and lifespan issues*. Retrieved from Neurologic Rehabilitation Institute at Brookhaven Hospital: <http://www.traumaticbraininjury.net/>
- Gardner, D. L. (2007). *Family Resilience: The development of the inventory of family protective factors* (Doctoral dissertation). New Mexico State University, Las Cruces.
- Gholamzadeh, S., Hamid, T. A., Basri, H., Sharif, F., & Ibrahim, R. (2014). Religious coping and psychological well-being among Iranian stroke caregivers. *Iranian Journal of Nursing and Midwifery Research, 19*, 478-484.
- Glajchen, M. (2012). Physical well-being of oncology caregivers: An important quality-of-life domain. *Seminars in Oncology Nursing, 28*, 226-235. doi: 10.1016/j.soncn.2012.09.005

- Gliem, J. A., & Gliem, R. R. (2003). *Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales*. Paper presented at the the Midwest Research-to-Practice Conference in Adult, Continuing, and Community Education, The Ohio State University, Columbus.
- Godbolt, A. K., Stenberg, M., Jakobsson, J., Sorjonen, K., Krakau, K., Stainacke, B. M., & DeBoussard, C.N. (2015). Subacute complications during recovery from severe traumatic brain injury: Frequency and association with outcome. *British Medical Journal*, *5*(4), 1-9. doi: 10.1136/bmjopen-2014-007208
- Grant, J. S., Elliott, T. R., Weaver, M., Glandon, G. L., Raper, J. L., & Giger, J. N. (2006). Social support, social problem-solving abilities, and adjustment of family caregiver of stroke survivors. *Archives of Physical Medicine and Rehabilitation*, *87*, 343-350. doi: 10.1016/j.apmr.2005.09.019
- Grauwmeijer, E., Heijenbrok-Kal, M. H., Haitsma, I. K., & Ribbers, G. M. (2012). A prospective study on employment outcome 3 years after moderate to severe traumatic brain injury. *Archives Physical Medicine and Rehabilitation*, *93*, 993-999. doi: 10.1016/j.apmr.2012.01.018
- Greeff, A. P., & van der Walt, K.-J. (2010). Resilience in families with an autistic child. *Education and Training in Autism and Developmental Disabilities*, *45*, 347-355.
- Griffin, J.M., Friedemann-Sanchez, G., Jensen, A.C., Taylor, B.C., Gravely, A., Clothier, B., . . . & Ryn, V.M. (2012). The invisible side of war: Families caring for US service members with traumatic brain injuries and polytrauma. *Journal of Head Trauma Rehabilitation*. *27*(1), 3-13.
- Harris, G. J. (2009). *Caregiver well-being: Factors influencing positive outcomes in the informal caregiving process*. The Florida State University, College of Human Science, ProQuest LLC.
- Haugland, T. (2013). *Stress, social support, general self-efficacy and health related quality of life in patients with neuroendocrine tumors* (Doctoral dissertation). The University of Bergen, Norway.
- Heinlen, K. T. (2006). *A descriptive analysis of the clinical symptoms of caregivers for individuals with traumatic brain injury* (Doctoral dissertation). Cleveland State University, Ohio.

- Heitzmann, C. A., & Kaplan, R. M. (1988). Assessment of methods for measuring social support. *Health Psychology, 7*(1), 75-109.
- Henkle, E. J. (1994). *Hardiness, burden, stress, appraisal, coping and well-being of family caregivers of homebound older adults* (Doctoral dissertation). Indiana University, Bloomington.
- Herron, A. L. (2009). *Hardiness, cultural, values, and the mental health of non-paid primary caregivers of community-dwelling Alzheimer's patients* (Doctoral dissertation). Alliant International University, Los Angeles.
- Hilton, A., & Skrutskowski, M. (2002). Translating instruments into other language: Development and testing process. *Cancer Nursing, 25*(1), 1-7.
- Huang, C. F. (1996). *Families of children with developmental disabilities: The test of a structural model of family hardiness, social support, stress, coping, and family functioning* (Doctoral dissertation). Saint Louis University, St. Louis, Missouri.
- Huang, C.-Y., Sousa, V. D., Perng, S.-J., Hwang, M.-Y., Tsai, C.-C., Huang, M.-H., & Yao, S.-Y. (2009). Stressors, social support, depressive symptoms and general health status of Taiwanese caregivers of persons with stroke or Alzheimer's disease. *Journal of Clinical Nursing, 18*, 502-511. doi: 10.1111/j.1365-2702.2008.02443.x
- Huppert, F. A., & Baylis, N. (2004). Well-being: Towards an integration of psychology, neurobiology and social science. *Philosophical Transactions of the Royal Society B: Biological Sciences, 359*, 1447-1451. doi: 10.1098/rstb.2004.1520
- Imen, R. B., Olfa, C., Kamilia, C., Meriam, B., Hichem, K., Adel, C., . . . Nouredine, R. (2015). Factors predicting early outcome in patients admitted at emergency department with severe head trauma. *Journal of Acute Disease, 4*(1), 68-72. doi: 10.1016/s2221-6189(14)60087-1
- Institute of Medicine [IOM]. (2011). *Cognitive rehabilitation therapy for traumatic brain Injury: Evaluating the evidence*. Washington, DC: The National Academies Press.
- International Wellbeing Group. (2013). *Personal Wellbeing Index*. Melbourne: Australian.

- Ishikawa, F., Suzuki, S., Okumiya, A., & Shimizu, Y. (2011). Experiences of family members acting as primary caregivers for patients with traumatic brain injury. *Rehabilitation Nursing, 36*, 73-82.
- Jantarapat, C. (2015). *A model of psychological well-being of teachers residing in an area of unrest in Southern Thailand: A structural modeling study* (Doctoral dissertation). Prince of Songkla University, Hatyai.
- Jaroonsit, A. (2011). *Factors related to well-being of family caregivers of patients with stroke* (Master's thesis). Burapha University, Chonburi.
- Kaewsriwong, S. (2006). *Coping, and social support among traumatic brain injury patients' caregivers* (Master's thesis). Mahidol University, Bangkok.
- Kassaye, E. K. (2012). *Psychological well-being of spouse caregivers of dementia patients and their coping strategies* (Master's thesis). Arcada University, Helsinki.
- Kaufman, A. V., Kosberg, J. I., Leeper, J. D., & Tang, M. (2010). Social support, caregiver burden, and life satisfaction in a sample of rural African American and White caregivers of older persons with dementia. *Journal of Gerontological Social Work, 53*, 251-269. doi: 10.1080/01634370903478989
- Kelly, K. P., Wells, D. K., Chen, L., Reeves, E., Mass, E., Camitta, B., & Hinds, P. S. (2014). Caregiving demands and well-being in parents of children treated with outpatient or inpatient methotrexate infusion: A report from the children's oncology group. *Journal of Pediatric Hematology and Oncology, 36*, 495-500. doi: 10.1097/MPH.0b013e31828b0947
- Khiewchaum, R., Ngamkhum, S., & Kittithonrakun, M. (2013). The effects of using a clinical nursing guideline for caregivers' preparation in caring patients with traumatic brain injury. *Nursing Journal of the Ministry of Public Health, 23*(1), 15-29.
- Kim, H.-Y. (2013). Statistical notes for clinical researchers: Assessing normal distribution (2) using skewness and kurtosis. *Restorative Dentistry & Endodontics, 38*(1), 52-54. doi: 10.5395/rde.2013.38.1.52
- Koegelenberg, G. J. (2013). *Resilience characteristics of families with a child with type 1 diabetes* (Master's thesis). Stellenbosch University, Stellenbosch.

- Kolakowsky-Hayner, S. A., Wright, J., & Bellon, K. (2012). A brief overview of the Patient Competency Rating Scale: Updates and additions to the COMBI. *Journal of Head Trauma Rehabilitation, 27*(1), 83-85. doi: 10.1097/HTR.0b013e31823645db
- Kreutzer, J. S., Rapport, L. J., Marwitz, J. H., Harrison-Felix, C., Hart, T., Glenn, M., & Hammond, F. (2009). Caregivers' well-being after traumatic brain injury: A multicenter prospective investigation. *Archives of Physical Medicine and Rehabilitation, 90*, 939-946. doi: 10.1016/j.apmr.2009.01.010
- Laosanguanek, N., Wiroteurairuang, T., Siritho, S., & Prayoonwiwat, N. (2011). Reliability of the Thai version of SF-36 Questionnaire for an evaluation of quality of life in multiple sclerosis patients in multiple sclerosis clinic at Siriraj Hospital. *Journal of the Medical Association of Thailand, 94*(2), 84-88.
- Larew, C. F. (2006). *Perceived caregiving demands, family resiliency factors, and quality of life outcomes for family caregivers of traumatic brain injury victims during acute hospitalization* (Doctoral dissertation). University of Maryland, Baltimore.
- Lee, E. J., Jackson, B., Parker, V., DuBose, L., & Botchway, P. (2009). Influence of family resources and coping behaviors on well-being of African American and Caucasian parents of school-age children with asthma. *Association of Black Nursing Faculty Journal, 20*(1), 5-11.
- Lehan, T. J., Stevens, L. F., Arango-Lasprilla, J. C., Sosa, D. M. D., & Jove, I. G. E. (2012). Balancing act: The influence of adaptability and cohesion on satisfaction and communication in families facing TBI in Mexico. *NeuroRehabilitation, 30*(1), 75-86. doi: 10.3233/NRE-2012-0729
- Leske, J. S., & Jiricka, M. K. (1998). Impact of family demands and family strengths and capabilities on family well-being and adaptation after critical injury. *American Journal of Critical Care, 7*, 383-392.
- Leurmarnkul, W., & Meetam, P. (2005). Properties testing of the retranslated SF-36 (Thai version). *Thai Journal of Pharmaceutical Sciences, 29*(1), 69-88.
- Livingston, L. A., Kennedy, R. E., Marwitz, J. H., Arango-Lasprilla, J. C., Rapport, L. J., Bushnik, T., & Gary, K. W. (2010). Predictors of family caregivers' life satisfaction after traumatic brain injury at one and two years post-injury: A

- longitudinal multi-center investigation. *NeuroRehabilitation*, 27(1), 73-81.
doi: 10.3233/NRE-2010-0582
- Lu, M., Yang, G., Skora, E., Wang, G., Cai, Y., Sun, Q., & Li, W. (2015). Self-esteem, social support, and life satisfaction in Chinese parents of children with autism spectrum disorder. *Research in Autism Spectrum Disorders*, 17, 70-77.
doi: 10.1016/j.rasd.2015.05.003
- Lundin, A., de Boussard, C., Edman, G., & Borg, J. (2006). Symptoms and disability until 3 months after mild TBI. *Brain Injury*, 20, 799-806. doi: 10.1080/02699050600744327
- Machnicki, G., Allegri, R. F., Ranalli, C. G., Serrano, C. M., Dillon, C., Wyrwich, K. W., & Taragano, F. E. (2009). Validity and reliability of the SF-36 administered to caregivers of patients with alzheimer's disease: Evidence from a South American sample. *Dementia and Geriatric Cognitive Disorders*, 28, 206-212. doi: 10.1159/000236912
- Mahoney, R., Regan, C., Katona, C., & Livingston, G. (2005). Anxiety and depression in family caregivers of people with Alzheimer disease: the LASER-AD study. *American Journal of Geriatric Psychiatry*, 13, 795-801.
doi: 10.1176/appi.ajgp.13.9.795
- Man, D. W. K., Lam, C. S., & Bard, C. C. (2003). Development and application of the family empowerment questionnaire in brain injury. *Brain Injury*, 17, 437-450.
doi: 10.1080/0269905031000070152
- Manskow, U. S., Sigurdardottir, S., Roe, C., Andelic, N., Skandsen, T., Damsgard, E., . . . Anke, A. (2014). Factors affecting caregiver burden 1 year after severe traumatic brain injury: A prospective nationwide multicenter study. *Journal of Head Trauma Rehabilitation*, 30, 411-423. doi:
10.1097/HTR.0000000000000085
- Mark, S. (2008). *The relationship between hardiness, attachment Style, and well-being among college undergraduates* (Master's thesis). Roosevelt University, Chicago, Illinois.
- Mbugua, M. N., Kuria, M. W., & Ndeti, D. M. (2011). The Prevalence of depression among family caregivers of children with intellectual disability in a rural

- setting in Kenya. *International Journal of Family Medicine*, 2011, 1-5. doi: 10.1155/2011/534513
- McAllister, S., Derrett, S., Audas, R., & Paul, C. (2012). Well-being of carers of injured individuals from a prospective cohort study in New Zealand. *Australasian Epidemiologist*, 19(2), 22-26.
- McCubbin, H. I., Thompson, A. I., & McCubbin, M. A. (2001). *Family measures: Stress, coping and resiliency- inventories for research and practice*. Hawaii: Kamehameha Schools.
- McCubbin, M. A., & McCubbin, H. I. (2001). Resiliency in families: A conceptual model of family adjustment and adaptation in response to stress and crises. In H. I. McCubbin, A. I. Thompson, & M. A. McCubbin, *Family measures: Stress, coping and resiliency- inventories for research and practice* (pp. 1-145). Hawaii: Kamehameha Schools.
- McPherson, K. M., Pentland, B., & McNaughton, H. K. (2000). Brain injury - the perceived health of carers. *Disability and Rehabilitation*, 22, 683-689.
- Meecharoen, W., Sirapo-ngam, Y., Monkong, S., Oratai, P., & Northouse, L. L. (2013). Factors influencing quality of life among family caregivers of patient with advance cancer: A causal model. *Pacific Rim International Journal of Nursing Research*, 17, 304-316.
- Meesuk, W. (2005). *The factors predicting health status of caregivers of stroke patients* (Master's thesis). Mahidol University, Bangkok.
- Menon, D. K., Schwab, K., Wright, D. W., & Maas, A. I. (2010). Position statement: Definition of traumatic brain injury. *Archives of Physical Medicine and Rehabilitation*, 91, 1637-1640. doi: 10.1016/j.apmr.2010.05.017
- Mezher, A. A. A.-K. (2008). *Disability burden in traumatic brain injury in Gaza Strip* (Master's thesis). The Islamic University of Gaza Deanery of Higher Studies, Gaza.
- Mortazavi, F., Mousavi, S.-A., Chaman, R., & Khosravi, A. (2015). Validity of the World Health Organization-5 Well-Being Index: Assessment of maternal well-being and its associated factors. *Turkish Journal of Psychiatry*, 26(1), 48-55.

- Nabors, N., Seacat, J., & Rosenthal, M. (2002). Predictors of caregiver burden following traumatic brain injury. *Brain Injury, 16*, 1039-1050. doi: 10.1080/02699050210155285
- Narkthong, N. (2014). *The effect of the tailored discharge preparedness program on family caregiver's discharge readiness in caring for patients with traumatic brain injury* (Master's thesis). Prince of Songkhla University, Hatyai.
- National Alliance for Caregiving [NAC]. (2010). *Care for the family caregiver: A place to start*. New York: EmblemHealth.
- National Center for Chronic Disease Prevention and Health Promotion [NCDC]. (2013). *Well-being concept*. Retrieved from Center for Chronic Disease Prevention: <http://www.cdc.gov/hrqol/well-being.htm>
- National Institute of Neurological Disorders and Stroke [NINDS]. (2015). *NINDS traumatic brain injury information page*. Retrieved from National Institute of Neurological Disorders and Stroke: <http://www.ninds.nih.gov/disorders/tbi/tbi.htm>
- Neena L., C., & R. Colin, R. (2002). Burden and well-being among caregivers: Examining the distinction. *The Gerontologist, 42*, 772-780.
- Niyomthai, N., Putwatana, P., & Panpakdee, O. (2003). Caregiving duration, family life events, family hardiness, and well-being of family caregivers of stroke survivors. *Thai Journal of Nursing Research, 7*, 93-104.
- Noreuil, M. C. (2002). *Mothers with chronic illness and their spouse/partner: Uncertainty, family hardiness, and psychological wellbeing* (Doctoral dissertation). University of Wisconsin-Madison, Madison.
- Ondee, P., Panitrat, R., Pongthavornkamol, K., Senanarong, V., Harvath, T.A., & Nittayasudhi, D. (2013). Factors predicting depression among caregivers of persons with dementia. *Pacific Rim International Journal of Nursing Research, 17*: 167-180.
- Pallant, J. (2011). *SPSS survival manual: A step by step guide to data analysis using SPSS* (4th ed.). Australia: Allen & Unwin.
- Paneewat, S. (2008). *Validity of the Thai version of SF-36 for the evaluation of quality of life in heart failure patients compared with the New York Heart*

- Association Functional Classification* (Master's thesis). Mahidol University, Bangkok.
- Pangilinan, P. H., Kelly, B. M., & Hornyak, J. E. (2014). *Classification and complications of traumatic Brain Injury*. Retrieved from Medscape: <http://emedicine.medscape.com/article/326643-overview>
- Panpiemras, J., Puttitanun, T., Samphantharak, K., & Thampanishvong, K. (2011). Impact of Universal Health Care Coverage on patient demand for health care services in Thailand. *Health Policy*, *103*, 228-235. doi: 10.1016/j.healthpol.2011.08.008
- Pasquale, M. A., Pasquale, M. D., Baga, L., Eid, S., & Leske, J. (2010). Family presence during trauma resuscitation: Ready for primetime? *Journal of Trauma*, *69*, 1092-1099. doi: 10.1097/TA.0b013e3181e84222
- Pinto, P. E. (2008). *Impact of brain injury on caregiver outcomes and on family quality of life* (Doctoral dissertation). The State University of New York, New York.
- Plumb, J. C. (2011). *The impact of social support and family resilience on parental stress in families with a child diagnosed with an autism spectrum disorder* (Doctoral dissertation). University of Pennsylvania, Philadelphia.
- Polinder, S., Haagsma, J. A., van Klaveren, D., Steyerberg, E. W., & van Beeck, E. F. (2015). Health-related quality of life after TBI: A systematic review of study design, instruments, measurement properties, and outcome. *Population Health Metrics*, *13*, 1-12. doi: 10.1186/s12963-015-0037-1
- Polit, D. F., & Hungler, B. P. (1999). *Nursing research: Principles and methods* (6 ed.). Philadelphia: Lippincott Williams & Wilkins.
- Pongsitthisak, P. (2003). *Relationships between personal factors, objective burden, family hardiness, hope, and psychological well-being of schizophrenic patients' family caregivers in Jitavej Khonkhaen Rajanagarindra hospital* (Master's thesis). Chulalongkorn University, Bangkok.
- Potaya, S. (2001). *Model for family caregivers' participation in caring for traumatic brain injured patients* (Doctoral dissertation). Mahidol University, Bangkok.

- Poungbunhan, K. (1996). *Relationship among social support selected factors and fatigue in caregivers of head injured patients in recovery stage* (Master's thesis). Chiang Mai University, Chiang Mai.
- Prabripoo, T., Wongvatunyu, S., & Junhavat, D. (2013). Effects of the family caregiver supporting program on the ability and perception of the ability to care for traumatic brain Injury patients. *Royal Thai Air Force Medical Gazette*, 59(1), 42-49.
- Prombut, P., Piaseu, N., & Sakulhongsopon, S. (2014). Factors related to stress of family caregiver of patients with stroke at home. *Ramathibodi Nursing Journal*, 20(1), 82-96.
- Puasiri, S., Sitthimongkol, Y., Tilokskulchai, F., Sangon, S., & Nityasuddhi, D. (2011). Adaptation of Thai families with mentally ill young people. *Pacific Rim International Journal of Nursing Research*, 15, 137-151.
- Rabinowitz, A. R., & Levin, H. S. (2014). Cognitive sequelae of traumatic brain injury. *Psychiatric Clinics of North America*, 37(1), 1-11. doi: 10.1016/j.psc.2013.11.004
- Radhakrishna, R. B. (2007). Tips for developing and testing questionnaires/instruments. *Journal of Extension*, 45(1). Retrieved from Joe.org website: <http://www.joe.org/joe/2007february/tt2.php>
- Rafiyah, I. (2011). *Social support, coping, and burden of family caregivers caring for persons with schizophrenia in West Java province, Indonesia* (Master's thesis). Prince of Songkhla University, Hatyai.
- Raina, P., O'Donnell, M., Rosenbaum, P., Brehaut, J., Walter, S. D., Russell, D., . . . Wood, E. (2005). The health and well-being of caregivers of children with cerebral palsy. *Pediatrics*, 115, e626-e636. doi: 10.1542/peds.2004-1689
- Raj, E., Shiri, S., & Jangam, K. (2016). Subjective burden, psychological distress, and perceived social support among caregivers of persons with schizophrenia. *Indian Journal of Social Psychiatry*, 32(1), 42-49. doi: 10.4103/0971-9962.176767
- Rattanasuk, D., Nantachaipan, P., Sucamvang, K., & Moongtui, W. (2013). A causal model of well-being among caregivers of people with spinal cord injury. *Pacific Rim International Journal of Nursing Research*, 17, 342-355.

- Richardson, D. K. (2000). *The influence of support systems and internal system resources on family well-being of caregivers of a depressed family member* (Master's thesis). Grand Valley State University, Michigan.
- Riper, M. V. (2007). Families of children with Down syndrome: Responding to "a change in plans" with resilience. *Journal of Pediatric Nursing*, 22, 116-128. doi: 10.1016/j.pedn.2006.07.004
- Rose, W. J. (2012). *Caregiver health related quality of life and burden when caring for children with traumatic brain injury* (Master's thesis). University of Waikato, Hamilton.
- Rungreangkulkij, S. (2000). *Experience of Thai families of a person with schizophrenia: Family stress and adaptation* (Doctoral dissertation). University of California, San Francisco.
- Saipanish, R., Lotrakul, M., & Sumrithe, S. (2009). Reliability and validity of the Thai version of the WHO-Five Well-Being Index in primary care patients. *Psychiatry and Clinical Neurosciences*, 63, 141-146. doi: 10.1111/j.1440-1819.2009.01933.x
- Samartkit, N., Kasemkitvattana, S., Thosingha, O., & Vorapongsathorn, T. (2010). Caregiver role strain and rewards: Caring for Thais with a traumatic brain injury. *Pacific Rim International Journal of Nursing Research*, 14, 297-314.
- Sangsuwan, W. (2006). *Stress and well-being in mothers of preschool children with asthma in Thailand* (Doctoral dissertation). The University of Alabama at Birmingham, Birmingham.
- Sarkin, A. J., Groessl, E. J., Carlson, J. A., Tally, S. R., Kaplan, R. M., Sieber, W. J., & Ganiats, T. G. (2013). Development and validation of a mental health subscale from the Quality of Well-Being Self-Administered. *Quality of Life Research*, 22, 1685-1696. doi: 10.1007/s11136-012-0296-2
- Saunders, M. M. (2010). Working and caregiving: A comparison of employed and unemployed caregivers of older heart failure patients. *Holistic Nursing Practice*, 24(1), 16-22. doi: 10.1097/HNP.0b013e3181c8e469
- Savundranayagam, M. Y., Montgomery, R. J. V., & Kosloski, K. (2007). A dimensional analysis of caregiver burden among spouses and adult children. *The Gerontologist*, 51, 321-331. doi: 10.1093/geront/gnq102

- Schwarzbold, M., Diaz, A., Martins, E. T., Rufino, A., Amante, L. N., Thais, M. E., . . . Walz, R. (2008). Psychiatric disorders and traumatic brain injury. *Neuropsychiatric Disease and Treatment, 4*, 797-816.
- Sethabouppha, H., & Kane, C. (2005). Caring for the seriously mentally ill in Thailand: Buddhist family caregiving. *Archives of Psychiatric Nursing, 19*, 44-57.
- Sit, J. W., Wong, T. K., Clinton, M., Li, L. S., & Fong, Y.-m. (2004). Stroke care in the home: The impact of social support on the general health of family caregivers. *Journal of Clinical Nursing, 13*, 816-824.
- Snyder, K. A., & Pearse, W. (2010). Crisis, social support, and the family response: Exploring the narratives of young breast cancer survivors. *Journal of Psychosocial Oncology, 28*, 413-431. doi: 10.1080/07347332.2010.484830
- Spurlock, W. R. (2005). Spiritual well-being and caregiver burden in Alzheimer's caregivers. *Geriatric Nursing, 26*, 154-161. doi: 10.1016/j.gerinurse.2005.03.006
- Sung, C., Perrin, P. B., Mickens, M., Villaseñor-Cabrera, T., Jimenez-Maldonado, M., Martinez-Cortes, M. L., & Arango-Lasprilla, J. C. (2013). Influence of TBI impairments and related caregiver stress on family needs in Guadalajara, Mexico. *The Australian Journal of Rehabilitation Counselling, 19*, 100-118. doi: 10.1017/jrc.2013.14
- Sun, J., & Stewart, D. (2007). *Development of population based resilience measures in the primary school setting*. School of Public Health, Griffith University. Meadowbrook.
- Sustainable Development Research Network [SDRN]. (2007). *Wellbeing: Concepts and challenges discussion paper*. Retrieved from sd - research.org.uk: <http://www.sd-research.org.uk/research-and-resources/wellbeing-concepts-and-challenges-discussion-paper>
- Svavarsdottir, E. K., McCubbin, M. A., & Kane, J. H. (2000). Well-being of parents of young children with asthma. *Research Nurse Health, 23*, 346-358.
- Svavarsdottir, E. K., & Rayens, M. K. (2005). Hardiness in families of young children with asthma. *Journal of Advanced Nursing, 50*, 381-390.

- Tabish SA, & Syed, N. (2014). Recent advances and future trends in traumatic brain injury. *Emergency Medicine, 5*(1), 1-21. doi: 10.4172/2165-7548.1000229
- Tamtup, S. (2005). *Influences of perceived family hardness and caregiving duration of caregivers, and physical health and depression of patients, on subjective burden of caregivers of head and neck cancer patients receiving radiotherapy* (Master's thesis). Prince of Songkla University, Hatyai.
- Taylor, S. E., Sherman, D. K., Kim, H. S., Jarcho, J., Takagi, K., & Dunagan, M. S. (2004). Culture and social support: Who seeks it and why? *Journal of Personality and Social Psychology, 87*, 354-362. doi: 10.1037/0022-3514.87.3.354
- Techaatik, P., Wunsupon, S., & Sumritrin, S. (2011). Effectiveness of implementing evidence-based practice for traumatic patients at out patient of the accident and emergency unit. *Journal of Nursing Science & Health, 34*(3), 65-74.
- The Household Socio-economic Survey, National Statistical Office, Ministry of Information and Communication Technology. (2016). *The 2015 household socio-economic survey*. Retrieved from National statistic office: Ministry of information and communication technology: <http://web.nso.go.th/>
- Trevena, L., & Cameron, I. (2011). Traumatic brain injury: Long-term care of patients in general practice. *Australian Family Physician, 40*, 956-961.
- Trevittaya, P., & Wattanavittawat, P. (2016). Quality of life and perceived health status among people with spinal cord injury. *Bulletin of Chiang Mai Associated Medical Sciences, 49*, 185-196.
- Turner, B., Fleming, J., Parry, J., Vromans, M., Cornwell, P., Gordon, C., & Ownsworth, T. (2010). Caregivers of adults with traumatic brain injury: The emotional impact of transition from hospital to home. *Brain Impairment, 11*, 281-292. doi: 10.1375/brim.11.3.281
- Upadhyay, D. (2008). Cognitive functioning in TBI patients: A review of literature. *Middle-East Journal of Scientific Research, 3*, 120-125.
- Utriyaprasit, K., Bootcheewan, S., Chayaput, P., & Thosingha, O. (2012). The relationship between social support to caregiver and patient's disability caused by traumatic brain injury. *Siriraj Medical Journal, 64*, 188-192.

- VanBreda, A. D. (2001). *Resilience theory: A literature review with special chapter on deployment resilience in military families*. South Africa: South Africa Military Health Service.
- VanSoikema, J. M. (1997). *Stress, coping, adaptation, and family hardiness in families with an adult child who is developmental disabled and living in the parental home* (Master's thesis). Grand Valley State University, Michigan.
- Vipamaneeroj, T. (2002). *Effect of role preparation of spouse support on family member well-being in family with chronically ill child* (Master's thesis). Mahidol University, Bangkok.
- Weber, J. G. (2011). *Individual and family stress and crises*. Los Angeles: SAGE Publication, Inc.
- Weiss, J. A., Robinson, S., Fung, S., Tint, A., Chalmers, P., & Lunsky, Y. (2013). Family hardiness, social support, and self-efficacy in mothers of individuals with autism spectrum disorders. *Research in Autism Spectrum Disorders, 7*, 1310-1317. doi: 10.1016/j.rasd.2013.07.016
- Werner, S., & Shulman, C. (2013). Subjective well-being among family caregivers of individuals with developmental disabilities: The role of affiliate stigma and psychosocial moderating variables. *Research in Developmental Disabilities, 34*, 4103-4114. doi: 10.1016/j.ridd.2013.08.029
- Whitten, K. S. (2009). *Parents' perception of resiliency strengths, and resources in families of adolescents, with mild, moderate, and severe levels of depression* (Doctoral dissertation). Louisiana State University Health Sciences Center, New Orleans.
- Wise, E. K., Mathews-Dalton, C., Dikmen, S., Temkin, N., Machamer, J., Bell, K., & Powell, J. M. (2010). Impact of traumatic brain injury on participation in leisure activities. *Archives of Physical Medicine and Rehabilitation, 91*, 1357-1362. doi: 10.1016/j.apmr.2010.06.009
- Wonginchan, A. (2003). *Relationship between coping strategies and well-being of parents whose newborn infants were hospitalized in the neonatal intensive care unit* (Master's thesis). Mahidol University, Bangkok.

- Wongsa, S., Tongprasert, S., & Kovindha, A. (2011). Quality of life of primary caregivers of disabled people with spinal cord injury by using Short Form-36 Questionnaire. *Journal of Thai Rehabilitation Medicine, 21*(1), 28-33.
- Wongsawang, N., Lagampan, S., Lapvongwattana, P., & Bowers, B. J. (2013). Family caregiving for dependent older adults in Thai families. *Journal of Nursing Scholarship, 45*, 336-343. doi: 10.1111/jnu.12035
- Wu, S. F. (2014). Rapid screening of psychological well-being of patients with chronic illness: Reliability and validity test on WHO-5 and PHQ-9 scales. *Depress Research and Treatment, 2014*, 1-9. doi: 10.1155/2014/239490
- Yamashita, C. H., Amendola, F., Gaspar, J. C., Alvarenga, M. R., & Oliveira, M. A. (2013). Association between social support and the profiles of family caregivers of patients with disability and dependence. *The University of Sao Paulo Nursing School Journal, 47*, 1359-1364. doi: 10.1590/S0080-623420130000600016
- Yiengprugsawan, V., Seubsman, S. A., & Sleight, A. C. (2012). Psychological distress and mental health of Thai caregivers. *Psychology of Well-Being: Theory, Research and Practice, 2*, 1-11. doi: 10.1186/2211-1522-2-4
- Yousefzade-Chabok, S., Kapourchali, S. R., Reihanian, Z., Leili, E. K., Moghadam, A. D., & Amiri, Z. M. (2014). Predictors of chronic physical and mental quality of life following traumatic brain injury. *Health, 6*, 496-503. doi: 10.4236/health.2014.66069
- Zumstein, M. A., Moser, M., Mottini, M., Ott, S. R., Sadowski-Cron, C., Radanov, B. P., . . . Exadaktylos, A. (2011). Long-term outcome in patients with mild traumatic brain injury: A prospective observational study. *Journal of Trauma, 71*(1), 120-127. doi: 10.1097/TA.0b013e3181f2d670

APPENDICES

APPENDIX A

Information and Informed Consent

Dear Participants in this study

My name is Orachorn Lumprom, I am a Master of Nursing Science Student of the Faculty of Nursing, Prince of Songkla University, Thailand. Now, I am conducting a study “Predictive Factors of Thai Traumatic Brain Injury (TBI) Family Caregivers’ Well-being”. This will be fulfilling the requirement of the Master of Nursing Science Program at Prince of Songkla University. So I would like to invite you to participate as a volunteer in this research study as well as clarify the following:

Purpose and Benefit:

The purposes of this study are to describe TBI family caregivers’ well-being and to examine the predicting power of factors which are family hardiness and social support on family caregivers’ well-being. The information from you will be used to write the study findings and these findings are the basis data for developing nursing practice to promote caring for a family member post TBI and family caregiver’s well-being.

Procedures:

The procedures of this study have been approved by the Institutional Review Board of Faculty of Nursing, Prince of Songkla University, Hadyai Hospital, and Maharaj Nakhon Si Thammarat Hospital in Thailand. The researcher or research assistant will meet the family caregiver of the TBI person at the Neurosurgical Outpatient Department of the hospital. An appointment can be made to meet the researcher at a place that is private or convenient for the family caregiver. After that, you will be asked to answer the questions by filling in the questionnaires. The questionnaires consist of (1) the TBI Person and Family Caregiver Demographic Data Form, (2) Family Hardiness Index, (3) Social Support Index, and (4) Family Member Well-being Index. The approximate time to answer these questions will take around

40 to 60 minutes. While responding to the questionnaires or interview, you can refuse to answer any questions or you can ask the researcher to clarify anything that may be unclear and you can ask to terminate the conversation at any time.

Risks/Discomforts:

Completing the questionnaires may be interrupting the time of your daily activities or may make you tired. So, you have a right to refuse to participate in research or to ask to stop your participation after joining without notice. Refusal to participate in the survey will not affect the service or treatment that you receive at all. If you need any other help, the researcher will coordinate with relevant agencies to help you and if the researcher has more information about this research, the researcher will inform you as soon as possible and will not hide anything from you.

Confidentiality:

All of the information from you will remain confidential and the researcher will not release it to unauthorized personnel without your consent except as required by law. The data records will not reveal your name and if the results of this study are written in a scientific journal or presented at a scientific meeting, it will not include any personal identifiers. Only the researcher and administrators of this research can read your answers. The questions will be destroyed after the completion of this research and you have the right to request verification of the data at any time.

Finally, you can review the questionnaires and this consent form for your understanding and to help you decide. If you have any questions at any time during the study, please feel free to contact me or my advisor by any of the following; Miss Orachorn Lumprom, call: 098-6831083, e-mail: Orachorn.lu@gmail.com and Assistant Professor Dr.Luppana Kitrungrrote, Department of Surgical Nursing, Faculty of Nursing, Prince of Songkla University, call: 089-6478910, e-mail: luppana.k@psu.ac.th

Statement of Your Consent:

I have read the above description of this research study. I have been informed of the risks and benefits involved, and all my questions have been answered to my satisfaction. I have been assured that any future questions I may have will also be answered by a member of the research team. I voluntarily agree to take part in this study. I understand that I will receive a copy of this consent form.

Signature _____

Signature _____

(_____)

(Miss Orachorn Lumprom)

Participant

Researcher

Date ____ / ____ / _____

Date ____ / ____ / _____

APPENDIX B

Information and Informed Consent (Thai version)

เรียน ผู้เข้าร่วมการวิจัยทุกท่าน

ดิฉัน นางสาวอรชร หล้าพรหม เป็นนักศึกษาปริญญาโท สาขาการพยาบาล (นานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์ ขณะนี้กำลังศึกษาวิจัยเรื่อง “ปัจจัยทำนายความผาสุกของญาติผู้ดูแลผู้ป่วยบาดเจ็บศีรษะในประเทศไทย” วิจัยนี้เป็นวัตถุประสงค์หนึ่งในการศึกษาหลักสูตรพยาบาลศาสตรมหาบัณฑิต ดิฉันจึงใคร่ขอเชิญท่านเป็นอาสาสมัครเข้าร่วมการวิจัยนี้ โดยรายละเอียดของการวิจัยมีดังนี้

วัตถุประสงค์และประโยชน์ของการวิจัย

วัตถุประสงค์ของการวิจัย คือ เพื่อที่จะศึกษาความผาสุกของญาติผู้ดูแลผู้ป่วยบาดเจ็บศีรษะภายหลังจำหน่ายผู้ป่วยออกจากโรงพยาบาล และผลของความเข้มแข็งภายในครอบครัวและการสนับสนุนทางสังคมต่อความผาสุกของท่าน ข้อมูลที่ได้จากท่านจะนำไปใช้ในการรายงานผลการวิจัย หรือเป็นข้อมูลพื้นฐานในการพัฒนาการพยาบาล เพื่อส่งเสริมการดูแลสมาชิกที่บาดเจ็บศีรษะและความผาสุกของญาติผู้ดูแล

ขั้นตอนการเก็บข้อมูลวิจัย

การวิจัยนี้ได้ผ่านการตรวจสอบด้านจริยธรรมการวิจัยโดยคณะกรรมการจริยธรรมการวิจัยในมนุษย์ของคณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์ โรงพยาบาลหาดใหญ่ และโรงพยาบาลมหาราชนครศรีธรรมราช เป็นที่เรียบร้อยแล้ว โดยดิฉันหรือผู้ช่วยวิจัยจะพบท่านที่คลินิกผู้ป่วยนอกด้านศัลยกรรมประสาทของโรงพยาบาลและจะนัดหมายท่านตามวัน เวลา และสถานที่ที่ท่านสะดวกหรือมีความเป็นส่วนตัว เพื่อขอความร่วมมือให้ท่านตอบแบบสอบถาม ซึ่งมีทั้งหมด 5 ส่วน คือ (1) แบบสอบถามข้อมูลส่วนบุคคลของญาติผู้ดูแลและผู้ป่วย (2) แบบสอบถามความเข้มแข็งของครอบครัว (3) แบบสอบถามการสนับสนุนทางสังคม และ (4) แบบสอบถามความผาสุกของญาติผู้ดูแล ระยะเวลาที่ใช้ในการตอบแบบสอบถามประมาณ 40 - 60 นาที ระหว่างที่ท่าน

ตอบแบบสอบถามนั้น ท่านสามารถปฏิเสธการตอบคำถามหรือหยุดการสนทนาได้ไม่ว่าเวลาใดก็ตาม และสามารถขอคำอธิบายหรือคำชี้แจงในส่วนที่ไม่ชัดเจน

ความเสี่ยง/ความไม่สบายใจจากการเข้าร่วมการวิจัย

การตอบคำถามทั้งหมดนี้ อาจรบกวนเวลาของท่านในการทำภารกิจประจำวันหรือท่านอาจรู้สึกเหนื่อยล้าที่จะตอบคำถาม ดังนั้นท่านมีสิทธิ์ที่จะปฏิเสธการเข้าร่วมวิจัยหรือหยุดการเข้าร่วมภายหลังจากที่ท่านเข้าร่วมการวิจัยไปแล้ว โดยไม่ต้องแจ้งให้ทราบ การปฏิเสธนี้จะไม่มีผลใดๆต่อการรับบริการหรือการรักษาทางการแพทย์ หากท่านต้องการความช่วยเหลืออื่นใดที่เกี่ยวข้องกับการวิจัย ดิฉันจะประสานงานไปยังหน่วยงานที่เกี่ยวข้อง และหากดิฉันมีข้อมูลเพิ่มเติมของการวิจัยนี้ ดิฉันจะแจ้งให้ท่านทราบในทันทีโดยไม่มีการปกปิดใดๆ

การรักษาความลับ/การปกปิดข้อมูล

ข้อมูลที่ได้จากท่านจะถูกเก็บเป็นความลับ โดยไม่เปิดเผยให้แก่บุคคลใดหากมิได้รับอนุญาตจากท่าน เว้นแต่จะเป็นการร้องขอตามกฎหมาย ทั้งนี้การบันทึกข้อมูล การตีพิมพ์ผลงานวิจัย และหรือการนำเสนอทางวิชาการจะไม่มีการระบุตัวตนของท่าน โดยจะมีเพียงผู้วิจัยและผู้จัดการข้อมูลการวิจัยเท่านั้นที่สามารถเข้าถึงคำตอบของท่าน แบบสอบถามทั้งหมดจะถูกทำลายภายหลังเสร็จสิ้นการวิจัยนี้และท่านมีสิทธิ์ที่จะตรวจสอบข้อมูลได้ตลอดเวลา

สุดท้ายนี้ ท่านสามารถอ่านทำความเข้าใจแบบสอบถามและเอกสารแสดงความยินยอมการเข้าร่วมการวิจัยนี้ เพื่อช่วยในการตัดสินใจ หากท่านมีคำถามหรือข้อสงสัยใดๆ ท่านสามารถติดต่อสอบถามดิฉันได้โดยตรงทางโทรศัพท์: 098-6831083 อีเมล: Orachorn.lu@gmail.com หรือติดต่อที่ปรึกษาวิจัย คือ ผู้ช่วยศาสตราจารย์ ดร. ลัพพณา กิจรุ่งโรจน์ โทร: 089-6478910 อีเมล: luppana.k@psu.ac.th

ข้อความแสดงความยินยอมของท่าน

ข้าพเจ้าได้อ่านรายละเอียดของงานวิจัยนี้และเข้าใจข้อความทั้งหมดแล้ว ข้าพเจ้ารับทราบถึงความเสี่ยงและประโยชน์ของการเข้าร่วมการวิจัย โดยข้าพเจ้าพึงพอใจต่อคำตอบที่ได้รับและ

ข้าพเจ้ายังได้รับความมั่นใจว่า หากข้าพเจ้ามีข้อสงสัยประการใดจะสามารถทราบคำตอบจากทีมผู้วิจัยได้ ข้าพเจ้าจึงมีความสมัครใจที่จะเข้าร่วมการวิจัยในครั้งนี้ และได้รับเอกสารยินยอมฉบับนี้ไว้

ลงชื่อ _____ ผู้เข้าร่วม ลงชื่อ _____ ผู้วิจัย

(_____)

(น.ส. อรชร หล้าพรม)

____ / ____ / _____

____ / ____ / _____

(วัน / เดือน / ปี)

(วัน / เดือน / ปี)

APPENDIX C

Code:
Date:

Demographic Form of Caregiver

Direction: Please answer all of the following questions about yourself and your family by placing ✓ in that applies to you or by filling in the answer in the blank space.

1. Age: _____ years old
2. Gender: Male Female
3. Marital Status: Single Married Divorced/Widowed Separated
4. Religion: Buddhist Islamic Christian
 Other, please specify _____
5. Highest level of education:
 - No education Elementary Education High School
 - Vocational School Bachelor Degree/Higher
6. Current occupation:
 - No occupation Farmer Employee Government officer
 - Business Retired Other, please specify _____
-
-
-
16. Have you ever had training as a caregiver of TBI person before discharge?
 - No Yes, please specify the kind of training _____
17. Your address _____
18. Your telephone number _____

APPENDIX D

Code:
Date:

Demographic Form of TBI Person

Direction part I: Please answer the following questions regarding your TBI person under your care by placing ✓ in that applies to you or by filling in the answer in the blank space (Questions No. 1-11).

1. Age: _____ years old
2. Gender: Male Female
3. Marital Status: Single Married Divorced/Widowed Separated
4. Religion: Buddhist Islamic Christian
 Other, please specify _____
5. Highest level of education:
 No education Elementary Education High School
 Vocational School Bachelor Degree/Higher
6. Occupation at present:
 No occupation Farmer Employee Government Official
 Business Retired Other, please specify _____
-
-
-
13. Type of brain injury at admission _____
14. Severity of brain injury at admission:
 Moderate Severe
15. Current Glasgow Coma Score (GCS) at present: _____

APPENDIX E

Code:
Date:

Family Hardiness Index (FHI)

Direction: Please read each statement below and decide to what degree each describes your family. Is the statement False (0), Mostly False (1), Mostly True (2), or True (3) about your family? Circle a number 0 to 3 to match your feeling about each statement. Please respond to each and every statement.

Statement	False	Mostly False	Mostly True	True
1. Trouble results from mistakes we make	0	1	2	3
2. It is not wise to plan ahead and hope because things do not turn out any way	0	1	2	3
3. Our work and efforts are not appreciated no matter how hard we try and work	0	1	2	3
4. In the long run, the bad things that happen to us are balanced by the good things that happen	0	1	2	3
5. We have a sense of being strong even when we face big problems	0	1	2	3
•				
•				
•				
18. We work together to solve the problem	0	1	2	3
19. Most of the unhappy things that happen are due to bad luck	0	1	2	3
20. We realize our lives are controlled by accidents and luck	0	1	2	3

Total score _____

APPENDIX F

Code:
Date:

Social Support Index (SSI)

Direction: Read the statement below and decide for your family whether you: (0) Strongly Disagree; (1) Slightly Agree; (2) Moderately Agree; or (3) Strongly Agree.

- | | |
|---|---|
| 1. If I had an emergency, even people I do not know in this community would be willing to help. | <input type="checkbox"/> Strongly Disagree
<input type="checkbox"/> Slightly Agree
<input type="checkbox"/> Moderately Agree
<input type="checkbox"/> Strongly Agree |
| 2. People here know they can get help from the community if they are in trouble. | <input type="checkbox"/> Strongly Disagree
<input type="checkbox"/> Slightly Agree
<input type="checkbox"/> Moderately Agree
<input type="checkbox"/> Strongly Agree |
| 3. I have friends who let me know they value who I am and what I can do. | <input type="checkbox"/> Strongly Disagree
<input type="checkbox"/> Slightly Agree
<input type="checkbox"/> Moderately Agree
<input type="checkbox"/> Strongly Agree |
| • | |
| • | |
| • | |
| 12. This community has social welfare or organizations to help the members | <input type="checkbox"/> Strongly Disagree
<input type="checkbox"/> Slightly Agree
<input type="checkbox"/> Moderately Agree
<input type="checkbox"/> Strongly Agree |
| 13. My family and I get support from our neighbor. | <input type="checkbox"/> Strongly Disagree
<input type="checkbox"/> Slightly Agree
<input type="checkbox"/> Moderately Agree
<input type="checkbox"/> Strongly Agree |
| 14. Health care providers visit my family and give suggestions for how my family can take care of the ill member. | <input type="checkbox"/> Strongly Disagree
<input type="checkbox"/> Slightly Agree
<input type="checkbox"/> Moderately Agree
<input type="checkbox"/> Strongly Agree |

Total score _____

APPENDIX G

Code:
Date:

Family Member Well-being Index (FMWB)

Direction: The eight statements are feelings about your well-being. Each end of the 0 to 10 scale describes opposite feelings. Please note; circle a number along the bar which seems closest to how you have generally felt during the past month.

Example											
Not concerned at all	0	1	2	3	4	5	6	7	8	9	Very concerned 10
No. 10 indicates you have been very concerned											
1. How concerned or worried about your health have you been? (During the past month)											
Not concerned at all	0	1	2	3	4	5	6	7	8	9	Very concerned 10
2. How relaxed or tense have you been? (During the past month)											
Very relaxed	0	1	2	3	4	5	6	7	8	9	Very tense 10
•											
•											
•											
8. How concerned or worried about the health of another family member have you been? (during the past month)											
Not concerned at all	0	1	2	3	4	5	6	7	8	9	Very concerned 10

Total score _____

APPENDIX H

Instrument Permissions

Part I: Permission for using the Functional Independence Measure and Functional Assessment Measure (FIM+FAM)

From: Orachorn Lumprom <orachorn.lu@gmail.com>

To: jerry.wright@hhs.sccgov.org

Sent: Mon, Nov 16, 2015 at 5.43 PM

Subject: Obtaining permission for Instrument

Dear Director of Santa Clara Valley Medical Center (SCVMC), San Jose, California

My name is Orachorn Lumprom, I am a Master's Student of Nursing International Program, Faculty of Nursing, Prince of Songkla University, Thailand. I am developing the thesis entitled "Predictive Factors of Thai Traumatic Brain Injury (TBI) Family Caregivers' Well-being". My major adviser is Assistant Professor Dr. Luppana Kitrungrrote, Department of Surgical Nursing, Faculty of Nursing, Prince of Songkla University, Thailand. I am interested in your instrument that is Functional Independence Measure + Functional Assessment Measure (FIM+FAM) and this instrument was found to be reliable with the good reliability value. In addition, it is consistent with the concept of functional status of my study. Therefore, I would like to ask your permission to use FIM+FAM and translate it into Thai version in this study.

Thank you for your attention and kind consideration. I am looking forward to hearing from you.

Best Regards,

Orachorn Lumprom

Master of Nursing Student, Faculty of Nursing, PSU, Thailand

From: Wright, Jerry <Jerry.Wright@hhs.sccgov.org>

To: Orachorn Lumprom <orachorn.lu@gmail.com>

Sent: Mon, Nov 16, 2015 at 11.53 PM

Subject: RE: Obtaining permission for Instrument

Hello Orachorn,

Please feel free to use the FIM+FAM measure. It is in the public domain. If you do both a forward and backward translation of the instrument, please consider allowing us to feature it on the COMBI website (www.tbims.org/combi).

Good luck with your project.

Best,

Jerry

Jerry Wright
Director, Research Administration
Santa Clara Valley Medical Center
408 793-2098

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Part II: Permission for using the Family Hardiness Index (FHI) and Family Member Well-Being Index (FMWB)



บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล

๒๕/๒๕ ต.พุทธมนตลสาย ๔ ศาลายา นครปฐม ๗๓๑๓๐

โทร. ๐-๒๕๔๔-๓๓๓๒๕๒ ต่อ ๓๐๙-๓๑๑ โทรสาร ๐-๒๕๔๔-๓๑๑๔

ที่ ศธ ๐๕๑๓.๑๐ / ๐๐๓๖๑๖
วันที่ ๒๕ มกราคม ๒๕๕๘
เรื่อง อนุญาตให้ใช้เครื่องมือวิจัย

เรียน คณะบดีคณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์

อ้างถึง หนังสือที่ ศธ ๐๕๑๓.๑.๐๕/๓๒๗๒ ลงวันที่ ๑๙ พฤศจิกายน ๒๕๕๘

ตามหนังสือที่อ้างถึง คณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์ แจ้งว่า

ผู้ขอใช้เครื่องมือวิจัย : นางสาวอรชร หล้าพรหม นักศึกษาหลักสูตรพยาบาลศาสตรมหาบัณฑิต (นานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์

งานวิจัยของผู้ขอใช้เครื่องมือ : "PREDICTIVE FACTORS OF THAI TBI FAMILY CAREGIVERS' WELL-BEING" โดยมี ผศ.ดร.กัณฑ์ กิจรุ่งโรจน์ เป็นอาจารย์ที่ปรึกษาวิทยานิพนธ์

เครื่องมือวิจัยที่ขอใช้ : Family Hardiness Index (FHI) และ Family Member Well-being index (FMWB)

เครื่องมือวิจัยนี้พัฒนาโดย : นางสาวนิภา นิยมไพบ เป็นส่วนหนึ่งของวิทยานิพนธ์หลักสูตรพยาบาลศาสตรมหาบัณฑิต สาขาวิชาการพยาบาลผู้ใหญ่ คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี พ.ศ. ๒๕๔๕ เรื่อง "CAREGIVING DURATION, FAMILY LIFE EVENTS, FAMILY HARDINESS, AND WELL-BEING OF FAMILY CAREGIVERS OF STROKE SURVIVORS." ซึ่งมี รศ.ดร.พรพนวดี หุอรุณณะ เป็นอาจารย์ที่ปรึกษาวิทยานิพนธ์หลัก

บัณฑิตวิทยาลัย และโรงเรียนพยาบาลรามาธิบดี คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี ได้พิจารณาแล้ว ไม่ขัดข้อง ยินดีอนุญาตให้ นางสาวอรชร หล้าพรหม ใช้เครื่องมือวิจัยดังกล่าวได้ เนื่องจากเป็นการศึกษาวิจัยทางด้านวิชาการ แต่ทั้งนี้ขอได้โปรดระบุให้ชัดเจนด้วยว่าเครื่องมือวิจัยดังกล่าวมาจากวิทยานิพนธ์ของนักศึกษาบัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล และมีอาจารย์ท่านใดทำหน้าที่อาจารย์ที่ปรึกษาวิทยานิพนธ์หลัก และต้องปฏิบัติตามระเบียบการขอใช้เครื่องมือวิจัยของหลักสูตรพยาบาลศาสตรมหาบัณฑิต โรงเรียนพยาบาลรามาธิบดี คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี ซึ่งกำหนดให้ผู้ขออนุญาตใช้เครื่องมือวิจัยต้องดำเนินการตามระเบียบการขอใช้เครื่องมือวิจัย (ตามแบบฟอร์มที่แนบมาพร้อมนี้) และต้องชำระค่าบริการการขอใช้เครื่องมือ จำนวน ๒๐๐บาท (สองร้อยบาทถ้วน) ต่อเครื่องมือวิจัย ๑ ฉบับ โดยโอน

...../๒.

-๒ -

เงินเข้าบัญชีธนาคารไทยพาณิชย์ จำกัด (มหาชน) สาขารามอินทรี ชื่อบัญชี "หลักสูตรการศึกษาระดับปริญญาโทรามอินทรี" เลขที่บัญชี ๐๒๖-๕-๓๕๕๘๘๓๗ ประเภทออมทรัพย์ และแนบหลักฐานการโอนเงินมาพร้อมกับการกรอกแบบ บทร. ๓๕ บทร.๓๖ ส่งมาที่...

หลักสูตรพยาบาลศาสตรมหาบัณฑิต โรงเรียนพยาบาลรามอินทรี
คณะแพทยศาสตร์โรงพยาบาลรามอินทรี มหาวิทยาลัยมหิดล
๒๓๐ ถนนพระรามที่ ๖ เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐
โทร. ๐-๒๒๐๑-๒๐๓๘ โทรสาร ๐-๒๒๐๑-๕๖๓๓

จึงเรียนมาเพื่อโปรดทราบ และดำเนินการต่อไปด้วย จักขอบพระคุณยิ่ง

ขอแสดงความนับถือ



(รองศาสตราจารย์ ดร. วราภรณ์ อัครปทุมวงศ์)

รองคณบดีฝ่ายวิชาการ

ปฏิบัติงานแทน คณบดีบัณฑิตวิทยาลัย

Part III: Permission for using the Social Support Index (SSI)

ที่ ศธ 0514.6.1.1.1/114


 คณะพยาบาลศาสตร์ มหาวิทยาลัยขอนแก่น
 อำเภอเมือง จังหวัดขอนแก่น 40002

คณะพยาบาลศาสตร์
เลขที่..... 127
วันที่ 18 ม.ค. 59
เวลา..... 15-00

11 มกราคม 2559

เรื่อง อนุญาตให้ใช้เครื่องมือวิจัยของบุคลากรในสังกัด

เรียน คณบดีคณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์

อ้างถึง หนังสือ ศธ 0521.1.05/0004 ลงวันที่ 4 มกราคม 2559

ตามที่ นางสาวอรชร หล้าพรหม นักศึกษาหลักสูตรพยาบาลศาสตรมหาบัณฑิต (นานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์ กำลังดำเนินการทำวิทยานิพนธ์ เรื่อง "Predictive Factors of Thai TBI Family Caregivers 'Well-being'" ในการนี้นักศึกษามีความประสงค์ที่จะขอใช้เครื่องมือการวิจัย คือ แบบสำรวจการได้รับความสนับสนุนจากชุมชน (Social Support Index) ของ รองศาสตราจารย์ ดร.สมพร รุ่งเรืองกลกิจ ความละเอียดดังแจ้งแล้ว นั้น

คณะพยาบาลศาสตร์ มหาวิทยาลัยขอนแก่น พิจารณาแล้ว ไม่ขัดข้อง และใคร่ขอเรียนให้ทราบว่า รองศาสตราจารย์ ดร.สมพร รุ่งเรืองกลกิจ ยินดีอนุญาตให้ใช้เครื่องมือวิจัยดังกล่าว ได้

จึงเรียนมาเพื่อโปรดทราบ

ขอแสดงความนับถือ

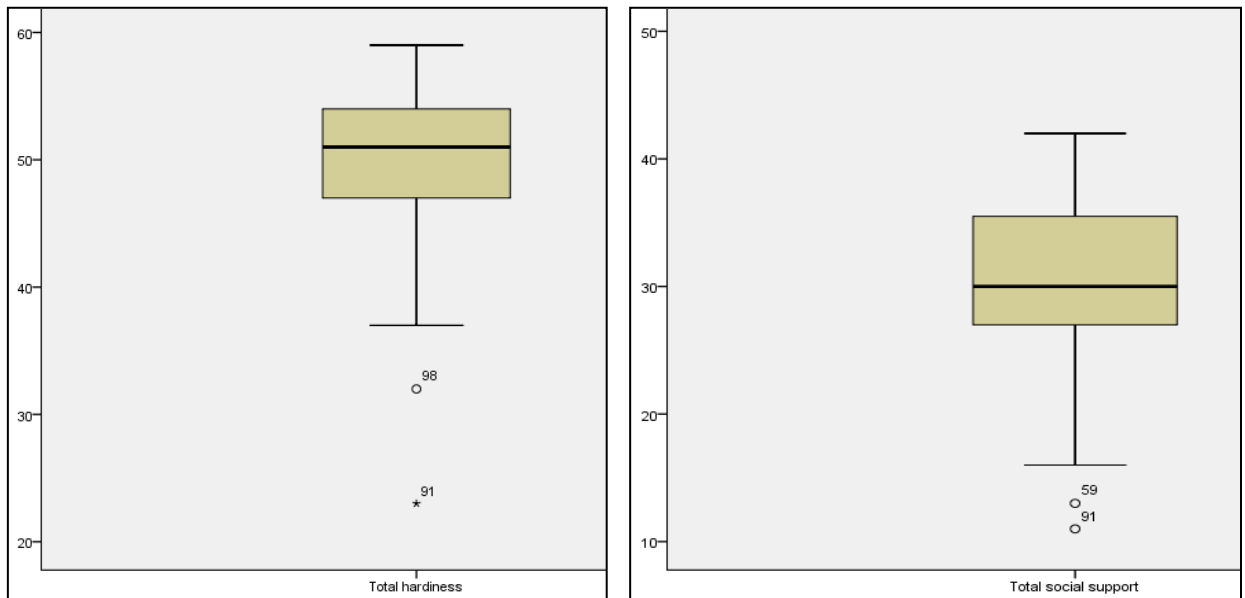
 (ผู้ช่วยศาสตราจารย์ ดร.เสาวมาศ คุณล้าน เลื่อนมาดี)
 คณบดีคณะพยาบาลศาสตร์

APPENDIX I

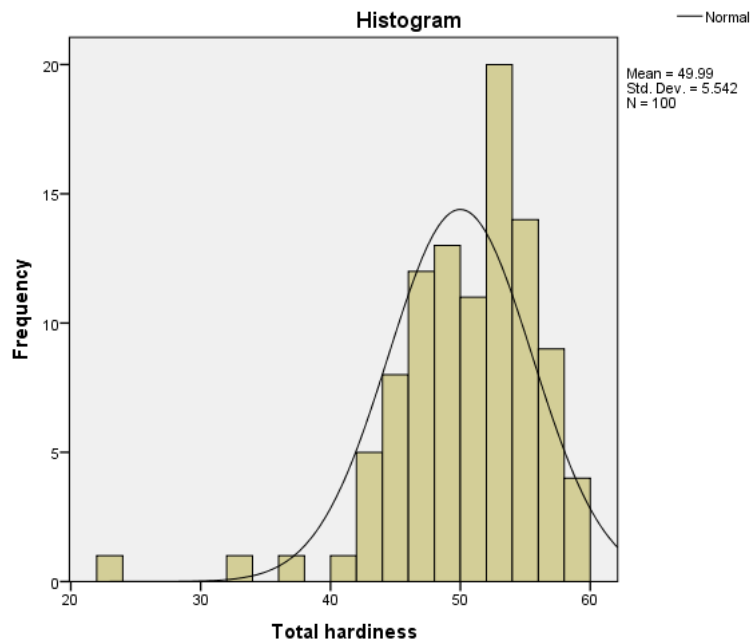
Assumptions Test Procedures

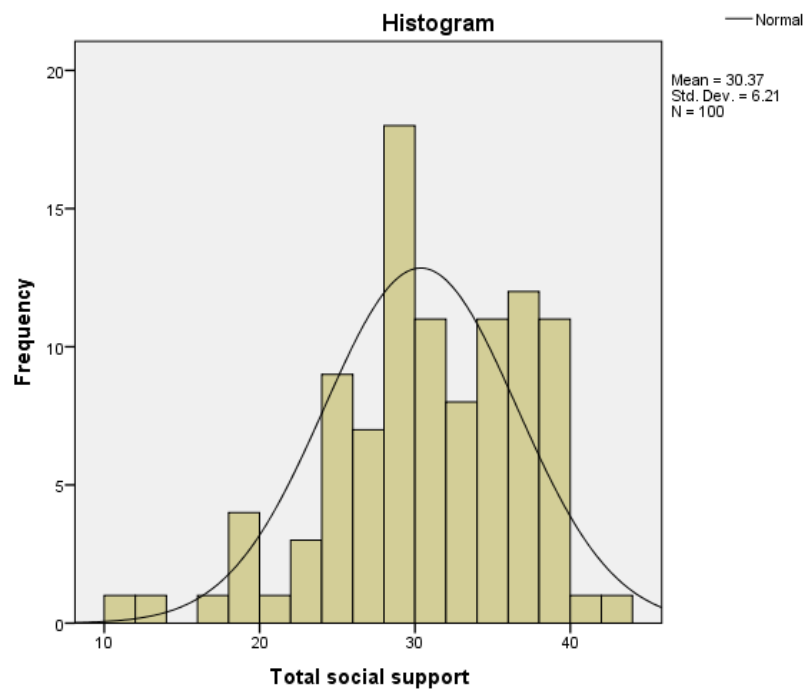
There were some outliers and abnormal distributions of family hardiness and social support in the data set of 100 family caregivers as shown in the following:

1. Box-plot of family hardiness and social support scores



2. Histogram of family hardiness and social support scores





3. Standardized Skewness and Kurtosis of family hardiness, social support, and family caregivers' well-being.

Skewness formula: $Z = \text{Skew value} / SE_{\text{skewness}}$

Kurtosis formula: $Z = \text{Excess kurtosis} / SE_{\text{excess kurtosis}}$

An acceptable critical value for skewness and kurtosis was at ≤ 3.29 and it indicated a normality of distribution (Kim, 2013).

Variables	Skewness	Kurtosis
Family hardiness	-6.53	10.99
Social support	2.58	0.80
Family caregivers' well-being	-0.53	-0.81

Outlier detection and removal

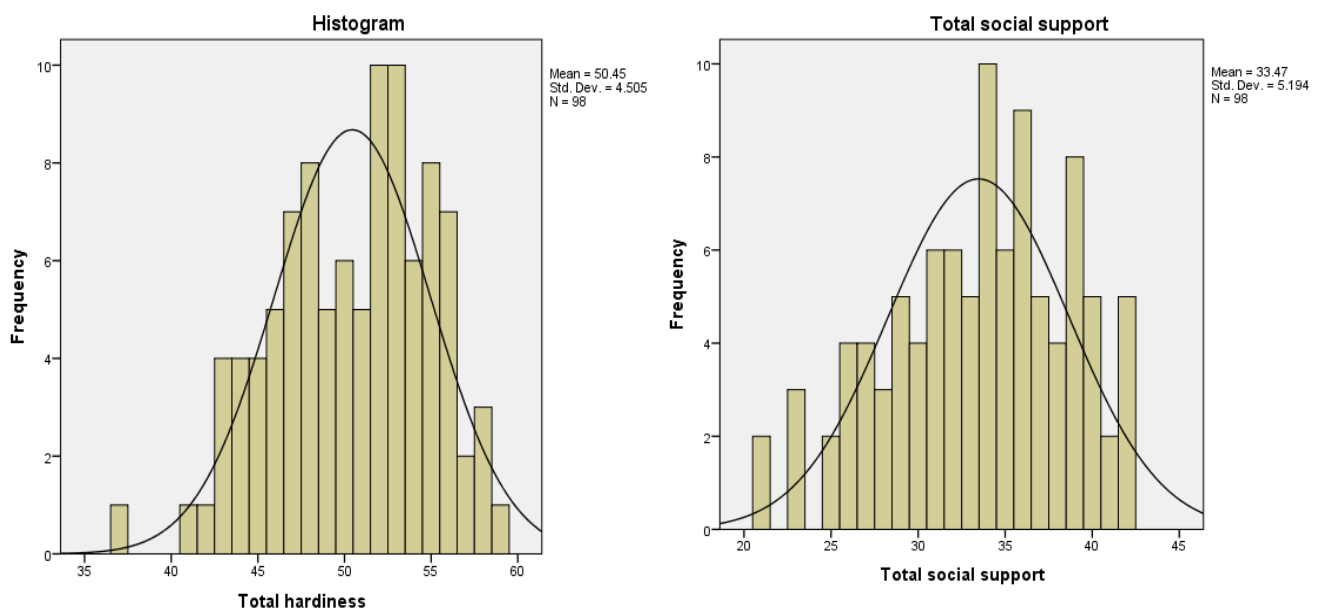
According to the above inspection of Bloxplot for 98 sets of data, there are two cases that were removed which are case numbers 91 and 98, due to having extreme low scores for both family hardiness and social support. Therefore, the final total sample was at 98 family caregivers and this was again tested for assumptions in the next section.

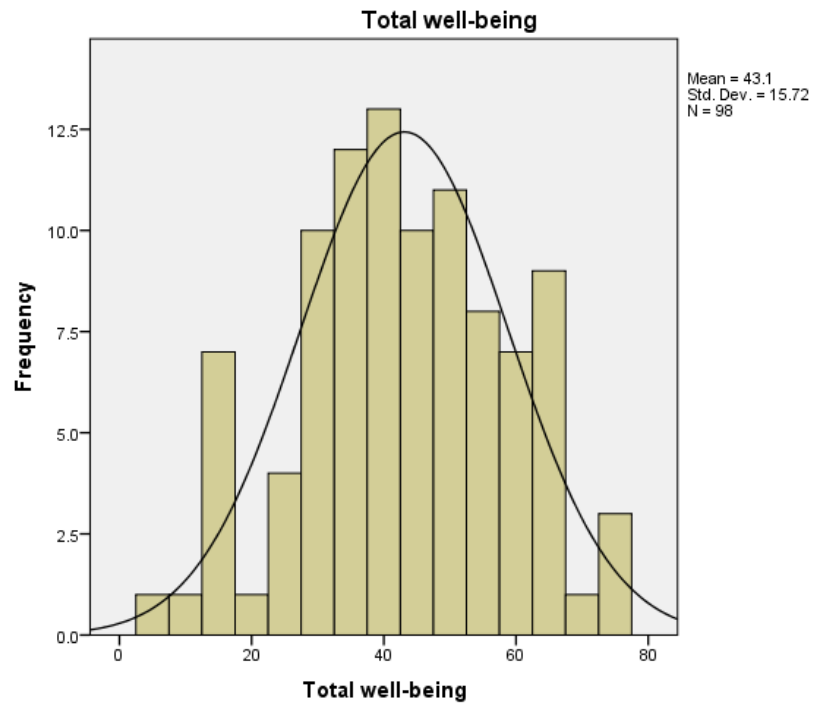
Assumption of Normality ($N = 98$)

1. Standardized Skewness and Kurtosis of family hardiness, social support, and family caregivers' well-being

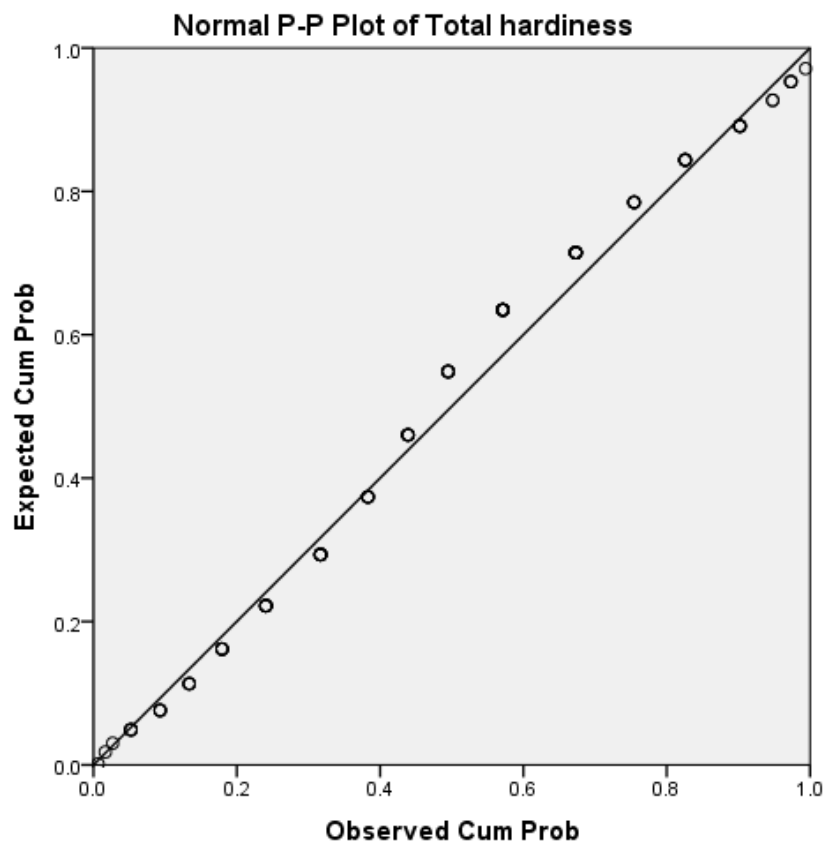
Variables	Skewness	Kurtosis
Family hardiness	-1.52	-0.78
Social support	-1.54	+1.04
Family caregivers' well-being	-0.57	-0.74

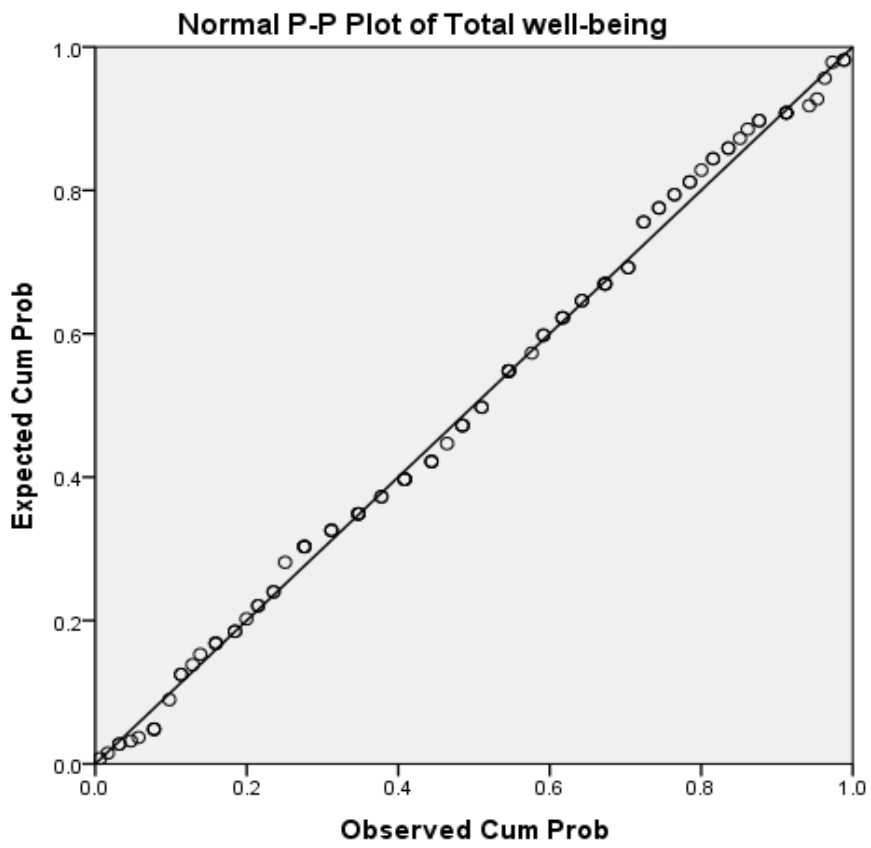
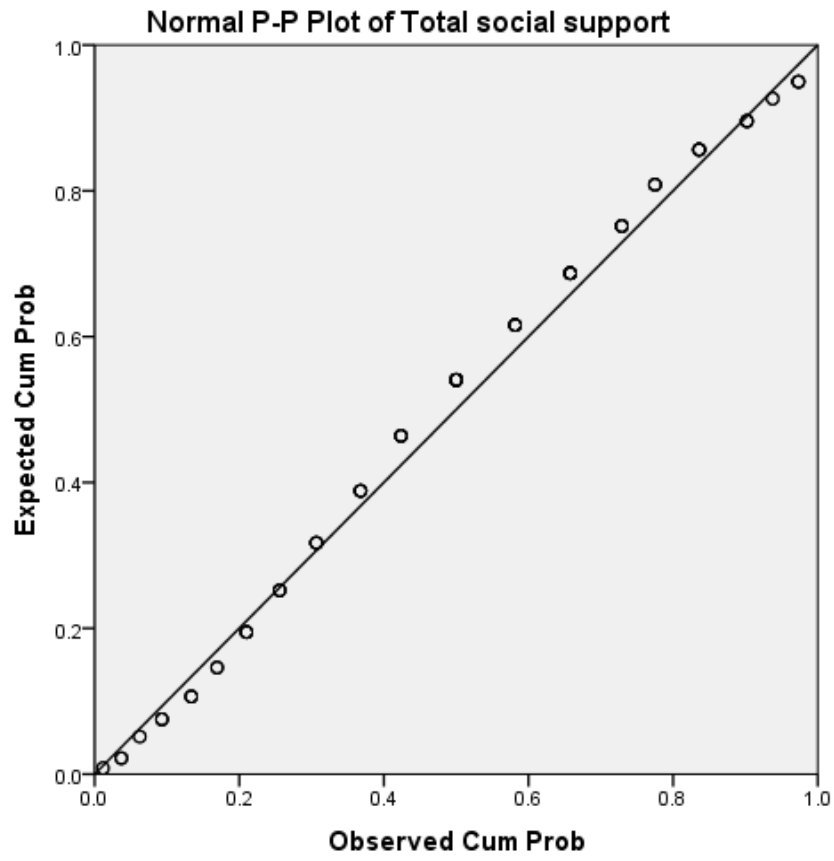
2. Histogram of family hardiness, social support, and family caregivers' well-being

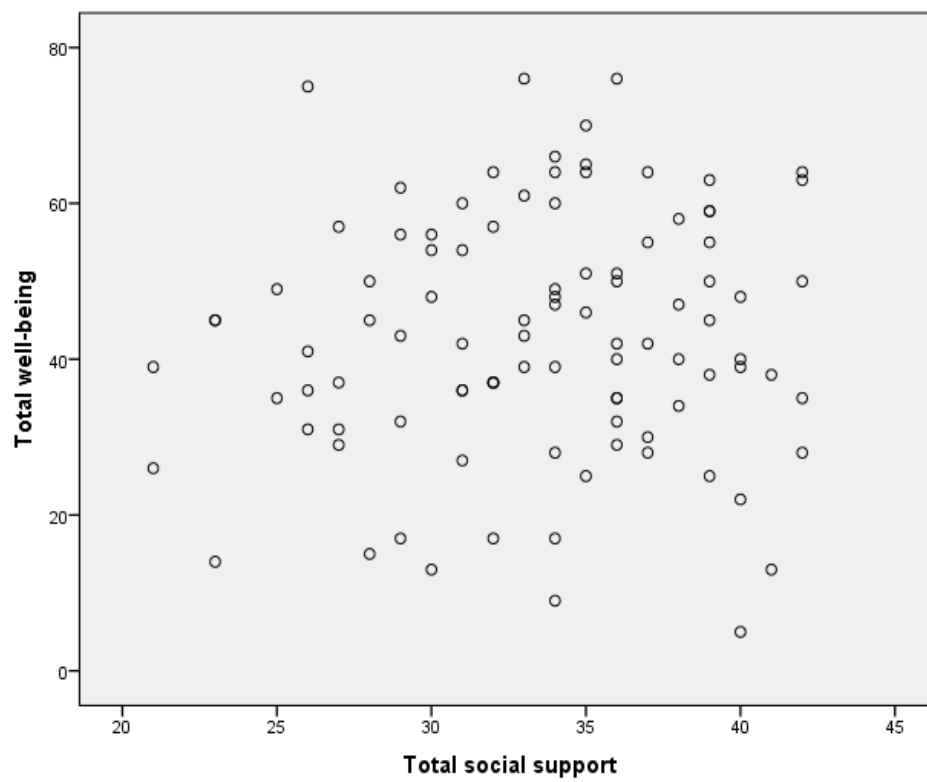
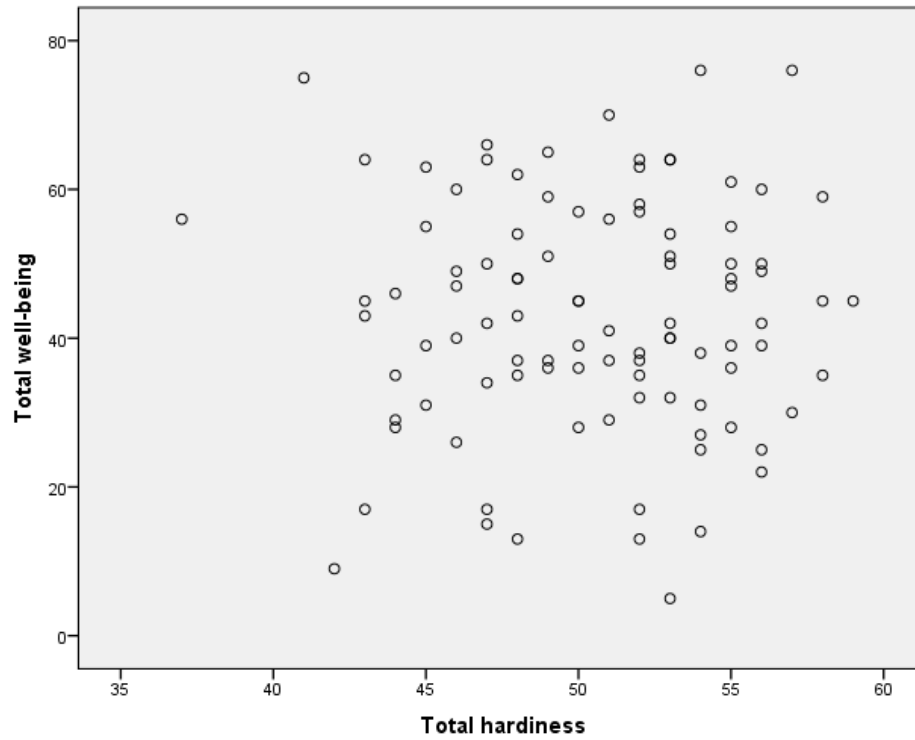




3. Normal P-P plot of family hardiness, social support, and well-being





Linearity and Homoscedasticity ($N = 98$)

APPENDIX J

**Ethical Committee Approval from the Faculty of Nursing, Prince of Songkla
University**



ที่ ศธ ๐๕๒๑.๑.๐๕/๓๓๖๑

คณะพยาบาลศาสตร์
มหาวิทยาลัยสงขลานครินทร์
ตู้ ปณ.๙ ปทฝ.คอหงส์
อ.หาดใหญ่ จ.สงขลา ๙๐๑๑๒

หนังสือฉบับนี้ ให้ไว้เพื่อรับรองว่า นางสาวอรชร หล้าพรหม รหัสนักศึกษา ๕๗๑๐๔๒๐๐๓๐ นักศึกษาหลักสูตรพยาบาลศาสตรมหาบัณฑิต (นานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์ มีความประสงค์ที่จะทำวิทยานิพนธ์ เรื่อง "Predictive Factors of Thai TBI Family Caregivers' Well-being" โดยมี ผู้ช่วยศาสตราจารย์ ดร.สัทมา กิจรุ่งโรจน์ เป็นอาจารย์ที่ปรึกษาวิทยานิพนธ์ ทั้งนี้ วิทยานิพนธ์ของนักศึกษาได้ผ่านการพิจารณาด้านจริยธรรมจากคณะกรรมการประเมินจริยธรรมในงานวิจัย และสอบโครงร่างวิทยานิพนธ์ผ่าน เมื่อวันที่ ๒๙ ตุลาคม ๒๕๕๘ แล้ว


ให้ไว้ ณ วันที่ ๒๗ พฤศจิกายน พ.ศ. ๒๕๕๘

(ผู้ช่วยศาสตราจารย์ ดร.อุมพร ปุญญโสพรรณ)
รองคณบดีฝ่ายวิจัยและบัณฑิตศึกษา ปฏิบัติราชการแทน
คณบดีคณะพยาบาลศาสตร์

APPENDIX J (Continued)

Ethical Approval and Permission for Data Collection from the Hospitals

1. Hatyai Hospital



ที่ ศธ ๐๕๒๖.๑๐๑/ ๓๓๖๕๕

วันที่ ๑๗ สิงหาคม ๒๕๕๘

เรียน ผู้อำนวยการโรงพยาบาลหาดใหญ่

ด้วยนางสาวอรชร หล้าพรหม นักศึกษามหาวิทยาลัยราชภัฏสงขลา คณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์ กำลังดำเนินการทำวิทยานิพนธ์เรื่อง "Predictive Factors of Thai TB Family Caregivers' Well-being" โดยมี ผู้ช่วยศาสตราจารย์ ดร.อัทธพล ศิริรุ่งโรจน์ เป็นอาจารย์ที่ปรึกษาวิทยานิพนธ์ ซึ่งในกระบวนการสร้างเครื่องมือวิจัยในเรื่องนี้ จำเป็นต้องมีการทดลองใช้เครื่องมือวิจัยก่อนเก็บรวบรวมข้อมูลวิจัยเพื่อประกอบการทำวิทยานิพนธ์

ในการนี้ คณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์ จึงขออนุญาตให้ นางสาวอรชร หล้าพรหม ทดลองใช้เครื่องมือวิจัยก่อนเก็บรวบรวมข้อมูลวิจัยเพื่อประกอบการทำวิทยานิพนธ์ โดยใช้แบบสอบถามทั้งสามภาษา ทั้งผู้ดูแลผู้ป่วยเบาหวานเป็นโรค (ทดลองใช้เครื่องมือวิจัย จำนวน ๒๐ คน และนักวิจัยผู้วิจัย จำนวน ๘๐ คน) ณ คลินิกผู้ป่วยนอกตึกศัลยกรรม โรงพยาบาลหาดใหญ่ ระหว่างเดือน สิงหาคม ๒๕๕๘ - มีนาคม ๒๕๕๙ โดยมีคุณณฤช อุภากาศ ตำแหน่งพยาบาลวิชาชีพชำนาญการ เป็นผู้ประสานงานในการเก็บข้อมูลวิจัย ทั้งนี้หากมีข้อสงสัย หรือต้องการรายละเอียดเพิ่มเติม โปรดติดต่อนางสาวอรชร หล้าพรหม โทรศัพท์มือถือ ๐๘๙-๐๘๘๓๐๘๘ หรือ E-mail : orachon.l@gmail.com

จึงเรียนมาเพื่อโปรดพิจารณาให้ความอนุเคราะห์ด้วย จะเป็นพระคุณยิ่ง

ขอแสดงความนับถือ

[Signature]

(ผู้ช่วยศาสตราจารย์ ดร.สุภาพร บุญสุโขทัย)

รองคณบดีฝ่ายวิจัยและบัณฑิตศึกษา ปฏิบัติราชการแทน

คณบดีคณะพยาบาลศาสตร์

๑๙ ส.ค. ๕๘

⑤ เห็นสมควรให้วิจัย ทดลองใช้เครื่องมือวิจัย ๑๑๕๐ คน เก็บรวบรวมข้อมูล

④ เห็นสมควรให้วิจัย ทดลองใช้เครื่องมือวิจัย ๑๑๕๐ คน เก็บรวบรวมข้อมูล

③ เห็นสมควรให้วิจัย ทดลองใช้เครื่องมือวิจัย ๑๑๕๐ คน เก็บรวบรวมข้อมูล

② เห็นสมควรให้วิจัย ทดลองใช้เครื่องมือวิจัย ๑๑๕๐ คน เก็บรวบรวมข้อมูล

ขอแสดงความนับถือ

[Signature]

Dr. ORCH R.R.

๑๙ ส.ค. ๕๘

① เห็นสมควรให้วิจัย ทดลองใช้เครื่องมือวิจัย ๑๑๕๐ คน เก็บรวบรวมข้อมูล

② เห็นสมควรให้วิจัย ทดลองใช้เครื่องมือวิจัย ๑๑๕๐ คน เก็บรวบรวมข้อมูล

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④ เห็นสมควรให้วิจัย ทดลองใช้เครื่องมือวิจัย ๑๑๕๐ คน เก็บรวบรวมข้อมูล

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สำนักงานเลขาธิการ
โทรศัพท์ ๐-๘๑๕๒๑-๒๖๕๖
โทรสาร ๐-๘๑๕๒๑-๒๖๕๖
สำนักงานวิจัย ศูนย์คุณธรรม ๒๒๓๖๒ วิทยาเขตหาดใหญ่

14 S.A. 2558

Expeditious Review ๕ on

๑๙ ส.ค. ๕๘


THE ETHICS COMMITTEE OF HATYAI HOSPITAL

HATYAI HOSPITAL 182 , HATYAI, SONGKHLA 90110 THAILAND

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

ID1	88
Date	28/12/2015 expired 1 year after issuing
Certificate	Certificate of Expedited
Title of project	ปัจจัยทำนายความทุกข์ของญาติผู้ดูแลผู้ป่วยโรคซึมเศร้าในประเทศไทย(Predictive Factors of Thai TBI Family Caregivers' Well- being)
Protocol number	84/2015
Principal investigator	นางสาวอรรชพร ทวีพรหม
Office address	คณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์
Document review 1	Proposal
Document review 2	Question nair

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

Signature of Chairman

Pairoj Boonlaksiri

Signature of Committee

Kanitha Arundon

2. Maharaj Nakhon Si Thammarat Hospital



รหัสโครงการวิจัยที่ 08/2559
เอกสารรับรองเลขที่ 08/2559

คณะกรรมการจริยธรรมการวิจัยในมนุษย์ โรงพยาบาลมหาสารนครศรีธรรมราช

โครงการวิจัย (ภาษาไทย)	ปัจจัยทำนายความเครียดของญาติผู้ดูแลผู้ป่วยเจ็บศีรษะในประเทศไทย
(ภาษาอังกฤษ)	Predictive Factors of Thai TBI Family Caregivers' Well-being
ผู้วิจัยหลัก	นางสาวอรุณร พงษ์พรหม
ตำแหน่ง / สถานะ	นักศึกษาปริญญาโท พสภักดิ์สุทรพยาบาลศาสตรมหาบัณฑิต (พสภักดิ์สุทรนามาชาติ) คณะพยาบาลศาสตร์
สถาบัน	มหาวิทยาลัยสงขลานครินทร์

คณะกรรมการจริยธรรมการวิจัยในมนุษย์ โรงพยาบาลมหาสารนครศรีธรรมราช ได้พิจารณาเห็นชอบ
ให้ดำเนินการศึกษาวิจัยดังกล่าวได้ เมื่อวันที่ 14 เดือน มีนาคม พ.ศ. 2559 และรับรองเป็นระยะเวลา 1 ปี สิ้นสุดระยะ
การรับรอง วันที่ 13 เดือน มีนาคม พ.ศ. 2560

ผู้วิจัยต้องรายงานสถานะของโครงการให้คณะกรรมการจริยธรรมการวิจัยในมนุษย์ โรงพยาบาลมหาสาร
นครศรีธรรมราชทราบตามที่คณะกรรมการฯ กำหนด เพื่อขออนุมัติดำเนินการต่อจนกว่าจะสิ้นสุดระยะเวลาการรับรอง

ลงนาม..... อรุณ

(นางสาวกัญญาณี ทองสงค์)

ประธานคณะกรรมการจริยธรรมการวิจัยในมนุษย์
โรงพยาบาลมหาสารนครศรีธรรมราช

ลงนาม..... อรุณ

(นายอภิชาติ วัชรพันธุ์)

รองผู้อำนวยการฝ่ายการแพทย์ ปฏิบัติราชการแทน
ผู้อำนวยการโรงพยาบาลมหาสารนครศรีธรรมราช

APPENDIX K

List of Experts

There were three experts who examined the content validity of the questionnaires that consisted of the Family Hardiness Index (FHI), the Social Support Index (SSI), and the Family Member Well-Being (FMWB) Index. The experts are:

1. Dr. Nipa Niyomthai

Nursing Lecturer, Department of Medical Nursing, Faculty of Nursing,
Prince of Songkla University, Thailand

2. Assist. Prof. Dr. Patcharee Komjakraphan

Nursing Lecturer, Department of Community Health Nursing,
Faculty of Nursing, Prince of Songkla University, Thailand

3. Miss Narumon Anumas

Advanced Practice Nurse (APN), Hatyai Hospital, Thailand

VITAE

Name Orachorn Lumprom

Student ID 5710420030

Education Attainment

Degree	Name of Institution	Year of Graduation
Bachelor of Nursing	Prince of Songkla University	2014

Scholarship Awards during Enrolment

2012 - 2016 Nursing Scholarship, Faculty of Nursing,
Prince of Songkla University

2014 - 2017 Financial Support for Thesis Fiscal Year 2016,
Graduate School, Prince of Songkla University

Work-Position and Address

Work position Master degree student of Faculty of Nursing,
Prince of Songkla University

List of Publications and Proceedings

Lumprom, O & Songwathana, P (2015, November). Fever Management in Traumatic Brain Injury Patients: A Case Study [Abstract]. *The 1st Udayana international Nursing Conference, Indonesia, November, 6-8, 2015.*

Lumprom, O., Kitrungrate, L., & Songwathana, P (2016, September). Well-being, Family Hardiness, and Social Support Among Thai Caregivers of Persons with Traumatic Brain Injury [Proceeding]. *The 6th International Conference on Sciences and Social Sciences 2016: Mutual Community Engagement toward Global Understanding and Sustainable Well-being, Thailand, September, 22-23, 2016.*