



**The Effect of a Self-Efficacy Enhancing Education Program on Family Caregivers'
Competencies in Caring for Patients with Mild Traumatic Brain Injury
in Yogyakarta, Indonesia**

Erfin Firmawati

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Thesis Title The Effect of a Self-Efficacy Enhancing Education Program on Family Caregivers’ Competencies in Caring for Patients with Mild Traumatic Brain Injury in Yogyakarta, Indonesia

Author Miss Erfin Firmawati

Major Program Nursing Science (International Program)

Major Advisor :

Examining Committee :

.....Chairperson
 (Assoc.Prof.Dr.Praneed Songwathana) (Asst.Prof.Dr.Wongchan Petpichetchian)

Co-advisor :

.....
 (Prof.Dr.Sanguansin Ratanaalert, M. D)

.....
 (Dr.Luppana Kitrungrote)

.....
 (Dr.Marisa Suwanraj)

.....
 (Assoc.Prof.Dr.Praneed Songwathana)

.....
 (DrLuppana Kitrungrote)

The Graduate School, Prince of Songkla University, has approved this thesis as fulfillment of the requirements for the Master of Nursing Science (International Program).

.....
 (Assoc.Prof.Dr.Teerapol Srichana)

Dean of Graduate School

This is to certify that the work here submitted is the result of the candidate's own investigations. Due acknowledgement has been made of any assistance received.

.....Signature
(Assoc.Prof.Dr.Praneed Songwathana)
Major Advisor

.....Signature
(Erfin Firmawati)
Candidate

I hereby certify that this work has not been accepted in substance for any degree, and is not being currently submitted in candidature for any degree.

.....Signature

(Erfin Firmawati)

Candidate

Thesis Title	The Effect of a Self-Efficacy Enhancing Education Program on Family Caregivers' Competencies in Caring for Patients with mild Traumatic Brain Injury in Yogyakarta, Indonesia
Author	Miss Erfin Firmawati
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ABSTRACT

Family caregivers' competencies in caring for patients with mild traumatic brain injury (TBI) are essential in post-acute rehabilitation to prevent the patients having persistent symptoms and complications after being discharged from hospital. This quasi-experimental study aimed to examine the effect of a self-efficacy enhancing education program on family caregivers' competencies regarding perceived confidence and performance in caring for patients with mild TBI in Yogyakarta, Indonesia. Fifty family caregivers and patients with mild TBI who met the inclusion criteria were recruited. The 25 subjects in the control group received the routine care, while another 25 subjects in the experimental group received the routine care and a self-efficacy enhancing education program. The program was constructed using Bandura's four sources of self-efficacy: enactive mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective status. The components of the program included exploring feelings, teaching, sharing information, showing pictures, demonstrating and re-demonstrating, and following-up with telephone calls. The family caregivers' perceived confidence and performance were measured by using the Perceived Confidence Questionnaire (PCQ) and the Performance Questionnaire (PQ). The statistics in this study used paired t-test, independent t-test, Wilcoxon Signed Rank test, and Mann-Whitney U test.

The results of the study showed that the family caregivers' perceived confidence in caring for patients with mild TBI after receiving the intervention was higher than before ($t = -8.44, p < .05$), while the family caregivers' performance in the experimental group in the second week was significantly lower than those in the first

week after discharge ($Z = -2.94, p < .05$). After the completion of the program, the findings showed significant difference of the family caregivers' perceived confidence between the control and the experimental groups ($t = 8.30, p < .05$). A significant difference of the family caregivers' performance between groups was also found ($U = .00, p < .05$).

This study provides evidence that a self-efficacy enhancing education program was effective in improving the family caregivers' competencies regarding perceived confidence and also influencing their performance in caring for patients with mild TBI. Therefore, this program is recommended to extend this knowledge for nursing practices and research.

Keywords: self-efficacy, education program, family caregivers, mild traumatic brain injury

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CHAPTER 1

INTRODUCTION

Background and Significance of the Problem

Traumatic brain injury (TBI) is one of the leading causes of death and disability in the United States of America (USA) (Faul, Xu, Wald, & Coronado, 2010). The number of cases with mild to severe brain injury in the USA is approximately 1.7 million every year, with 1,350,000 visits to an emergency department and 52,000 deaths annually (Faul et al., 2010). According to the Health Department of Indonesia as cited in Ayu (2010), TBI was the seventh leading cause of death in Indonesia in 2007. Similarly in Yogyakarta, Indonesia, TBI was the second cause of death with an annual mortality rate of 12% (Daerah Istimewa Yogyakarta [DIY], 2010). Mild TBI had the highest incidence, as reported by Cassidy, et al. (2004), 70%-90%, of all treated brain injuries. Meanwhile, the cases of mild TBI in Yogyakarta, Indonesia in 2007 accounted for 60% of all treated brain injuries (Kurniawan, 2009). The most common cause of mild TBI is motor vehicle accidents (DIY, 2010; Faul et al., 2010).

Many people who sustain a mild TBI have symptoms that include cognitive, physical, and emotional symptoms. The symptoms occur in 38% to 80% of the patients (Rao & Lyketsos as cited in Hall, Hall, & Chapman, 2005). The common symptoms experienced after a mild TBI are headache, dizziness, fatigue, and memory difficulties (Lannsjo, Geijerstam, Johansson, Bring, & Borg, 2009; Yang, Tu, Hua, &

Huang, 2007). Symptoms may occur alone or in combination and may emerge immediately or within days to up to three months after the injury. The symptoms occur in approximately 59% to 91% of patients in one month after the injury (Paniak et al., 2002), 45% within two months (Yang, et al., 2007), 41.8% to 58% within three months (Dischinger, Ryb, Kufera, & Auman, 2009; Kashluba et al., 2004; Lundin, De Boussard, Edman, & Borg, 2006), and more than three months at around 21% to 62% (Hou et al., 2011; Roe, Sveen, Alvsaker, & Bautz-Holter, 2009). Symptoms are usually resolved within days, weeks (Emanuelson, Andersson, Bjorklund, & Stalhammar, 2003), or within three months (Lannsjo et al., 2009), but several patients continue exhibiting symptoms for more than three months (Emanuelson et al., 2003).

Mild TBI is usually not life threatening, consequently a patient with a mild TBI is treated and released from an emergency department, with no hospital admission and receives medication only (Faul et al., 2010). However, the admission criteria for mild TBI may differ as shown in Indonesia. According to the guideline of treatment for patients with mild TBI in Indonesia, patients need to be hospitalized for observation within three days of their injury (Siswanto & Wahyu, 2012). Therefore in short periods of hospitalization, and consequently after discharge, mild TBI patients need to be monitored. Fabbri et al. (2004) reported that patients with mild TBI and a negative computed tomography scan developed intracranial injuries in 1.4% of patients after being discharged and 0.8% patients had died at home six months after their discharge. Moreover, mild TBI patients have difficulties in activities of daily living, returning to pre-injury work status and heightened emotional distress (Bay & Bergman, 2006). Bay and Bergman reported that these difficulties are associated with

persistent post-concussion symptoms after a mild TBI. Therefore, family caregivers are the key persons who are needed in providing care for patients with mild TBI after discharge.

Family caregivers carry the primary responsibility for post acute rehabilitation. A previous study found that family caregivers contributed significantly to the patients' psychological adjustment of their disability and emotional dysfunction; a family's distress correlated strongly with increased rates of patients' neurobehavioral symptoms (Testa, Malec, Moessner, & Brown, 2006). The family caregivers can help prevent the development of mild TBI symptoms and/or reduce their duration, number and severity (Department of Veterans Affairs & Department of Defense [DVA/DoD], 2009) by symptoms assessment, symptoms management, and symptoms evaluation after provided management symptoms. As a result, persistent symptoms and complications of mild TBI can be prevented (DVA/DoD, 2009).

In reality, family caregivers with mild TBI patients often felt incompetent due to lack of confidence about their caregiving, because they do not have the adequate knowledge and skills (Utami, 2012). Additionally, several studies found that the family caregivers had anxiety and stress before the patient's discharge often due to the patient's neurobehavioral disturbance (Testa et al., 2006) and the difficulty in managing the symptoms (Falk, von Wendt, & Klang, 2008). Moreover, before their patients discharge from hospital, most family caregivers reported that they received limited and inconsistent information (Lefebvre, Pelchat, Swaine, Gelin, & Levert, 2005), and they met with little guidance (Utami, 2012). Therefore,

improving the family caregivers' competencies in caring for patients with mild TBI is important.

Several factors may influence the family caregivers' competencies in caring for patients, and one of these factors is self-efficacy (Kouri, Ducharme, & Giroux, 2011; Utami, 2012). Self-efficacy is one of the important factors that influence the family caregivers' competencies in caring for patients with mild TBI (Utami, 2012). Self-efficacy is one's self judgments of her or his personal capabilities to initiate and successfully perform a specified task (Bandura, 1997). Based on Bandura's theory self-efficacy operates as a key factor in individual competency which is constructed from four sources including enactive mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective status. People who have high self-efficacy will positively affect performance and would be more successful in completing those tasks (Bandura, 1997). High self-efficacy positively correlates with the performance of family caregivers (Kouri et al., 2011).

Several interventions to improve family caregivers' competencies in terms of perceived confidence and performance in caring for patients with mild TBI were reviewed. One of the most common interventions is an education program. Providing an education program that is focused on the family caregiver is needed because in the early stages of post injury, the patient still has difficulties in receiving some information, concentrating, remembering discharge instructions (Bazarian et al., 2005), and making decisions or finding solutions to manage their symptoms (Bell et al., 2008; Sayegh, Stanford, & Carson, 2010). Moreover, it was found that providing only education to the patients in the early phase showed no significant

difference in the patient's outcome including an improvement of symptoms after a mild TBI (Elgmark, Emanuelson, Bjorklund, & Stalhammar, 2007; Heskestad et al., 2010).

Educational programs could increase the family caregivers' knowledge (Shocker, 2008) and skill (Kouri et al., 2011), and reduce the family caregivers' stress and anxiety (Backhaus, Ibarra, Klyce, Trexler, & Malec, 2010; Kreutzer et al., 2010). Moreover, an education program may increase family caregivers' competencies in terms of self-efficacy (Backhaus et al., 2010; Srijumnong, 2010; Utami, 2012).

One quasi experimental study in Indonesia was conducted by Utami (2012) who provided an education program for family caregivers to improve their self-efficacy in caring for patients with mild TBI. The family caregivers' self-efficacy in term of perceived confidence was measured before and after the intervention given in the emergency department. The contents being given were information of mild TBI that included warning signs, postconcussion symptom, diet, activity, and medication. The result showed that this education program improved family caregivers' self-efficacy in terms of perceived confidence. However, this study was not constructed based on Bandura's self-efficacy theory and did not measure the family caregivers' performance while they were caring for patients with mild TBI at home; whereas the family caregivers' must have some particular skills in the early detection, the monitoring of warning signs and the management of the symptoms of these patients. Therefore, it is necessary to examine a self-efficacy enhancing education program on the family caregivers' competencies including perceived confidence and performance in caring for patients with mild TBI beyond the emergency department and including follow-up after discharge.

Objectives

The objectives of this study were as follows:

1. To compare family caregivers' perceived confidence in caring for patients with mild TBI before and after receiving a self-efficacy enhancing education program.
2. To compare family caregivers' performance in caring for patients with mild TBI in the first week and in the second week after discharge in those who receive a self-efficacy enhancing education program
3. To compare family caregivers' perceived confidence in caring for patients with mild TBI who receive a self-efficacy enhancing education program and those who receive the routine care
4. To compare family caregivers' performance in caring for patients with mild TBI who receive a self-efficacy enhancing education program and those who receive the routine care

Research Questions

The research questions of this study are stated as follows:

1. Is the family caregivers' perceived confidence in caring for patients with mild TBI after receiving a self-efficacy enhancing education program higher than before receiving the program?

2. Is the family caregivers' performance in caring for patients with mild TBI in the second week after discharge similar to that in the first week after discharge in those who receive a self-efficacy enhance education program?

3. Is the family caregivers' perceived confidence in caring for patients with mild TBI who receive a self-efficacy enhancing education program higher than those who receive the routine care?

4. Is the family caregivers' performance in caring for patients with mild TBI who receive a self-efficacy enhancing education program higher than those who receive the routine care?

Conceptual Framework

The conceptual framework of this study was constructed based on the self-efficacy theory from Bandura (1997), the content of the education program and literature review about family caregivers' competencies in caring for patients with mild TBI. According to Bandura (1997), self-efficacy is one's self-judgment of one's personal capabilities to initiate and successfully perform a specified task at designated levels, one expends greater effort, and perseveres in the face of adversity. Banduras' theory explains how people acquire and maintain certain behavioral patterns and provide the basis for intervention strategies. This theory states that self-efficacy relies on one's self judgments of personal capabilities on how to initiate and completely perform specific skills at designated levels, expends greater effort, and perseveres in the face of adversity. Self-efficacy is a person's belief in his or her capability to do

activities to avoid disease. People can undertake decision making in self-monitoring and adhere the recommendations relating to their health. Good self-efficacy may enable family caregivers to be competent in providing care for patients with mild TBI after discharge from hospital. Self-efficacy is constructed from four sources of information: physiological and affective states, enactive mastery experiences, vicarious experiences, and verbal persuasion (Bandura, 1997).

The first is physiological and affective states. Physiological and affective states influence people's capabilities to make judgments of their personal efficacy. Physiological indicators of efficacy play an especially influential role in health functioning and in activities requiring physical strength and stamina. People who have fatigue, pain, and aches may influence their performance. In addition, affective states can widely affect beliefs of personal efficacy. People who have positive mood enhance perceived self-efficacy, however people who have stress can decrease people's judgments of their personal efficacy (Bandura, 1997). In this program, the researcher provides an opportunity for the family caregivers to express their feelings and concern related to caring for patients with mild TBI.

The second is verbal persuasion from others which is another source of continued self-efficacy development. Verbal persuasion serves as a further means of strengthening people's beliefs that they possess the capabilities to achieve what they seek. It is widely used because of its easy and ready availability (Bandura, 1997). In this program, the participants received verbal reinforcement, motivation, suggestions and advice both at hospital and at home. Moreover, the participants received teaching

about the definition of mild TBI, warning signs and symptoms following mild TBI, and caring for patients with mild TBI.

The third is vicarious experience which is produced by observing the actions of others, often called modeling. Modeling is an effective way to raise efficacy (Bandura, 1997). Vicarious experiences build efficacy in those who are uncertain about their own abilities or have limited prior experiences. Personal efficacy can also be impacted by the verbal persuasion of others affirming or negating capability. Humans have evolved an advanced capacity for observational learning that enables them to acquire knowledge, attitudes, values, emotions, and competences through the rich fund of information conveyed by actual and symbolic modeling (Bandura as cited in Bandura, 2002). Therefore, this program will use modeling by sharing information about the success of management for patients with mild TBI and showing some pictures about symptoms management for patients with mild TBI such as neck stretching, sleeping position, and vestibular exercises.

The fourth is enactive mastery experiences. This source is the most influential source of efficacy information because it provides the authentic evidence of whether one can master what it takes to succeed (Bandura, 1997). Mastery experiences are developed by actually learning and practicing the appropriate behavior. It is perceived as the greatest influence on a person's perception on self-efficacy. Enactive mastery experience is integrated into the self-efficacy enhancing education program by a demonstration about symptoms assessment using the symptoms checklist and management symptoms such as neck stretching, sleeping position, and vestibular exercises. In addition, the researcher encourages family

caregivers to re-demonstrate the symptoms assessment and management symptoms. These will help family caregivers to master them, and gives them more confidence for the next time when they use it.

The education program is defined as the program to provide information for the family caregiver with a mild TBI patient. Based on the literature review, the contents of the education program includes the definition of mild TBI, the warning signs and symptoms following a mild TBI, symptoms assessment, symptoms management and symptoms evaluation. The education program was provided using a teaching method, demonstration, and follow-up telephone calls.

Family caregivers' competencies in caring for mild TBI patient refers to the capabilities of family caregivers in providing care for the patient with a mild TBI. Based on the literature review, their capabilities include symptoms assessment, symptoms management, and symptoms evaluation of the patient with a mild TBI. The conceptual framework used to guide this study is presented in Figure 1.

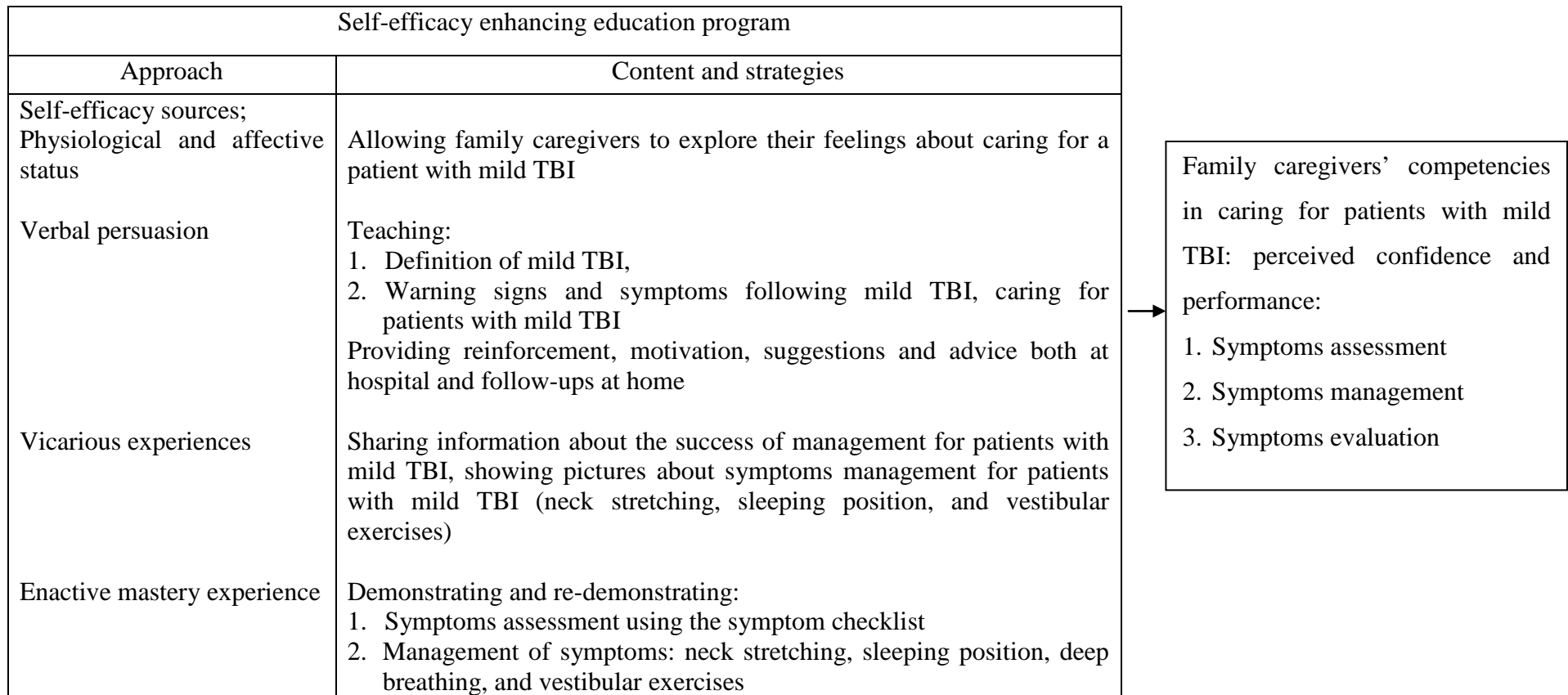


Figure 1. Conceptual framework of a self-efficacy enhancing education program on family caregivers' competencies in caring for patients with mild TBI

Hypotheses

The hypotheses of this study were:

1. The family caregivers' perceived confidence in caring for patients with mild TBI after receiving a self-efficacy enhancing education program is higher than before receiving the program.
2. The family caregivers' performance in caring for patients with mild TBI in the second week after discharge is similar to that in the first week after discharge in those who receive a self-efficacy enhancing education program
3. The family caregivers' perceived confidence in caring for patients with mild TBI who receive a self-efficacy enhancing education program is higher than those who receive the routine care.
4. The family caregivers' performance in caring for patients with mild TBI who receive a self-efficacy enhancing education program is higher than those who receive the routine care.

Definitions of Terms

A self-efficacy enhancing education program refers to the set of activities over two weeks that has been developed by the researcher based on the four sources of self-efficacy as strategies to enhance family caregivers competencies which include; enactive mastery experience, vicarious experience, verbal persuasion, and physiological and affective states (Bandura, 1997). This program was conducted with the family caregiver who stands beside the patient through individual education over

approximately 60 minutes at the second day of hospitalization. The programs consist of explore feelings, teaching and providing reinforcement and support, sharing information about the successfully of mild TBI management and providing pictures about mild TBI management, demonstrating and re-demonstrating. Moreover, this program included follow-up telephone calls twice after patient discharge.

Routine care refers to the usual care by nurses for the family caregiver following the regular treatment for the patient with a mild TBI on the ward including assessment (vital signs, physical examination, and complaints assessment), providing medication, physical examination from physicians and receiving information regarding the patient's condition from doctors and nurses.

Family caregiver's competencies refer to the family caregiver's perceived confidence and performance regarding care for the patient with a mild TBI, as follows;

Perceived confidence regarding care for patients with mild TBI is the level of confidence of the family caregivers to perform the symptoms assessment, symptoms management, and symptoms evaluation of patients with mild TBI. This was measured by using the Perceived Confidence Questionnaire (PCQ) developed by the researcher based on the literature review. A higher score indicates higher perceived confidence of family caregivers.

Performance regarding care for patients with mild TBI refers to the perceived ability of family caregivers to provide care in appropriate time and action for patients with mild TBI that have been performed over the past week in order to assess the warning signs and mild TBI symptoms, symptoms management, and symptoms evaluation. This was measured by using the Performance Questionnaire

(PQ) developed by the researcher based on the literature review. A higher score indicates higher performance on family caregivers.

Scope of the study

This study was conducted to test the effect of a self-efficacy enhancing education program on family caregivers' competencies in caring for patients with mild traumatic brain injury in Yogyakarta, Indonesia. The subjects were recruited from the surgical ward at PKU Muhammadiyah Yogyakarta and PKU Muhammadiyah Bantul Hospital, Yogyakarta Indonesia from November 2012 to February 2013.

Significance of the Study

The outcomes of this study provide evidence related to the utilization of a self-efficacy enhancing education program in improving family competencies in caring for patients with mild TBI. This study will be useful not only for the family caregivers but also the mild TBI patients regarding the management of mild TBI after discharge. Moreover, the results of this study provide relevant information for nurses or other health care professionals and also for future researchers.

CHAPTER 2

LITERATURE REVIEW

This chapter presents the literature review which includes the following topics.

1. Overview of mild traumatic brain injury (mild TBI)
 - 1.1. Definition of TBI and mild TBI
 - 1.2. Pathophysiology of mild TBI
 - 1.3. Symptoms of mild TBI
 - 1.4. Warning signs after mild TBI
 - 1.5. Complications of mild TBI
 - 1.6. Impacts of mild TBI
 - 1.7. Mild TBI Management in Indonesia
2. Family caregivers' competencies in caring for patients with mild TBI
 - 2.1. Definition of family caregivers
 - 2.2. Family caregivers' competencies in caring for mild TBI patients
 - 2.3. Factors contributing to family caregivers' competencies
3. Education program for family caregivers in caring for patient with mild TBI
 - 3.1. Education program
 - 3.2. Self-efficacy in the education program
 - 3.3. The existing educational program for family caregivers with TBI
4. Summary

Overview of Mild Traumatic Brain Injury (Mild TBI)

Definition of TBI

TBI is a traumatically induced structural injury and/or physiological disruption of brain function as a result of an external force that is indicated by new onset or worsening of at least one of specified set of clinical signs, immediately following the event (1) any period of loss or a decreased level of consciousness, (2) any loss of memory for events immediately before or after the injury, (3) any alteration in mental state at the time of the injury for example confusion, disorientation, and slowed thinking, (4) neurological deficits for instance weakness, balance disturbance, praxis, paresis/plegia, change vision, aphasia, (5) intracranial lesion (Department of Veterans Affairs, Department of Defense [DVA/DoD], 2009).

TBI is classified in two types; there are closed head injury, and open head injury (Boss, 2010; Morris, 2010). Closed head injury is the injury to the brain without the occurrence of the breaking of the skull or any of the meninges, and the brain itself is not externally penetrated. Closed head injuries are often the result of blunt force to the skull. Types of closed injuries are concussion, contusion, and laceration (Boss, 2010). Shaking of the brain is the cause of transient neurological deficit in concussion injury. Clinical manifestations include immediate loss of consciousness lasting from minutes to hours, loss of reflexes at the moment, amnesia for the period immediately prior to and following the event. Others symptoms are headache, drowsiness, confusion, dizziness, irritability, and visual disturbances. Open head injury is penetrated or broken at the time of impact. Open head injuries include

skull fractures, blunt force trauma, or gunshot. Open head injuries occur when the skull and meninges is penetrated by an external object (Boss, 2010).

The diagnosis is based on the depth and length of the coma, durations of posttraumatic amnesia, time to respond consistently, neuroimaging and electrophysiological studies, and measurements of brainstem function (DVA/DoD, 2009). The severity of TBI divided into three general categories: mild, moderate, and severe. A mild injury includes a Glasgow Coma Scale (GCS) ranging from 13 to 15, moderate injury includes a GCS ranging from 9 to 12, and severe injury is characterized by a GCS range of 3-8 (Jennett & Teasdale as cited in Selladurai & Reilly, 2007).

Definition of Mild TBI

Mild TBI is an acute brain injury resulted from mechanical energy to the head from external physical forces. The criteria for clinical identification includes one or more of the following: confusion or disorientation, loss of consciousness for 30 minutes or less, post traumatic amnesia for less than 24 hours, and/or other transient neurologic abnormalities like seizure, focal signs, and intracranial lesion not requiring surgery; and GCS score of 13 to 15 at 30 minutes post-injury or later upon presentation for health care, these manifestations of mild TBI must not be due to drugs, alcohol, medications, or be caused by other injuries or treatment for other injuries (for instance systemic injuries, facial injuries), caused by other problems (e.g., psychological trauma, language barrier or coexisting medical conditions) caused by penetrating cranio-cerebral injury (World Health Organization [WHO] as cited in Ruff, Iverson, Barth, Bush, Broshek & the NAN Policy and Planning Committee,

2009). The causes of mild TBI are falls, motor vehicle trauma, being struck by something, hitting head on something, assault or intentional head trauma (including blast injury), and sports related injury (Faul, Xu, Wald, & Coronado, 2010).

The grading scale of concussion consists of three grades (Cantu, 2001). Grade 1 is characterized by no loss of consciousness, either PTA or post-concussion signs, and symptoms that clear in less than 30 minutes. Grade 2 is characterized by loss of consciousness lasting less than 1 minute and PTA or post-concussion symptoms lasting longer than 30 minutes but less than 24 hours. Grade 3 is characterized by loss of consciousness lasting more than 1 minute or PTA lasting longer than 24 hours or post-concussion signs or symptoms lasting longer than 7 days.

In conclusion, mild TBI is an acute brain injury resulted from external mechanical force to the head that had at least one characteristic as follows: Glasgow coma score 13-15 at 30 minute after injury, duration of loss of consciousness for 30 minute or less, post traumatic amnesia less than 24 hours, no focal neurology deficit and normal neuro-imaging

Pathophysiology of Mild TBI

Neuropathology of mild TBI is Diffuse Axonal Injury [DAI] (Cushman, Agarwal, & Fabian, 2001; de Kruijk et al., 2002). DAI caused by shearing forces generated within brain parenchyma by sudden acceleration-deceleration or torsional (Cushman et al., 2001). These forces undermine fragile structures in long axis of the brain or stretching of axons. It can affect the small blood vessels and axons. These may result a cascade of neurochemical changes (Bazarian et al., 2005).

Axonal injury leads to localized transport failures within the axon and that leads to axon's swelling and lysis followed fatty degeneration of nerve fibers. The extent of axonal injury can be correlated with GCS score, duration of LOC and duration of PTA (Cushman et al., 2001). Moreover, small vessels damages can produce pethechical hemorrhages or local/focal edema. These histopathological changes involved microglial cell proliferation (Cushman et al., 2001). Then, it can result on metabolic cascade that characterized by an initial depolarization of neuronal membranes and the release of excitatory amino acids, particularly glutamate, which produces fluxes of calcium and potassium ions across neural and vascular tissue resulting in at first a hypermetabolic glycolytic state as the neurons attempt to restore equilibrium. There follows a calcium ion–induced vasoconstriction that reduces cerebral blood flow and glucose delivery to the brain (Giza & Hovda, 2001). As a result, cerebral oxygenation is reduced (Cote, Neary, Goodman, Parkhouse, & Bhambani as cited in Len & Neary, 2010). This reduction in cerebral oxygenation may produce the development of oxygen consumption-demand imbalance. This mismatch can lead to ischemic or hypoxic situations resulting in secondary brain tissue damage. Then, profound hypoperfusion of brain tissue may occur (Buchner, Meixensberger, Dings, & Roosen as cited in Len & Neary, 2010). The increased oxygen demands of the TBI-injured brain stress the autoregulatory and cerebrovascular reactivity responses to physiological disturbances. This condition may potentially result in cell dysfunction and increase the vulnerability of the cell to a second insult (Lang as cited in Len & Neary, 2010).

Symptoms of Mild TBI

Symptoms experienced after mild TBI can be categorized as physical, affective/emotional, and cognitive symptoms (Defense Centers of Excellence [DCoE], 2012; DVA/DoD, 2009).

Physical symptoms. Physical symptom usually refers to somatic symptoms (Simon, Vonkorff, Fullerton, & Ormel, 1999). The physical symptoms included headache, dizziness, nausea, fatigue, sleep disturbance, blurred vision, sensitivity to noise, sensitivity to light, hearing difficulties/loss, seizure and tinnitus (DVA/DoD, 2009). Physical symptoms mostly emerged in the early after injury up to one month after injury such as dizziness, headache, fatigue, and nausea (Dischinger, Ryb, Kufera, & Auman, 2009; Mackenzie & McMillan, 2005; Yang, Tu, Hua, & Huang, 2007). Physical symptoms may occur within three months after injury (Kashluba, Hanks, Casey, & Millis, 2008; Lannsjo, Geijerstam, Johansson, Bring, & Borg, 2009; Lundin, De Boussard, Edman, & Borg, 2006) and more than three months (Fourtassi et al., 2011; Dean, O'neil, & Sterr, 2012; Hou et al., 2011; Roe, Sveen, Alvsaker, & Bautz-Holter, 2009). Headache and dizziness are the common prevalent physical symptoms of mild TBI (Bryan & Hernandez, 2011; Dikmen, Machamer, Fann, & Temkin, 2010; Kashluba et al., 2008; Lannsjo et al., 2009; Packard, 2008; Ponsford, Cameron, Fitzgerald, Grant, & Mikocka-Walus, 2011).

Headache was prominent in the early after injury stage up to two weeks after injury (Dischinger et al., 2009; Yang et al., 2007). Patients with mild TBI reported having headache soon after injury as high as 90% (Nicholson & Martelli, 2004). This symptom may occur until three months after injury (Bergman, 2011; Fourtassi et al., 2011; Kashluba et al., 2004). Headache can emerge more than that

time; some researchers found 18%-22% of post traumatic headache lasting longer than 1 year (Lew et al., 2006; Nicholson & Martelli, 2004). The type of headache has been associated with mechanism of injury. Blunt force trauma is usually associated with tension type headache while blast injury is associated with a higher rate of migraine type (Lew et al., 2006; Terrio et al., 2009).

Headache in mild TBI can be categorized into two types, migraine and tension-type headache types (Headache Classification Subcommittee [HCS], 2004). A migraine headache may be described as a type of headache that causes a throbbing and pulsating pain around the head. Migraine has two subcategories (HCS, 2004). Firstly, migraine without aura (common migraine) it attacks last for 4–72 hours and has at least 2 of the following characteristics: pulsating pain, unilateral, moderate to severe intensity of pain, and worsened with or causing avoidance of usual physical activity. In addition, at least one of the following symptoms must be present: nausea, vomiting, photophobia, and phonophobia (HCS, 2004). Secondly, migraine with aura, it attacks have the same criteria as common migraine; in addition, the aura presents within 60 minutes of the onset of headache. Aura consists of one of the following fully reversible features: visual changes, sensory changes, or dysphasic speech (HCS, 2004). Tension-type headache, also called stress, muscle contraction, or essential headaches. This type is characterized by headache lasting for 30 minutes–7 days without nausea or vomiting, bilateral pressing or tightening pain quality (non-throbbing), mild or moderate in intensity, and not precipitated by usual physical activity (HCS, 2004).

Dizziness is a sensation of faintness and whirling or an inability to maintain normal balance in a standing or seated position or sensation of unsteadiness

accompanied by a feeling of movement within the head (DCoE, 2012). Dizziness is categorized in three types, there are vertigo, disequilibrium, and lightheadedness (DCoE, 2012). Vertigo is a false sense of motion (spinning, rocking, and movement of environment). Disequilibrium is being off-balance or unsteady while standing or attempting to walk. Lightheadedness is feeling faint or other vague sensations such as disconnect with environment. Dizziness was one of common symptom that occurred in the early after injury stage up to two weeks after injury (Dischinger et al., 2009; Yang et al, 2007) up to three months (Bergman, 2011; Fourtassi et al., 2011; Kashluba et al., 2004).

Another physical symptom is fatigue. Fatigue is overwhelming feelings of exhaustion or tiredness, diminished energy or increased need to rest (Stulemeijer et al., 2006). According to Stulemeijer et al. (2006) fatigue has been shown to be associated with limitations in daily functioning and quality of life. Fatigue is common symptom following mild TBI as nearly one third of patients suffering with mild TBI reported severe fatigue for six months after injury (Stulemeijer et al., 2006). Norrie et al. (2010) found fatigue after mild TBI prevalence was 68%, 38% and 34% at 1 week, 3 and 6 month. Moreover, Sundstrom et al. (2007) found that persistent fatigue prevalence rates of 22–59%. Studies have shown that post-injury fatigue can persist for years and has been documented up to 5 years following injury (Bushnik, Englander, & Wright, 2008).

Cognitive symptoms. Cognitive symptoms refer to disturbance with thought, attention, memory, concentration, and speed of processing (DVA/DoD, 2009). Cognitive symptoms occurred within one month after injury (Mackenzie & McMillan, 2005; Yang et al., 2007) within three months after injury (Laansjo et al,

2009; Lundin et al., 2006; Ponsford et al., 2011; Yang et al., 2007) and more than three months (Dean et al., 2012; Fourtassi et al., 2011; Hou et al., 2011; Roe et al., 2009). The common cognitive symptoms are difficulty remembering (Fourtassi et al., 2011; Kashluba et al., 2004) and difficulty thinking (Dean et al., 2012; Mackenzie & McMillan, 2005).

Emotional symptoms. Emotional symptoms refer to a state of feeling related to aspect of consciousness. The emotional symptoms consisted of irritability, frustration, anger, anxiety (Lannsjö et al., 2009; Sheedy, Harvey, Faux, Geffen, & Shores, 2009; Yang et al., 2007), mood swings, depression, hyperactivity, and aggression (Sohlberg & Mateer, 2001). These symptoms mostly occurred within three months after injury (Lannsjö et al., 2009; Sheedy et al., 2009; Yang et al., 2007) or more than three months (Dean et al., 2012; Fourtassi et al., 2011; Hou et al., 2011; Roe et al., 2009). Some studies found that emotional symptoms may occur within one after injury such as anxiety and feeling depressed (Dischinger et al., 2009). The common emotional symptoms are irritability (Lannsjö et al., 2009; Sheedy et al., 2009; Yang et al., 2007), and anxiety (Dischinger et al., 2009).

In conclusion, symptoms experienced after mild TBI can be categorized as physical, cognitive, and emotional/affective symptoms. Physical symptoms mostly occurred in the early stage after injury up to three months, followed by cognitive symptoms. Emotional symptoms mostly occurred more than three months after injury. The common physical symptoms are headache and dizziness, while irritability and feeling depressed are the common emotional symptom. In addition, the common cognitive symptoms are difficulty remembering and difficulty thinking.

Warning Signs and Symptoms

Warning symptoms after mild TBI refer to the increased intracranial pressure (IICP). The signs and symptoms of IICP are impaired consciousness, decreased responsiveness, disorientation, restlessness, increased respiratory effort, mental confusion, projectile vomiting, and a constant headache or a headache that gets worse (increasing in intensity and aggravated by movement or straining). This occurs as IICP causes pressure and stretching of venous and arterial vessels in the base of the brain. Additionally, weakness in one extremity or on one side of the body, this occurs as IICP compresses the pyramidal tracts. Causes of IICP are increased pressure in the brain resulting from edema or hemorrhage or increased volume of cerebral spinal fluid (CSF) (Smeltzer, Bare, Hinkle, & Cheever, 2010). Other signs and symptom that should be considered are that patients can't wake up, act strange, say things that do not make sense (change in behavior), cannot remember new events, recognize people or place (increased confusion), pass out or have a blackout or a seizure, cannot move parts of patients' body or clumsiness, have blurred vision or slurred speech, and experience continual fluid or bleeding from the ear or nose (Selladurai & Reilly, 2007).

Complications of Mild TBI

The complications of mild TBI patient were 8% pathological finding, dominated by hemorrhages like subarachnoid hemorrhage (1%) and subdural hemorrhage (1%) (Geijerstam & Britton, 2010). Additionally, Fabbri et al. (2004) found 1.4% of patients developed intracranial injuries after discharge and 0.8% patients had died at home after six months.

Impacts of Mild TBI

There are two impacts of mild TBI which include impacts in patients and impacts on family caregivers

Impacts of mild TBI in patient. Impact of mild TBI in patient includes difficulties in activities of daily living, interpersonal relationships, return to pre-injury work status, and heightened emotional distress (Bay & Bergman, 2006). These difficulties are associated with persistent post-concussion symptom after mild TBI that symptom occurred in patient more than three months (Bay & Bergman, 2006). Lundin et al. (2006) found 25% of mild TBI patients had dysfunction in at least one domain of everyday life, such as work, relationships, social and leisure activities at three months post injury.

Impact of mild TBI on family caregivers. The impact of mild TBI on family caregivers include in four aspects. The first one is psychological impact. The most impact of TBI is stress/distress of family caregivers (Ganesalingam et al., 2007; Prigatano, 2005; Testa et al., 2006). Distress among family caregivers and family members of patient with TBI may affect the entire family caregivers' system. Neurobehavioral disturbance in patient with TBI was the strongest predictor of family caregivers distress (Testa et al., 2006). The most common predictive factors are changes in behavioral control and cognitive difficulties (Ergh, Rapport, Coleman, & Hanks, 2002). Other factors included the injured individual's emotional state (Testa et al., 2006). Ganesalingam et al. (2007) found that post-concussion symptoms in after injury was related to higher ratings of family distress at 3 months. Emotional problem like distress in the family caregivers can influence patient's rehabilitation (Sander, Carosellis, Becker, Neeses, & Scheibel, 2002; Sady et al., 2010). Family caregivers

who are experiencing distress may not be effective partners in the rehabilitation process (Sander et al., 2002). A person with less family caregiver distress was predictive to have a better social integration (Sady et al., 2010).

The second aspect is physical impact. Marsh, Kersel, Havill, and Sleigh (2002) found that TBI patients may influence of family caregivers' physical health such as physical illness (6%) and a change in the sleeping pattern (60%). Moreover, TBI patients with persistent and high levels of disability require constant assistance. Consequently, family caregivers may experience physical fatigue and exhaustion (McPherson, Pentland, McNaughton as cited in Samartkit, Kasemkitvattana, Thosingha, & Vorapngsathorn, 2010).

The third one is impacts in family caregivers' functioning. Many researchers have documented disruptions or deprivations in family functioning as manifested by less of problem solving, communication, role functioning, affective involvement, affective responsiveness, behavioral control and effective coping (Curtis, Klemz, & Vanderploeg, 2000; Ergh et al., 2002; Gan & Schuler, 2002; Testa et al., 2006).

The last one is family burden (Aitken et al., 2009; Ganesalingam et al., 2007; Lethan, Arango-Lasprilla, de los Reyes, & Quijano, 2012; Nabors, Seacat, & Rosenthal, 2002). Ganesalingsam et al. (2007) found that post family caregivers have burden at three months post injury. Additionally, some family caregivers reported that their burden was caused loss of free time (Marsh et al., 2002).

Mild TBI Management in Indonesia

In Indonesia, the hospitals have guideline for mild TBI management. Mostly, the patients with mild TBI need hospitalization at least three days (Siswanto & Wahyu, 2012). The management of mild TBI patients during hospitalization are categorized in two parts, there non pharmacologic and pharmacologic. Non pharmacologic treatment included observation of GCS score, CT scan examination, monitor of increased intracranial pressure signs, vital signs, and neurologic signs every two hours, and laboratory examination. Pharmacologic treatment of mild TBI included providing medication such as analgesic, antipyretic, mannitol and sodium chloride fluid therapy, diuretic, and dexamethason. Before discharge, mild TBI patients receive medication such as analgetic, antipyretic, and neuro vitamin, and they should come to hospital one week after discharge (Siswanto & Wahyu, 2012).

Family Caregivers' Competencies in Caring for Patient with Mild TBI

Definition of Family Caregivers

Family caregivers refer to anyone who provides assistance and support to family members or acquaintances that have physical, psychological, or developmental needs (Family Caregiver Alliance, 2006). Family caregivers with TBI are defined as those people who are related to a head-injured individual and perform a major unpaid caregiving function (Sinnakaruppan, Downey, & Morrison, 2005). Family caregivers are defined as the individuals who would provide the majority of care (e.g., parent, guardian, significant other) for the patient with mild TBI after discharge.

Family caregivers play a central role in patient's rehabilitation with TBI after hospital discharge (Morris, 2001; Stejskal, 2008; Thorn, 2000) and reentry into the community (Stejskal, 2008). Family has responsibility in rehabilitation process such as providing care for patient and giving emotional support (Arango-Lasprilla et al., 2010).

Research indicates that family members carry the primary responsibility for post-acute caregiving, with as many as 80% of survivors returning home after their hospital and/or rehabilitation discharges (Brooks as cited in Stejskal, 2008). Families have responsibility to provide support, socialization and assistance to the injured person. Additionally, they help patients to facilitate the carryover of rehabilitation strategies to compensate for cognitive difficulties (Fleming, Shum, Strong, & Lightbody, 2005).

Family functioning is associated with progress in post-acute rehabilitation program Sander, Maestas, Shere, Malec, and Nakase-Richardson (2012). Sander et al. (2012) found that family caregivers with better emotional functioning were associated with greater social integration outcomes and occupation for mild to severe TBI persons who entered the post-acute rehabilitation program within 6 months of injury, but not for those more than 6 months post-injury. Healthy family functioning was predictive of greater home integration (Sady et al., 2010). Additionally, patients performed better in rehabilitation with support from the family caregivers than those who do not receive support from their family caregivers (Sady et al., 2010; Sander et al., 2012). A person who received greater social support from caregiver was associated with better outcomes in productivity and social integration (Sady et al., 2010).

Family Caregivers' Competencies in Caring for Mild TBI Patients

Definition of family caregivers' competency. Competency is defined as the ability to do something successfully or efficiently or the capability of applying or using knowledge, skills, abilities, behaviors, and personal characteristics to successfully perform critical work tasks, specific functions, or operate in a given role or position (Lucia & Lespinger as cited in Ennis, 2008). The elements of competency include knowledge, skills and abilities, as well as soft skills or behaviors (Rodriguez, Patel, Gregory, & Gowing, 2002).

Family caregiver's competencies are the family caregiver's ability to perform the necessary tasks of organizing and managing itself as it accomplishes family tasks (Beavers & Hampson, 2003) or the effective performance of caregiving actions that are associated with the care recipient's safety and related knowledge and skills (Horvath et al., 2005). Family caregivers' competencies measure the family's ability, to communicate, coordinate, negotiate, establish clear roles and goals, problem solve, adapt to new situations, accept responsibility, be autonomous, and believe in itself (Beavers & Hampson, 20003). The family caregivers' competencies relate to the structure, function and flexibility of a family system, i.e. how a family negotiates and functions in everyday and stressful situations, the communication patterns of the family, parent/child roles, goal-direction of the family, autonomy of each individual, and family affect.

Family caregivers' competencies in caring for mild TBI patients.

Family caregivers have responsibility to help the patients with mild TBI by providing care earlier after discharge from hospital until thirty days (DVA/DoD, 2009). The aims of caring for patient following mild TBI are to prevent the persistent symptoms

and complications of mild TBI like increased intracranial pressure (IICP) (DVA/DoD, 2009). Family caregivers' competencies to provide care for patients include patients' symptoms, patients' symptoms management, and patients' symptom evaluation (DVA/DoD, 2009).

1. Patients' Symptom Assessment. Family caregivers' competencies in patient's symptom assessment refer to family caregivers' ability to assess the warning signs and symptoms related to IICP and the patients' symptom after being discharged. Monitoring of intracranial pressure (ICP) is important to recognize impending complications or worsening of intracranial pathology (Imhof & Lenzlinger, 2011). Regarding to clinical practice guideline for management of mild TBI/concussion, the assessment of patients' symptoms can be grouped into three categories: physical, cognitive, and emotional or affective symptom (DVA/DoD, 2009). Documenting frequency and severity of patient's symptoms is important to set a baseline for monitoring subsequent symptom management. Additionally, family caregivers can assess about the kind of patient's symptoms, duration of patient's symptom, onset and triggers, location, intensity and impacts, and warning signs and symptoms (Heng et al., 2007). In symptom assessment, family caregivers can use the patient's symptom checklists (DVA/DoD, 2009).

2. Patient's symptom management. After the screening and assessment of mild TBI symptoms, family caregivers can provide cares to the patient by the using symptom management (DVA/DoD, 2009). For managing the warning signs, family caregivers should bring the patient directly to the hospital. Another one is symptom management following mild TBI patient. Symptom managements focus on initial management of the physical, cognitive, and emotional symptoms. Symptom

managements consist of two managements: non pharmacological and pharmacological (American Association of Neuroscience Nurses/AANN & Association of Rehabilitation Nurses/ARN, 2011; DVA/DoD, 2009). In symptoms management include management of physical symptoms, cognitive symptoms, and emotional symptoms.

2.1. Physical symptoms management. In management of physical symptoms include (1) headache symptom management, (2) dizziness symptom management, and (3) fatigue symptom management.

1). Headache management. Non pharmacological managements for headache are relaxation technique like a deep breathing, a review of postures and an adjustment to ensure neck and spine be in a neutral position, series of neck exercises and appropriate ranges of motions, massage therapy to help with headache from neck tension (DVA/DoD, 2009), and regular exercise (American Association of Neuroscience Nurses [AANN & ARN], 2011; DVA/DoD, 2009). Neck exercise was effective to reduce or prevent a headache following a mild TBI (Ylinen, Nikander, Nykanen, Kautiainen, & Hakkinen, 2009) that consisted three exercises, there are flexion, lateral flexion, and rotation (DVA/DoD, 2009). Additionally, the management of headache includes maintaining regular meal schedule; maintaining adequate hydration; minimizing stress, and sleep hygiene (DVA/DoD, 2009). Sleep hygiene significant decrease of headache pain (Ruff, Ruff, & Wang, 2009). While pharmacological treatment for headache consists of treatment for migraine and tension type. Family caregivers have responsibility to remind the patients in taking medications to relieve or reduce headache (AANN & ARN, 2011). Pharmacological treatment for migraine used Triptans (rizatriptan, eletriptan and

almotriptan)antiemetics; ergotamines; and dihydroergotamines (HCS, 2004).

Medication of tension-type headache used non-narcotic medications for acute headaches used periodically to prevent rebound headaches, Tricyclic antidepressants, muscle relaxants, indomethacin trial; limit non-steroidal anti-inflammatory drugs [NSAIDs] for chronic headaches (HCS, 2004).

2). Dizziness management. Non pharmacological managements for dizziness are neck stretching, changing position slowly, and performing vestibular rehabilitation exercise (DCoE, 2012). The vestibular rehabilitation could decrease dizziness and improve gait and balance function after concussion (Alsalaheen et al., 2011; Gottshall, 2011). The vestibular rehabilitation included turning the head from side to side, standing balance, walking with balance challenge (Alsalaheen et al., 2011). The steps of turning the head from side to side are sitting upright on the bed, turning head to the left, lying back, turning head to the right, rolling over to the right side, and sitting up straight (DVA/DoD, 2009). Pharmacological therapy for dizziness includes Meclizine, Dimenhydramin, Lorazepam (DCoE, 2012).

3). Fatigue management. Non pharmacological management for reduce fatigue includes regular exercises (AANN & ARN, 2011; DVA/DoD, 2009), sleep hygiene, and well balanced meal (DVA/DoD, 2009). Family caregivers should encourage restructuring the timing of daily activities to minimize its deleterious effects. Activities and rest required the most effort should be scheduled at a time. Sleep hygiene includes maintaining regular bedtime and awakening schedules, establishing usual bedtime routine; sleep in quiet, dark, cool room; avoiding the consumptions of caffeine, stimulants, smoking, and alcohol prior to bed; if unable to sleep after 15 minutes in bed, rise and go to another room until sleepiness returns

(Siebern & Manber, 2010). According to De Groot , Phillips, and Eskes (2003) some patients have found that the scheduling of regular naps or rest periods can reduce fatigue. In addition, family can teach patients like distraction, this technique is beneficial to reduce fatigue by reducing stress (Portenoy & Itri as cited in De Groot et al., 2003). Pharmacological treatment includes psycho stimulants such as Methylphenidate and Modafinil, dopaminergic like Levodopa and Bromocriptine, cholinesterase inhibitors such as Donepezil (Anderson, Heitger, & Macleod, 2006).

2.2. Cognitive symptom management. In cognitive symptom management in term management of memory difficulties include practicing memory skills about place, time, and person by asking directly or using memory aids such as memory books or calendars, electronic memory aids (e.g., personal digital assistants); and making daily planners (Tsaousides & Gordon, 2009). Pharmacologic management includes the use of cholinesterase inhibitors (donepezil) for memory, attention, and monitoring the effects of stimulant medications as may exacerbate post-concussion symptom (PCS). Other medications for cognitive impairments are catecholaminergic augmentation and cholinergic augmentation (Arciniegas & Silver, 2006). Methylphenidate augments cerebral catecholaminergic function and is the first-line treatment for impaired speed of processing; it may also improve arousal and, to a lesser extent, attention and memory (Warden et al., 2006).

2.3. Emotional symptom management. In management of emotional symptoms including keeping safe, reducing noise, leaving the person for short period when warning signs of anger develop in safety condition, using relaxation technique (sitting, closing eyes, deep controlled breathing) are important. Warning signs include verbal (high voice, cursing, threats), behavioral (making fists, increase movement,

angry face, breaking or throwing things, hitting, kicking or other forms of violence), physiological (sweating, fast breathing, bulging eyes) (Tsaousides & Gordon, 2009).

3. Patient's Symptoms Evaluation. Competency of family caregivers on symptom evaluation is family ability to evaluate or follow-up or re-assessment of symptom after they provided care to the patient with mild TBI. The patients should be followed up in four weeks to confirm resolution of symptoms and to address any concerns of providing care (DVA/DoD, 2009). Evaluation after the providing care is important to determine patient status. Family caregivers can evaluate about patient's recovery from acute symptoms, either improving or not or status getting worsens (DVA/DoD, 2009). If patient's symptoms are getting worse or significantly impact in daily activities, family caregivers should bring the patient to the hospital or health care providers (DVA/DoD, 2009).

In summary, family caregivers' competencies in caring for patients with mild TBI include ability to assessing warning signs and symptoms following-up mild TBI, managing of mild TBI symptoms, and evaluating of mild TBI symptom after providing management symptoms.

Factors Contributing to Family Caregivers' Competencies

There are some factors contributing to family caregivers' competencies in caring for patients that are divided in two factors: internal and external factors.

Internal factors. The internal factors include psychological status, physical health, experience, education level, self-efficacy, employment, and knowledge and skills.

Psychological status. Psychological status such as stress and anxiety could influence family caregivers' competencies in caring for their patients. Ostberg & Hagekull (2000) reported that stress and depression are significantly related to the parent's competencies. Similarly, distress can influence family function to take care of the patients with traumatic brain injury (Testa et al., 2006). In addition, Backhaus, Ibarra, Klyce, and Trexler (2010) found that family caregivers' distress may influence their self-efficacy.

Physical health. The family caregivers' health had a relationship on their caregiving. Samartkit et al. (2010) found that family caregivers who had a good physical health would provide a good care for their patients. However, one study mentioned that caregivers' physical health was not associated with family functioning in their caring for patients (Clark et al., 2004).

Experience. Prior experience of providing care for patients can influence current family competencies (Horvath et al., 2005). Moreover, family caregivers who never had experience in caring for their patients, they had lower skill levels (Farran et al., 2011)).

Education level. The family education level influences their competencies in providing care to the patients. Farran et al (2011) found that education level can influence family's skill in caring for patient with Alzheimer, family caregivers with high school or less of education had lower skill level than the family caregivers that were college graduates or beyond.

Self-efficacy. Self-efficacy influenced family caregivers' performance (Kouri et al., 2011). Self-efficacy is individuals' belief or confidence in performing a specific task or activity (Bandura, 1997). The family caregivers who have high self-

efficacy or confidence are better in their performance in caring for patients (Kouri et al., 2011). Family caregivers who have a positive perception of their abilities to implement caregiving successfully have more positive performance regarding their role (Narayan, Lewts, Tornatore, Hepburn, Corcora-Perry as cited in Samartkit et al., 2010).

Employment. Family caregivers who had working may influence in their competencies in term caregiving roles for patients (Wang, Shyu, Chen, & Yang, 2010). Family caregivers with full time jobs significantly more role strain than family caregivers working in part time or unemployed (Wang et al., 2010). Employed family caregivers had been limited to the care responsibility, they were more likely to stop caregiving than to give up work (Dautzenberg, Philipsen, Stevens, & Vernooij-Dassen as cited in Wang et al., 2010). In contrast, Bullock, Crawford, and Tennstedt (2003) found that employed family caregivers did not provide significantly less care than unemployed family caregivers.

Knowledge and skills. Knowledge and skills are also important factors that have contribution in family caregivers' competencies in caring for patients. The basic knowledge provides the foundation for improving skills (Given, Given, & Sherwood, 2008). According to Utami (2012), the family caregivers who have sufficient knowledge and skills may influence their competencies in term of confidence (Utami, 2012) and abilities to provide care in caring for patients (Kouri et al., 2011).

External factors. The external factors include professionals' support, education program, and patients' symptoms.

Professionals' support. Support from health care professionals such as nurses and physicians may contribute on family caregivers' competencies in caring for patients. Providing information from health care professionals improved family caregivers' knowledge and competencies (Lefebvre, Pelchat, Swaine, Gelinias, & Levert, 2005). Lack of psychological support and information from health care providers may influence family caregivers' knowledge, skills, and sense of ability in their caregiving for patients with TBI (Lefebvre et al., 2005).

Education program. Education program means providing knowledge and skills to the family caregivers. Education program can increase family caregivers' knowledge and skills. Shocker (2008) provided education program for family caregivers with moderate and severe TBI, the findings showed that their knowledge was significantly improved. Moreover, education program may increase family caregivers' skills in caring for their relatives. Kouri et al. (2011) found that education program could improve family caregivers' skills. In addition, education program may enhance family caregivers' self-efficacy in caring for patients with TBI (Backhaus et al., 2010; Sinnakaruppan et al., 2005; Utami, 2012).

Patients' symptoms. Patients' symptoms could influence the family caregivers' performance in their caring for patients with traumatic brain injury. Anderson, Parmenter, and Mok (2002) showed that the greater of patients' symptoms was related to the amount of care. In addition, neurobehavioral symptoms may influence on family caregivers' functioning (Anderson, Simpson, & Morey, 2012).

Education Program for Family Caregivers

Education Program

Education program in this study uses term of health educational term. Health education is any combination planned learning experiences based on sound theories that provide individuals, group, and communities the opportunity to acquire information and the skills needed to make quality health decisions (Joint Committee, as cited in Cottrell, Girvan, & McKenzie, 2009). Health education consists of three components. There is the using of teaching-learning strategies, learners maintain voluntary control over the decision to make changes in their actions, and behavior changes that have been found to improve health status (Edelman & Mandle, 2010).

Edelman and Mandle (2010) explained that health education facilitates the development of health knowledge, skills and attitudes through the application of theories or models. Generally, health education programs help families are satisfied and have received the health care that is most relevant to their problems. Health education is a tool or mechanism for health-related learning resulting in increased knowledge, skill development, and change in behavior. Knowledge gained to empower individuals and to promote change in the environment and society for better health (Maville & Huerta, 2002).

The aim of education is to help family achieve optimal states of health through their own actions and initiative (Anderson, Ward, and Hatton as cited in Edelman & Mandle, 2010). Health education encourage positive or empowerment to the family, thus family who believe that they can make different in health and make changes (Anderson et al as cited in Edelman & Mandle, 2010). Family health

education can improve family's self-concept, increased self-esteem, achieving developmental task, better family functioning, and adaptation to change in family situation or life state (Edelman & Mandle, 2010).

According to Edelman and Mandle (2010) three domains in education program include cognitive, psychomotor, and affective were explained. Cognitive domain refers to the development of new facts or concept, and building on or applying knowledge to new situation (Edelman & Mandle, 2010). Shocker (2008) measured the level of knowledge. Psychomotor domain involves developing skill (Edelman & Mandle, 2010). Affective learning related to the recognition values, family interaction patterns and relationships, and personal attitudes that affect decisions and problem solving progress (Edelman & Mandle, 2010).

Self-Efficacy in Education Program

Self-efficacy is a psychological construct based on social cognitive theory which describes the interaction between personal, behavioral, and environmental aspects in health and chronic disease. Self-efficacy is one's self-judgmental of personal capabilities to initiate and successfully perform a specified task at designated levels, one expends greater effort, and perseveres in the face of adversity (Bandura, 1997). According to Bandura (1989), self-efficacy beliefs affect thought patterns in which it can be self-aiding or self-hindering. The strength of person's conviction in her or his own capabilities is likely to affect whether they will attempt to cope with a given situation (Bandura, 1997).

Based on the Bandura's theory, self-efficacy makes a difference in how people feel, think, and act. In terms of feeling, a low sense of self-efficacy is

related to depression, helplessness and anxiety. Persons with low self-efficacy have low self-esteem and they have pessimistic thoughts about their personal development and accomplishment. In terms of thinking, a strong sense of competence facilitates cognitive process and performance in a variety of settings including quality of academic achievement and decision-making. Self-efficacy has an influence on preparing action because self-efficacy self-related cognitions are a major ingredient in the motivation process. Self-efficacy levels can increase or inhibit motivation. People with high self-efficacy choose to perform more challenging task (Bandura, 1997).

Self-efficacy beliefs are constructed from four sources of information. There are enactive mastery experiences that serve as indicators of capability, vicarious experiences that alter efficacy beliefs through transmission of competencies with attainment of others, verbal persuasion, and physiological and affective states (Bandura, 1997).

Enactive mastery experiences. This is the most influential sources of efficacy information because they provide the most authentic evidence of whether one can muster whatever it takes to succeed (Bandura, 1997). Successes make a strength belief in personal efficacy. Enactive mastery produces stronger and more generalized efficacy beliefs than do modes of influence relying solely on vicarious experiences, cognitive simulation, or verbal instruction. Building a sense of personal efficacy through mastery experiences is not matter of programming ready-made behavior. It involves acquiring the cognitive, behavioral, and self-regulatory tools for creating and executing effective courses of action to manage ever-changing life circumstances. The development of efficacy beliefs through enactive experience creates the cognitive

and self-regulative facility for effective performance. Development of the cognitive basis of human competencies is facilitated by easily mastered skills (Bandura, 1997).

Vicarious experiences. Bandura (1997) explain that vicarious experiences refer to the symbolic modeling of the successful performance against the challenging activities or frightening. Modeling serves as another effective tool for promoting a sense of personal efficacy. The modeling situation is construed as an opportunity to develop one's knowledge and skills through the aid of proficient models. Additionally, modeling by seeing or visualizing people similar to oneself perform successfully typically raises efficacy beliefs in observers that themselves possess the capabilities to master comparable activities. Moreover, by seeing oneself perform successfully can enhance proficiency. It provides clear information on how best to perform skills and it strengthens beliefs in one's capability. Another prevalent source of vicarious influence is the varied symbolic modeling provided by television and other visual media. The accelerated growth of video technologies has vastly expanded the range of models to which people are exposed day in and day out (Bandura, 1997).

Verbal persuasion. Verbal persuasion serves as a further means of strengthening people's beliefs that they possess the capabilities to get what they seek (Bandura, 1997). It uses suggestion, self-instruction, exhortation, and interpretive treatment to encourage people. Verbal persuasion is most likely to be effective when used in conjunction with mastery and modeling experiences than when used alone. People who are persuaded verbally that they possess the capabilities to master given tasks are likely to mobilize greater effort and sustain it than they have self-doubts and dwell on personal deficiencies when troubles arise (Bandura, 1997). To the extent that

persuasive boosts in perceived efficacy lead people to try for success, they promote the development of a sense of personal efficacy and skills. Positive persuasion enhances self-efficacy and negative persuasion decreases self-efficacy.

Physiological and affective states. The last source of efficacy beliefs is somatic information generated by a person's behavior, situation, or affect (Bandura, 1997). Bandura has recorded high physiological and affective states that can influence individual performance to achieve success. People are more likely to expect failure when they are very tense and nervous. For example, if an activity requires physical exertion but the person quickly feels fatigue, aches, and pains, then he or she will likely feel inefficacious about that activity. Somatic indicators of personal efficacy are especially relevant to involve physical accomplishment, coping with stress or, and health functioning. A person's affect or mood can also impact self-efficacy by biasing a person's attention to an event, how the person interprets the event and how the person organizes and then retrieves the event from memory. Mood gives an additional source of affective information for judging personal efficacy because they often accompany changes in the quality of functioning (Bandura, 1997). Enhancing perceived self-efficacy can induce positive mood (Forgas, Bower, & Moylan as cited in Bandura, 1997). Moreover, another way of modifying self-beliefs of efficacy is to increase physical status, reduce level of stress and negative emotional, and correct misinterpretation.

In conclusion, self-efficacy is fundamental to competent performance. Self-efficacy can be enhanced by using four sources of information; enactive mastery experiences, vicarious experiences, verbal persuasion, and psychological and affective

states. As a result, if people have a high level of self-efficacy they are more likely to perform caring for patients with mild TBI.

The Existing Education Program for Family Caregivers with TBI

Several published experimental studies were reviewed to determine the existing study about education program on family caregivers with TBI. It varied in terms of target population, settings, teaching strategies, educations' materials, contents of education program, duration of intervention, follow-up, and outcomes.

Target population. The target population for education program was family caregivers include parent, spouse, adult child, sibling, partner, friend, and other relatives. For criteria of patients, five studies conducted in patient with mild to severe TBI (Albert, Im, Brenner, Smith, & Waxman, 2002; Kreutzer et al., 2009; Morris, 2001; Sinnakaruppan et al., 2005), moderate to severe TBI (Backhaus et al., 2010; Carnevale, Anselmi, Busichio, & Millis, 2002; Rivera, Elliot, Berry, & Grant, 2008; Rodgers et al., 2007; Shocker, 2008;), and only one study was conducted in patient with mild TBI (Utami, 2012).

Settings. Rehabilitation setting is the most places that used to provide intervention. Two studies were conducted in the community (Albert et al., 2002; Rivera et al., 2008). Mostly interventions were conducted in family caregiver with patient who already discharged from hospital ranged from two months until one year. Two studies were conducted in the hospital before discharged (Shocker, 2008; Utami, 2012).

Teaching strategies. The teaching strategies of interventions were classified into deductive (researcher provide learning material through educational

sessions and might be followed by discussion); practice required skills; problem solving, psychological support, and written information. Most of the studies combined several methods in their education program. Two studies used deductive strategies (Shocker, 2008; Utami, 2012) and study used deductive strategies with practice (Sinnakaruppan et al., 2005). One study used written information (Morris, 2001). Four studies employed a combination education, problem solving, and stress management (Albert, 2002; Backhaus et al., 2010; Carnevale et al., 2002; Kreutzer et al., 2009; Rivera et al., 2008; Rodgers et al., 2007). Mostly, education program was conducted face-to-face with family caregiver. One study used telephone to provide education (Albert et al., 2002). Moreover, educational program was provided in group (Backhaus et al, 2010; Carnevale et al., 2002; Kreutzer et al., 2009; Sinnakaruppan et al., 2005; Rodgers et al., 2007) or individual (Albert et al., 2002; Morris,2001; Rivera et al., 2008; Shocker, 2008; Utami, 2012).

Education materials. During education program, family caregivers received booklet/pamphlet (Morris, 2001, Rivera et al., 2008; Utami, 2012), handout (Backhaus et al., 2010; Kreutzer et al., 2008; Rodgers et al., 2007; Sinnakaruppan et al., 2005; Carnevale et al, 2002). Two studies did not provide materials for family caregivers (Albert et al., 2002; Shocker, 2008).

Content of education program. The content of the educational session focused on brain injury (Albert et al., 2002; Backhaus et al., 2010; Carnevale et al, 2002; Morris, 2001; Rodgers et al., 2007; Shocker, 2008; Sinnakaruppan et al., 2005; Utami, 2012), neurobehavioral consequences of traumatic brain injury, physical and psychological symptoms of TBI (Albert et al., 2002; Kreutzer et al., 2008; Morris, 2001; Shocker, 2008; Sinnakaruppan et al., 2005; Utami, 2012), medical complication

(Rodgers et al., 2007; Utami, 2012), medication (Utami, 2012), and rehabilitation or recovery (Albert et al., 2002; Kreutzer et al., 2008; Morris, 2001; Rodgers et al., 2007).

Duration of intervention. The duration of the intervention is measured using the length of intervention period, from the baseline assessment until the completion of the program. The duration of intervention can be divided in three categories: short-term (less than six months or 24 weeks) and long-term (six months and more than six months). Three studies were conducted in short-term; one day (Shocker, 2008; Utami, 2012), 4 weeks (Morris, 2001), 10 weeks (Kreutzer et al., 2009), 12 weeks (Backhaus et al., 2010; Sinnakaruppan et al., 2005), 14 weeks (Carnevale et al., 2002). Three studies were conducted in long-term; 6 months (Albert et al., 2002); 1 year (Rivera, 2008), and 12-18 months (Rodgers et al., 2007).

Follow-up. The follow-up consists of two items: method and timing. Commonly, the methods of follow-up used telephone call (Albert et al., 2002; Morris, 2001; Rivera et al., 2008) and face-to-face (Kreutzer et al., 2009; Rivera et al., 2008; Rodgers et al., 2007; Sinnakaruppan et al., 2005). The time of follow up performed after intervention approximately 1 month (Morris, 2001), 3 months (Backhaus et al., 2010; Kreutzer et al., 2009; Sinnakaruppan et al., 2005), 6 months (Albert et al., 2002), and more than 6 months (Rivera et al., 2008; Rodgers et al., 2007). Two studies did not provide follow-up (Shocker, 2008; Utami, 2012).

Outcomes. The major results after following education programs are reducing distress, depression, and anxiety (Albert et al., 2002; Backhaus et al., 2010; Carnevale et al., 2002; Kreutzer et al., 2009; Morris, 2001; Rodgers et al., 2006; Rivera et al., 2008; Shocker, 2008; Sinnakaruppan et al., 2005). Other outcomes were

reducing family's burden (Albert et al., 2002; Rodgers et al., 2006), increasing level of knowledge (Shocker, 2008), improving caregivers' satisfaction (Albert et al., 2002), and increasing of self-efficacy (Backhaus et al., 2010; Sinnakaruppan et al., 2005; Utami, 2012). Additionally, education for family caregivers may help family caregivers to increase in met family needs, perceived access to services (Kreutzer et al., 2009) and support from health care professionals (Albert et al., 2002). Only one study concerned to improve family competence (Albert et al., 2002). The outcomes of these studies were measured at different periods of time, such as immediately after program (Shocker, 2008; Utami, 2012), 1 week after the program (Morris, 2001), 5 weeks (Carnevale et al., 2002), 3 months (Backhaus et al., 2010; Kreutzer et al., 2009; Sinnakaruppan et al., 2005), 6 months (Albert et al., 2002), and 1 year (Rodgers et al., 2006; Rivera et al., 2008).

There is one study that is concerned with an education program on family caregivers' competencies in caring for patients with mild TBI. Utami (2012) conducted a quasi-experiment study that aimed to examine the effect of health education on family caregivers' self-efficacy and desires in caring for mild TBI patients. The researcher provided an education program for forty nine family caregivers (23 family caregivers of the control group and 26 family caregivers of the experimental group) with mild TBI in the emergency department. The contents of the program included signs and symptoms of warning signs, diet, activity and rest, medication, and post-concussion symptoms. The family caregivers' self-efficacy and desires were directly measured twice at pre and post intervention. This study did not mention about the underlying theory of the program, the duration of the program, and did not apply a follow-up. The findings showed the mean score of self-efficacy was

significantly higher than before receiving the program. However, the family caregivers' desires for caring for their patients with mild TBI were significantly increased in both groups. The mean of the self-efficacy of the experimental group was significantly higher than of the control group. In addition, the results of the family caregivers' desires of the experimental group were significantly different between the groups ($p < .05$).

Apart from the studies listed above, there are two studies that concern about education program on family competency in different population. The first one is a study by Srijumnong (2010). The quasi-experimental study aimed to know the effect of self-efficacy promotion program for thirty family caregivers of people with stroke at home on their perceived self-efficacy, outcome expectation of care, and satisfaction with the program. This study was conducted based on Bandura's Self-Efficacy Theory included training the family caregivers before the patients were discharge until eighth week after discharge. The researcher applied the home visit, counseling, and giving advice in person and by telephone. The contents of program were expressing about family caregiver's opinion regarding caring benefits known or encountered in caring experiences, lecturing, watching VCD on caring for persons with stroke, teaching and demonstration. Then, the researcher conducted followed-up in the first, second, fourth, and sixth week after discharge. The measurement of self-efficacy used tools that consisted of 19 items and the measurement of outcome expectation used fourteen items. The result of this study showed significantly higher perceived self-efficacy and outcome expectation of family caregiver's care at the sixth and eight week than before the program began.

The second one is a study by Kouri, Ducharme, and Giroux (2011) who conducted the educational intervention to support family caregivers with Alzheimer's disease based on Bandura's Self-efficacy Theory. The researchers used four sources from Bandura (1997) in their program such as demonstration and re-demonstration about communication skills, sharing with the subjects, explore feeling to reduce fears and anxieties. The duration of education was two hours. The researchers used the Caregiver Self-efficacy Scale from Bandura to measure family caregivers' self-efficacy and the Communication Skills Questionnaire to measure family caregivers' performance in communication with the patients. The findings showed statistically significant on family caregivers' self-efficacy and skills.

Summary

To sum up, the literature review of this study provides fundamental of knowledge for the development of self-efficacy enhancing education program to improve family caregivers' competencies in term perceived confidence and performance in caring for patients with mild TBI in Indonesia. Mild TBI is an acute brain injury resulted from external mechanical force to the head that had at least one characteristic such as GCS score 13-15 at 30 minute after injury, post traumatic amnesia less than 24 hours, duration of loss of consciousness for 30 minute or less, no focal neurology deficit and normal neuro imaging. Patients' symptoms experienced after mild TBI can be categorized as physical, cognitive, and emotional/affective symptoms. There are three family caregivers' competencies in caring for patients with mild TBI, namely assessing warning signs and patients' symptoms after mild TBI,

managing patients' symptoms, and evaluating patients' symptoms after providing care. There are several factors can influence the family caregivers' competencies in caring for patients with mild TBI, either personal or external factors.

Several studies were reviewed to determine the existing study about education program on family caregivers with TBI. The program used combination methods to provide information for family caregivers and mostly education program was given after the patients were discharge from hospital, only two studies were conducted during the hospitalization. Mostly, the outcomes of previous studies showed reduce emotional problem. Three studies had outcome to increase family caregiver's self-efficacy. But all of these studies did not measure the family caregivers' competencies in term family caregivers' performance or skill. There were two studies in different population that conducted education program based on self-efficacy from Bandura. These studies measured family caregivers' self-efficacy and one of these studies measured about family caregivers' skill or performance. Therefore, in this present study, researcher would like to conduct a self-efficacy enhancing education program on family caregivers' competencies in caring for patients with mild TBI in Indonesia.

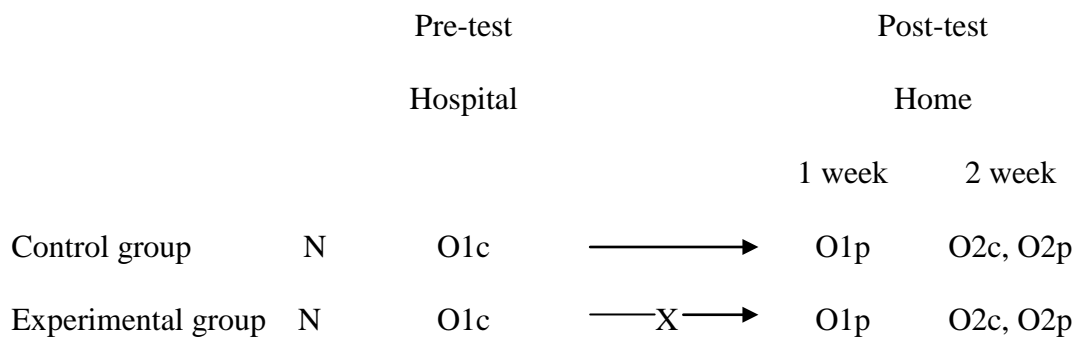
CHAPTER 3

RESEARCH METHODOLOGY

This chapter presents the design, variables, setting, population and sample, sampling procedure, research instruments, validity and reliability of the instruments, translation of instruments, ethical consideration, data collection methods, and data analysis.

Research Design

This study was a quasi-experimental study, two groups pre-test and post-test design with a non equivalent control group. It was conducted to examine the effect of a self-efficacy enhancing education program on family caregivers' competencies in caring for patients with mild TBI. The control group received routine care and the experimental group received both the self-efficacy enhancing education program and routine care. The research design was as follows:



O1c : refers to the baseline data (pre-test score) of family caregivers' competencies (perceived confidence)

- X : refers to a self-efficacy enhancing education program
- N : non equivalent/ non randomization
- O2c : refers to post-test score of family caregivers' competencies (perceived confidence)
- O1p : refers to the first post-test score of family caregivers' competencies (performance) after receiving a self-efficacy enhancing education program at the first week after discharge
- O2p : refers to the second post-test score of family caregivers' competencies (performance) after receiving a self-efficacy enhancing education program at the second week after discharge

Variables

The independent variable in this study was the self-efficacy enhancing education program. The dependent variables were family caregivers' competencies (perceived confidence and performance) in caring for patients with mild TBI.

Setting

This study was conducted in a surgical ward of PKU Muhammadiyah Yogyakarta and PKU Muhammadiyah Bantul Hospital, Yogyakarta, Indonesia. Both hospitals are referral hospitals in which received all patients from various regions in Yogyakarta Province. These hospitals have been standardized by the Ministry of Health Republic Indonesia as a level B of accreditation. In addition, these hospitals

are located in the centre of the city and have comprehensive facilities like a Computed Tomography (CT) scan, so patients and their family caregivers have easy access.

Population and Sample

Population

The population of this study was the family caregivers of patients with mild TBI who were admitted to the target hospitals during the study period.

Sample Size

The sample size estimation of the study was based on a power analysis by using the effect size (d), as calculated from a previous study by Srijumnong (2010). It was conducted on the effect of a self-efficacy promotion program for family caregivers of persons with a stroke. The researcher identified the sample size using power analysis (Appendix A). The calculation of the effect size was 1.03. Since this study is conducted in a different population the effect size of 0.8 was used as a large effect size to calculate the sample size. According to Polit and Beck (2008) to achieve alpha ($\alpha = .05$), power ($p = .80$), and effect size ($d = 0.80$), at least 25 subjects were required per group (experimental and control group) or a total of 50 subjects.

Inclusion Criteria

The sample of this study was selected using the inclusion criteria for the family caregiver as follows: (1) age ≥ 17 years - 70 years, (2) had the first time experience in caring for patients with mild TBI, (3) who were identified by patients

that they had the primary responsibility in providing care for them, (4) lived with the mild TBI patient, (5) did not have any history of psychiatric disorders, physical problems, and hearing problems, (6) were able to communicate in the Indonesian language both verbally and in writing, (7) had access to telephone contact, and (8) consent to participate in the study either verbally or with written consent. Moreover, the inclusions criteria for patients were (1) persons with a mild TBI who have been diagnosed by a doctor, and (2) age ≥ 17 years old.

Sampling Procedure

The sample of the present study was taken from the surgical ward of two hospitals. The subjects who met the inclusion criteria were approached by a nurse. They were approached to ascertain his/her willingness to participate in the study. Then, the researcher assigned first the 25 family caregivers in the control group. After the control group was filled with the correct number of subjects, the researcher placed the 25 family caregivers in the experimental group.

Instrumentation

There are two parts of instruments that were used in this study, part one was a self-efficacy enhancing education program and part two were the data collection instruments, including the demographic data form, and the family competencies questionnaire (Perceived Confidence Questionnaire and Performance Questionnaire). Each part of the instrument was described as follows:

Part I: Self-Efficacy Enhancing Education Program

The self-efficacy enhancing education program was developed by the researcher based on self-efficacy by Bandura (1997), the content of the education program and literature review about family caregivers' competencies in caring for a patient with mild TBI. This program covered the four domains of self-efficacy sources; verbal persuasion, vicarious experience, mastery experiences, and physiological, affective states, and conducted weekly telephone follow-up (Appendix I). This program was conducted over two weeks. The description of the program was as follows:

During hospitalization, the researcher conducted individual a self-efficacy enhancing education programs and family caregivers received intervention sessions as follows: (1) exploring feelings before the education program; (2) a teaching session which included definition of mild TBI, symptoms assessment, symptoms management, and symptoms evaluation, and providing reinforcement and support; (3) demonstration and re-demonstration of the assessment of symptoms using a symptom checklist; 4) sharing information about successfully of mild TBI management and showing the pictures about management of symptoms: neck stretching, sleeping position, and vestibular exercise (Appendix J). During this session, family caregivers received the management of mild TBI booklet (Appendix K). The content of the booklet included a definition of mild TBI, the symptoms following mild TBI, warning signs, symptoms checklist, and the management of symptoms. These sessions take about 60 minutes.

The first week after discharge, (5) the researcher then conducted a telephone follow-up in order to evaluate the competencies during implementation of

the programs. In this session, the researcher asked the family caregiver; a progress report related to performance in caring for the patient with mild TBI at home, the concerns or worries were providing care for the patient with mild TBI and provided information related to family caregivers' concerns, reinforcement for any success of the family caregiver to assess symptoms, manage symptoms, and evaluate symptom of mild TBI, evaluated the family caregivers' performance related to symptoms assessment, symptoms management, and symptoms evaluation using the PQ, provided support to the family caregivers related to their performance in caring for patients with mild TBI. The second week after discharge, and (6) the researcher conducted activities that similar to the first week.

Part II: Data Collection Instruments

Demographic Data Questionnaire (DDQ). The DDQ consists of Family Caregivers Demographic Data Questionnaire (FDDQ), Patient Demographic Data Questionnaire (PDDQ), and Injury Characteristics (IC). The FDDQ (Appendix C) and PDDQ (appendix D) were used to collect the patient's and family caregiver's data. Data about the family caregivers included age, gender, marital status, religion, educational level, and occupation. The FDDQ and PDDQ form were completed by the family caregivers before the education program began. The IC (Appendix E) was used to collect the patient's injury characteristics. This information was obtained from medical records as well as in an interview format with the patient and his or her family members; the date of the injury, etiology, GCS score admission, CT scan, other injuries, and duration of hospitalization.

The Rivermead Post-concussion Symptom Questionnaire (RPSQ).

The RPQ was developed by King, Crawford, Wenden, Moss, and Wade (1995). This RPQ (Appendix F) was used to assess the number of symptoms of patients who sustain a concussion/mild TBI. It includes physical, cognitive, and emotional symptoms and is composed of 15 items list of symptoms, using yes/no answers. The total score ranges from 0 to 15. A higher score implies the number of patient's symptoms.

The Perceived Confidence Questionnaire (PCQ). This instrument was developed by the researcher. It was used to measure the family caregivers' confidence regarding care for the patient with a mild TBI and consists of three domains; the confidence of the family caregiver to assess warning signs and four common symptoms of mild TBI, the confidence of family caregiver to manage the warning signs and four common symptoms, and the confidence of the family caregiver to evaluate the four symptoms (Appendix G). This questionnaire consists of 23 items and uses a 4-point Likert scale that was scored from 1 to 4; no confidence = 1, low confidence = 2, moderate confidence = 3, and high confidence = 4. The total perceived confidence score ranges from 23 to 92. A higher score implies a higher level of perceived confidence of family caregiver.

The Performance Questionnaire (PQ). This instrument was developed by the researcher. It is used to measure the family caregivers' performance regarding care for a patient with mild TBI and consists of three domains; the performance of the family caregiver to assess the four symptoms of a mild TBI, the performance of family caregiver to manage symptoms, and the performance of the family caregiver to evaluate symptoms (Appendix H). This questionnaire consists of

three parts. Part I, family caregivers were asked about warning signs and symptom following the mild TBI that occurred in the patients. Part II measured family caregivers' performance related to symptoms assessment, symptoms management and symptoms evaluation. Part III is an addition statement that asked family caregivers action if patients have warning signs and symptom following mild TBI. This questionnaire consists of nineteen statements using a 5-point Likert scale that is scored from 1 to 5; never = 1, rarely= 2, sometimes = 3, often = 4, and regularly= 5. The performance of the symptoms assessment consists of four statements about the family caregivers' performance to assess the four common symptoms. The total performance score ranges from 19 to 95. A higher score of performance regarding care for patients with mild TBI indicates a high level of family caregiver's performance.

Translation of the Instruments

The original instruments of this study were developed in the English version. The instruments were examined for content validity by three experts. After validation, the instruments were translated into Indonesian language. For developing the Indonesian version of all tools, the researchers used the back-translation technique for equivalence across the languages of these questionnaires. In this study, back-translation was employed in which the preferred back-translation approach requires at least two independent translators (Hilton & Skrutkowski, 2002). The first bilingual expert translator translated the original English version of the questionnaires into the Indonesian language. Then, the second bilingual translator translated the Indonesian

version back into English (second version). Both of translators were consulted to identify discrepancies, and adjustments were made for inconsistencies. Some discrepancies were found between the two English versions, which were “dizziness” and assess”. Revision of the Indonesian version was based on the results of these discussions.

Validity and Reliability of the Instruments

Validity of the Instruments

The intervention program, performance questionnaire, perceived confidence questionnaire, teaching plan, and booklet were validated by three experts in neurosurgical care. One of them was a doctor (neurosurgeon) from Songkla Hospital, Thailand, one was an APN of neurosurgical intensive care from Hatyai Hospital, Thailand, and one was a lecturer who was expert in TBI from the Faculty of Nursing, Prince of Songkla University, Thailand. The recommendations from all experts were performed to modify the instruments. The recommendations for the Injury Characteristics Questionnaire included the additional cause of injury such as car accident, body assault, blast injury, and sport injury. In addition, the recommendations of the Rivermead Post-concussion Symptom Questionnaire (RPSQ) included the additional explanation of fatigue symptoms using feeling more tired and lacking energy.

Reliability of the Instruments

The researcher examined the internal consistency reliability of the instruments. The Cronbach's alpha coefficient was used to determine the internal consistency reliability of the Perceived Confidence Questionnaire (PCQ) and the Performance Questionnaire (PQ). The instruments were tested on 20 family caregivers who met the same inclusion criteria. The results showed that the reliability coefficient of the PCQ and PQ were .96 and .68 which was considered as reliable for a newly developed instrument (Polit & Beck, 2008). The test-retest reliability of the Rivermead Post Concussion Symptom Questionnaire (RPQ) was assessed with Kappa coefficient. According to Landis and Koch as cited in Wynd, Schmidt, and Schaefer (2003), there are six levels of strength of agreement; poor (<.00), slight (.00 - .20), fair (.21 - .40), moderate (.41 - .60), substantial (.61 - .80), and almost perfect (.81 - 1.00). The result of test-retest of RPQ showed that five symptoms were considered as very good (noisy, restless, frustrated, and difficulty in thinking), six symptoms were considered as good (poor concentration, difficulty in remembering, sleep disturbance, fatigue, and light sensitivity), two symptoms were considered as moderate (blurred vision and double vision), two symptoms were considered as slight (headache and nausea), and one symptom (anger) could not be tested because of no value ability.

Pilot Study

The purpose of the pilot study was to test the feasibility of the methods and procedures for later use on a large scale (Everitt as cited in Thabane et al., 2010). The pilot study was conducted with 3 family caregivers who met the inclusion criteria at PKU Muhammadiyah Yogyakarta Hospital, Yogyakarta, Indonesia. They received

a self-efficacy enhancing education program with two follow-up telephone calls for four weeks. The result of the pilot study showed that the self-efficacy enhancing education program was feasible to be implemented in the target setting but the time of follow-up must be shorten from four weeks to two weeks. Then the researcher revised the time of follow-up plan. This pilot study was one kind of face validity.

Data Collection Procedures

The data collection procedures were divided into two phases: preparation and implementation phase.

Preparation Phase

In the preparation phase, the researcher carried out the following steps: (1) obtained official approval from the Faculty of Nursing Prince of Songkla University; (2) obtained official permission for data collection from PKU Muhammadiyah Yogyakarta Hospital and PKU Muhammadiyah Bantul Hospital, Yogyakarta, Indonesia; (3) prepared the materials and the questionnaire package including informed consent; (4) tested the validity and reliability of the instruments; (5) recruited two research assistants (RAs) who have at least a bachelor degree of nursing; (6) conducted training for the RAs; and (7) conducted the pilot study.

The RAs had the responsibility to carry out the pre-test and post-test data collection. There were three steps of training for the RAs. First, the researcher explained the objectives, protocol and the instruments used in this study. Secondly, the researcher provided an explanation about the RA's role and responsibility. Lastly,

the researcher and RAs reviewed each questionnaire. The RAs asked about any confusion and the researcher clarified them during this process to ensure that the RAs were able to answer any questions from the family caregivers during data collection.

Implementation Phase

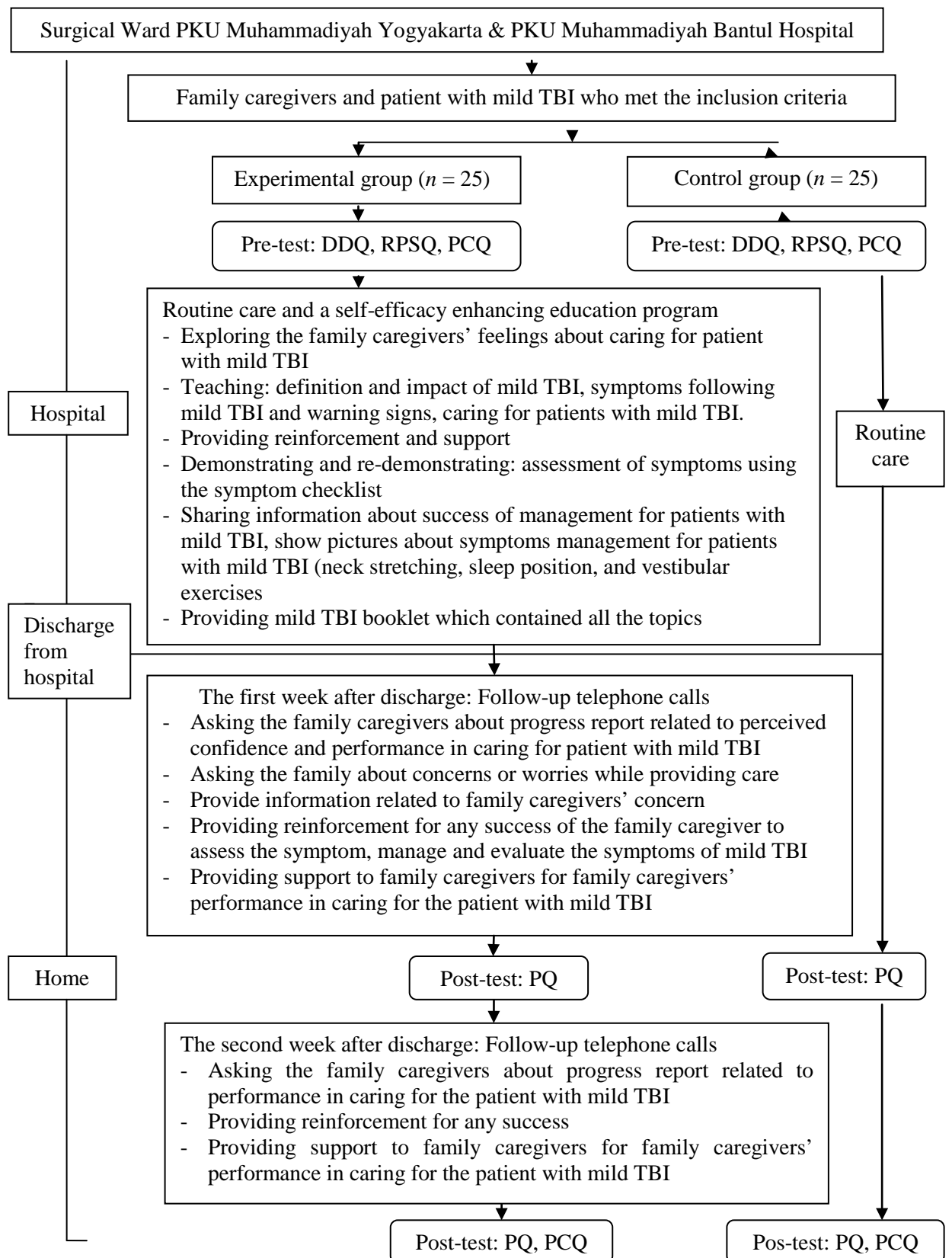
In the implementation phase, the researcher carried out the following steps: (1) asked the nurse in the surgical ward to select the family caregivers based on the inclusion criteria; (2) asked the family caregivers regarding their willingness to join in the study, the researcher conducted the study in the control group first; (3) explained the objectives of the study and asked the family caregivers to sign the informed consent form (Appendix B); (4) the RA collected the data, family caregivers were asked to complete the Demographic Data Questionnaire for the family caregivers and patient (DDQ), information from medical records regarding injury characteristics was collected and an assessment of the patient's symptom using the Rivermead Post-concussion Symptom Questionnaire (RPSQ) was also undertaken and the family caregivers' perceived confidence was measured using the Perceived Confidence Questionnaire (PCQ); (5) family caregivers received routine care; (6) after the first week of the patient's discharge, the RA conducted telephone calls to measure the performance using the Performance Questionnaire (PQ). In the second week, the researcher measured both the family caregivers' performance and perceived confidence.

After the number of family caregivers were fulfilled ($n = 25$), the researcher continued to conduct the intervention in the experimental group. Under the same conditions, (7) the RA collected the data using DDQ, injury characteristics of

patients, RPSQ, PCQ and PQ. After completing the questionnaires, (8) the family caregivers received a self-efficacy enhancing education program. The program was conducted in one session of around 60 minutes during hospitalization. In this program, the researcher asked the family caregivers to explore their feelings about caring for patients with mild TBI, taught about the definition, warning signs and symptoms after mild TBI, and caring for the patients with mild TBI, demonstrated some skills about the assessment and management of symptoms, and asked the family caregivers to re-demonstrate these skills. The researcher also shared information about the success of management for patients with mild TBI and showed some pictures related to symptoms management. A booklet was also provided by the researcher. After the first week of the patient's discharge; (9) the researcher conducted the first follow-up telephone calls. In this program, the researcher asked the family caregivers for a progress report related to caring for patients with mild TBI, asked about their concerns and worries while providing care, provided information related their concerns, provided reinforcement for any success and support for their performance in caring for patients with mild TBI; (10) the RA conducted telephone calls to measure the family caregivers' performance using PQ; (11) the researcher conducted the second follow-up telephone calls in which the activities were similar to the previous follow-up; and (12) the RA measured the family caregivers' performance and perceived confidence using telephone calls. Figure 2 on the next page shows the details of the implementation protocols of data collection procedures.

Ethical Considerations

This study was conducted after obtaining approval from the Research Ethics Committee of the Faculty of Nursing, Prince of Songkla University and permission from PKU Muhammadiyah Yogyakarta Hospital and PKU Muhammadiyah Bantul Hospital, Yogyakarta, Indonesia. The nurses in the ward introduced the researcher and RAs to the potential subjects. The researcher explained the objectives of the study, the procedure, and the possible benefits and risks of the study to the participants (Appendix B). The participants received information that they have the right to choose whether to participate in the program or they may withdraw at any time without any negative consequences. The participants conveyed their agreement to participate in the program verbally and the written consent. The researcher provided contact information including a telephone number and address for future reference. All of the subjects' information was kept confidential. Moreover, the subjects in the control group received education or counseling after the program was finished.



DDQ = Demographic Data Questionnaire); RPSQ = Rivermead Post-concussion Symptoms Questionnaire; PCQ = Perceived Confidence Questionnaire); PQ = Performance questionnaire.

Figure 2. The implementation protocol of data collection procedures

Data Analysis

Data were analyzed using descriptive and inferential statistics.

Descriptive statistics were used to analyze and describe the family caregivers' and patients' demographic data, and patients' clinical characteristics by using frequency, percentage, mean, and standard deviation. The Chi-square test, Fisher exact test, and Likelihood Ratio were used to test the equivalence of the proportion of demographic data and clinical characteristics between the control group and experimental group.

The researcher tested the assumption of the normality and homogeneity of variance of data sets of family caregivers' perceived confidence and family caregivers' performance. The normal distributions were determined by skewness and kurtosis, while, the homogeneities were determined by the non-significance of the Levene's test (Munro, 2001). The perceived confidence in caring for patients with mild TBI of both the control group and the experimental group met the assumptions. The dependent t-test was used to test the mean score differences of perceived confidence within the experimental group before and after receiving a self-efficacy enhancing education program, while the independent t-test was used to test the mean differences of perceived confidence between groups. The performance in caring for patients with mild TBI of both the control group and the experimental group did not meet the assumptions. Wilcoxon Signed Rank test was used to test the difference in the mean rank scores of performance within the experimental group, while Mann-Whitney U test was used to test the difference in the mean rank scores of performance between groups. The level of significance was set at $p < .05$.

CHAPTER 4

RESULTS AND DISCUSSION

This chapter presents the results and discussion of the study's findings. It is presented in three parts, namely: Part I: The demographic characteristics of the family caregivers, Part II: The demographic characteristics of patients, and patients' clinical characteristics; Part III: The effect of a self-efficacy enhancing education program on family caregivers' competencies in caring for patients with mild TBI within and between groups.

Results

Part I: Demographic Characteristics' of Family Caregivers

Demographic characteristics of family caregivers. Table 1 shows that the mean age of the subjects in the control group was 38.76 years old ($SD = 10.30$) and the experimental group was 43.96 years old ($SD = 14.27$). More than half of the subjects in both groups were female. The majority of the subjects in both groups were married and Moslem. Half of the subjects in the control group (53%) had secondary school education while half of the subjects in the experimental group (48%) had primary school education. More than half of the subjects in both groups were employed. The subjects in both groups had a relationship with the patients as a spousal, 36% of the control group and 44% of the experimental group. There were no statistical differences in the demographic characteristics between the two groups.

Table 1

Frequencies and Percentages of Family Caregivers' Characteristics of the Control and the Experimental Group (N = 50)

Characteristics	Control Group (n = 25)		Experimental Group (n = 25)		Total		Statistics	p
	n	%	n	%	n	%		
Age	<i>MD (SD)</i>		<i>MD (SD)</i>				2.95 ^a	.23
(Min-Max = 20-69)	38.76 (10.30)		43.96 (14.27)					
20-40	15	60	9	36	24	48		
41-60	9	36	14	56	23	46		
>60	1	4	2	8	3	6		
Gender							0.33 ^b	.56
Female	16	64	14	56	30	60		
Male	9	36	11	44	20	40		
Marital Status							2.11 ^a	.35
Married	22	88	19	76	41	82		
Single	3	12	5	20	8	16		
Widowed			1	4	1	2		
Religion							1.02 ^c	1.00
Moslem	25	100	24	96	49	98		
Christian			1	4	1	2		
Education Level							9.26 ^a	.10
Primary School	9	36	12	48	21	42		
Secondary School	13	52	8	32	21	42		
College/university	3	12	5	20	8	16		
Occupation							3.62 ^a	.46
No occupation	7	28	9	36	16	32		
Had occupation	18	72	16	64	34	68		
- Government officer	1	4	3	12	4	8		
- Laborer	1	40	8	32	18	36		
- Farmer	7	28	5	20	12	24		
Relationship							8.64 ^a	.20
Spouse	9	36	11	44	20	40		
Parent	3	12	7	28	10	20		
Child	7	28	4	16	11	22		
Other relative	6	24	3	12	9	18		

Note. ^a = Likelihood ratio test, ^b = Chi-square test, ^c = Fisher's exact test.

Part II: Demographic Characteristics' of Patients and Patients' Clinical

Characteristics

Demographic characteristics of patients with mild TBI. The mean age of the patients in the control group was 41.12 years old ($SD = 16.20$) and the experimental group was 41.08 ($SD = 18.58$). Half of the patients in both groups were female. More than half of the subjects in the control group were married (64%), while a half of the subjects in the experimental group were married (48%). The majority of subjects in both groups were Moslem. Half of the subjects both in groups had secondary school education, 56% of the control group and 60% of the experimental group. More than half of the subjects in the control group were employed (76%) and the majority of subjects in the experimental group were employed (92%). There were no statistical differences in the demographic characteristics between both groups (Table 2).

Table 2

Frequencies and Percentages of Patients Characteristics of the Control and the Experimental Group (N =50)

Characteristics	Control Group (n = 25)		Experimental Group (n = 25)		Total		Statistics	p
	n	%	n	%	n	%		
Age	<i>MD (SD)</i>		<i>MD (SD)</i>		<i>MD (SD)</i>		.90 ^a	.64
(Min-Max = 17-85)	41.12	(16.20)	41.08	(18.58)	41.10	(17.25)		
17-40	13	52	13	52	26	52		
41-60	10	40	8	32	18	36		
>60	2	8	4	16	6	12		
Gender							.08 ^b	1.00
Female	14	56	13	52	27	54		
Male	11	44	12	48	23	46		
Marital Status							1.39 ^a	.50
Married	16	64	12	48	28	56		

Note. ^a = Likelihood ratio test, ^b = Chi-square test, ^c = Fisher's exact test.

Table 2 (continued)

Characteristics	Control Group (<i>n</i> = 25)		Experimental Group (<i>n</i> = 25)		Total		Statistics	<i>p</i>
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%		
Marital Status							1.39 ^a	.50
Single	8	32	11	44	19	38		
Widowed	1	4	2	8	3	6		
Religion							1.02 ^c	1.00
Moslem	25	100	24	96	49	98		
Christian			1	4	1	2		
Education Level							1.87 ^a	.87
Primary School	8	32	7	28	15	30		
Secondary School	14	56	15	60	29	58		
College/university	3	12	3	12	6	12		
Occupation							3.93 ^a	.56
No occupation	6	24	2	8	8	16		
Had occupation	19	76	23	92	42	84		
- Government officer	2	8	3	12	5	10		
- Laborer	10	40	14	56	24	48		
- Farmer	4	16	3	12	7	14		
- Student	3	12	3	12	6	12		

Note. ^a = Likelihood ratio test, ^b = Chi-square test, ^c = Fisher's exact test.

Patients' clinical characteristics. Table 3 shows that the majority of causes of injury in both groups were mainly from motorcycle accidents. Almost all subjects had a GCS on admission at 15. With regards to the CT scan, 48% subjects of the control group had cerebral edema, while, the experimental group had 40% with normal findings and 40% with cerebral edema. More than half of the subjects in both groups were hospitalized from 4 days up to 6 days. Regarding the patients' symptoms at discharge, the majority of the subjects in both groups had symptoms (92%) and the majority of symptom was headache. There were no statistical differences in the clinical characteristics between the two groups.

Table 3

Frequencies and Percentages of Patients' Clinical Characteristics of the Control Group and the Experimental Group (N = 50)

Characteristics	Control Group (n = 25)		Experimental Group (n = 25)		Total		Statistics	p
	n	%	n	%	n	%		
Cause of injury							4.86 ^a	.18
Bicycle accident	1	4	2	8	3	6		
Motorcycle accident	24	96	20	80	44	88		
Falling injury			2	8	2	4		
Other			1	4	1	2		
GCS Score							2.87 ^a	.24
13	1	4			1	2		
14	1	4			1	2		
15	23	92	25	100	48	96		
CT Scan							1.62 ^a	.66
Normal	11	44	10	40	21	42		
Cerebral edema	12	48	10	40	22	44		
SDH/EDH	1	4	3	12	4	8		
Extracranial hematoma	1	4	2	8	3	6		
Other injuries							.00 ^b	1.00
Yes	4	16	4	16	8	16		
No	21	84	21	84	42	84		
Hospitalization (min-max 3 – 14 days)							1.06 ^a	.59
1-3 days	4	16	2	8	6	12		
4-6 days	13	52	16	64	29	58		
≥7 days	8	32	7	28	15	30		
Symptoms							.61 ^b	.31
No symptom	1	4	3	12	4	8		
Had symptom	24	96	22	88	46	92		
- Headache	23	92	16	64				
- Dizziness	20	80	16	64				
- Fatigue	8	32	6	24				
- Difficulty in remembering	2	8	3	12				
- Nausea	13	52	15	60				
- Noise	3	12	3	12				
- Sleep disturbance	7	28	5	20				
- Restlessness	5	20	1	4				
- Light sensitivity	4	16						

Note. ^a= Likelihood ratio test, ^b= Fisher's exact test; SDH = subdural hematoma, EDH = epidural hematoma.

Table 3 (continued)

Characteristics	Control Group (<i>n</i> = 25)		Experimental Group (<i>n</i> = 25)		Total		Statistics	<i>p</i>
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%		
- Blurred vision	4	16	3	12				
- Double vision	2	8	1	4				
- Feeling frustration	2	8	1	4				
- Irritability			1	4				
- Poor concentration	2	8	3	12				
- Longer to think	8	8	2	8				

Note. ^a= Likelihood ratio test, ^b= Fisher's exact test; SDH = subdural hematoma, EDH = epidural hematoma.

Part III: The Effect of a Self-Efficacy Enhancing Education Program on Family Caregivers' Competencies in Caring for Patients with Mild TBI

Before testing the effect of a self-efficacy enhancing education program on family caregivers' perceived confidence and performance in caring for patients with mild TBI, the family caregivers' perceived confidence in caring for patients with mild TBI at the baseline was assessed. Table 4 showed that there were no significant differences of perceived confidence between the control group and the experimental group (Table 4). The mean score of perceived confidence in the control group and the experimental group were 51.24 (10.76) and 57.60 (16.62), respectively.

Table 4

Comparison of the Perceived Confidence Scores in Caring for Patients with Mild TBI between Two Groups before Intervention (N = 50)

Variable	Control Group (<i>n</i> = 25)		Experimental Group (<i>n</i> = 25)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Perceived confidence	51.24	10.76	57.60	16.62	1.61	.12

Family caregivers' perceived confidence in caring for patients with mild TBI within the experimental group. The mean scores of the perceived confidence at pre-test and post-test score in the experimental group were 57.60 (16.62) and 80.68 (9.67), respectively. The dependent t-test showed that the mean score of the perceived confidence of subjects in the experimental group after received a self-efficacy enhancing education program was significantly higher than before ($t = -8.44, p < .05$) (Table 5). This result supported the first hypothesis.

Table 5

Comparison of the Perceived Confidence Pre-test and Post-test Scores in Caring for Patients with Mild TBI within the Experimental Group (N=25)

Perceived Confidence	Experimental Group		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>		
Pre-test	57.60	16.62	-8.44	.00
Post-test	80.68	9.67		

Family caregivers' performance in caring for patients with mild TBI within the experimental group. Table 6 shows the performance in the experimental group at the first week and the second week. The mean rank of the performance in the first week and the second week in the experimental group were 6.00 and .00. Using a Wilcoxon Signed Rank test, the result of performance score in the experimental group after received a self-efficacy enhancing education program at the second week was significantly lower than those in the first week ($Z = -2.94, p < .05$). This result did not support the second hypothesis (Table 6).

Table 6

Comparison of the Performance Scores in Caring for Patients with Mild TBI in the First Week and Second Week within the Experimental Group (N=25)

Performance	First week		Second week		Z	p
	MR	SR	MR	SR		
Experimental Group	6.00	(66.00)	.00	(.00)	-2.94	.00

Note. MR = mean rank, SR = sum of rank.

However, when comparing the family caregivers' performance in caring for patients with mild TBI in the first week and the second week based on each domain of caring for patients with mild TBI, it was shown that the majority of performances in the second week were decreased except two domains which were assessing warning signs and managing headache (Table 7).

Table 7

Comparison of the Performance Scores in the First Week and Second Week Based on Each Domain of Caring for Patients with Mild TBI within the Experimental Group (N=25)

Performance	First week		Second week		Z	p
	MR	SR	MR	SR		
Assessing warning signs	0.00	0 .00	0.00	0.00	0.00	1.00
Assessing symptoms	6.00	66.00	0.00	0.00	-2.95	.00
Managing headache	0.00	0 .00	0.00	0.00	0.00	1.00
Managing dizziness	5.50	55.00	0.00	0.00	-2.83	.00
Managing fatigue	6.00	66.00	0.00	0.00	-2.96	.03
Managing difficulty in remembering	5.00	45.00	0.00	0.00	-2.70	.00
Evaluating symptoms	5.00	45.00	0.00	0.00	-2.75	.01

Note. MR = mean rank, SR = sum of rank.

Family caregivers' perceived confidence in caring for patients with mild TBI between groups. Regarding the family caregiver's perceived confidence score, an independent t-test was used to examine the differences between the groups

(Table 8). After receiving a self-efficacy enhancing education program, the mean score of perceived confidence in the experimental group was significantly higher than that of the control group ($t = 8.30, p < .05$). The findings supported the third hypothesis.

Table 8

Comparison of the Perceived Confidence Scores in Caring for Patients with Mild TBI between Two Groups (N = 50)

Perceived confidence	Control Group (n = 25)		Experimental Group (n = 25)		t	p
	M	SD	M	SD		
Post-test	52.96	13.60	80.68	9.67	8.30	.00

Family caregivers' performance in caring for patients with mild

TBI between groups. In order to examine the effect of a self-efficacy enhancing education program, the performance at the second week of the experimental group and the control group were examined by using Mann-Whitney U test. Table 9 shows that the mean rank of performance in the control group and the experimental group were 13.00 and 38.00, respectively. The significant difference was found ($U = .00, p < .05$).

Table 9

Comparison of the Performance Scores in Caring for Patients with Mild TBI in the Second Week between Two Groups (N = 50)

Performance	Control Group (n = 25)		Experimental Group (n = 25)		U	p
	MR (SR)	MR (SR)	MR (SR)	MR (SR)		
Second week	13.00 (325.00)	38.00 (950.00)	38.00 (950.00)	13.00 (325.00)	0.00	.00

Note. MR = mean rank, SR = sum of rank.

Patients' symptoms. In regards to the patient's symptoms before discharge that were reported by patients and the patients' symptoms after discharge that were reported by family caregivers, Table 10 shows that the majority of patients' symptoms in both groups were headaches. Three of the patients' symptoms remained during the first week and the second week in the control group, which were headache, dizziness, and fatigue. The occurrence of patients' symptoms in the experimental group was only reported in one case with headache symptoms (4%) in the first week after discharge and no symptoms reported in the second week after discharge. In addition, the warning signs did not occur in both groups in the first week and the second week after discharge.

Table 10

Frequencies and Percentages of Patients' Symptoms at Different Time Points (Before Discharge, in the First Week and the Second Week after Discharge) in the Control and the Experimental Group (N = 50)

Symptoms	Control Group (n = 25)		Experimental Group (n = 25)	
	n	%	n	%
Before discharge*				
No symptom	5	20	10	40
Headache	18	72	13	52
Dizziness	17	68	13	52
Fatigue	8	32	4	16
First week after discharge				
Warning signs				
- Yes				
- No	25	100	25	100
Mild TBI symptoms*				
- No symptom	7	28	24	96
- Headache	14	56	1	4
- Dizziness	11	44		
- Fatigue	8	32		

Note. * = one patient had more than one symptom.

Table 10 (continued)

Symptoms	Control Group (<i>n</i> = 25)		Experimental Group (<i>n</i> = 25)	
	<i>n</i>	%	<i>n</i>	%
Second week after discharge*				
Warning signs				
- Yes				
- No	25	100	25	100
Mild TBI symptoms*				
- No symptom	8	32	25	100
- Headache	12	48		
- Dizziness	9	36		
- Fatigue	4	16		

Note. * = one patient had more than one symptom.

Discussion

Discussion of the study consists of demographic characteristics of family caregivers, demographic characteristics of patients, patients' clinical characteristics, and the effect of a self-efficacy enhancing education program on family caregivers in caring for patients with mild TBI.

Demographic Characteristics of Family Caregivers

There were no significant differences between the control group and experimental group at the baseline. The average age of subjects in both groups was around 40 years which is similar to a previous study in Indonesia (Utami, 2012). The majority of subjects in both groups were female which is similar to the previous studies (Backhaus, Ibarra, Klyce, Trexler, & Malec, 2010; Shocker, 2008; Sinnakarupapan et al., 2005; Utami, 2008). More than half of the subjects in both groups had higher education level (secondary school and college/university) which

were different compared to the previous study in which Shocker (2008) and Utami (2012) found that the majority of family caregivers had a lower education levels (primary school). Family caregivers with high education level were expected to have better competencies in terms of skills than those with low education levels (Muhlenkamp & Syales as cited in Srijumnong, 2010). The majority of family caregivers were married and half of the subjects had the relationship of spouse to the patients, was the same with the previous study (Utami, 2012). The relationship between the family caregivers and patients may influence in the care provision. Family caregivers of spouses spent more time in providing care than family caregivers of parents (Stoller as cited in Mathiowitz & Olikier, 2005). The majority of subjects in both groups worked and mostly as laborers, which similar to a previous study (Shocker, 2008).

Demographic and Clinical Characteristics of Patients

Demographic characteristics of patients. There were no significant differences between the control group and experimental group at the baseline. The mean age of subjects in both groups in this study was 41.10 years. This result was similar to the previous studies (Jamaludin, 2008; Kurniawan, 2009) who found that mostly mild TBI in Yogyakarta, Indonesia occurred at this average age. Half of the mild TBI subjects in this study were female (54%). In contrast, a previous study found that the majority of mild TBI patients were mostly male (Hou, Moss-Morris, Peveler, Mogg, Bradle, & Belli, 2011). In general, male patients with mild TBI had a higher incidence than female patients in Indonesia (Jamaludin, 2008; Kurniawan, 2009) and also found in other countries (Lundin, Boussard, Edman, & Borg, 2006; Meares et al.,

2008; Tunvirachaisakul, Thavichachart, & Worakul, 2011). However, the ratio of female to male may be equal in the future as the high numbers of Indonesian women are working outside similar to men.

Patients' clinical characteristics. There were no significant differences between the control group and the experimental group at baseline. Regarding the cause of mild TBI, it was found that the majority of mild TBI was caused by motorcycle accident (96%). This result was consistent with the previous study in Indonesia, in which Kurniawan (2009) and Utami (2012) found that the majority of mild TBI were caused by motorcycle accidents. Regarding the patients' hospitalization, the majority of patients with mild TBI in this study were hospitalized more than three days. According to the guideline of treatment for patients with mild TBI in Indonesia, patients needed hospitalization for observation and providing medication in the hospital within three days (Siswanto & Wahyu, 2012). The majority of the subjects were fully conscious (GCS = 15) which similar to previous studies (Hou et al., 2011, Lundin et al., 2006; Meares et al., 2008). More than half of the subjects had CT scan findings in both groups as an abnormal CT scan including cerebral edema, subdural hematoma (SDH), and epidural hematoma (EDH). Those abnormal CT scan results were also found in other studies (Hou et al, 2011; Lundin et al., 2006; Sigurdardottir, Andelic, Roe, Jerstad, & Schanke, 2009). Some studies found that the abnormality of the CT scan may influence patients' symptoms (Iverson, 2006; Kashluba, Hanks, Casey, & Millis, 2008; Sadowski-Cron et al., 2006). According to the findings of patients' symptoms, the majority of subjects had post traumatic headache (Table 3). Headache is the most common symptoms of mild TBI patients in the early stage after injury (Lundin et al., 2006; Yang et al., 2007).

The Effect of a Self-Efficacy Enhancing Education Program on Family Caregivers' Competencies in Caring for Patients with Mild TBI

This experimental study showed in significant positive findings on family caregivers' competencies in caring for patients with mild TBI. The findings of the present study confirmed all hypotheses except the second hypothesis. The first hypothesis which was supported by the findings that after receiving the self-efficacy enhancing education program, the perceived confidence in caring for patients with mild TBI among family caregivers were higher than before (Table 5). The second hypothesis was not supported by the results, which showed that family caregivers' performance was significantly decreased in the second week after discharge compared to the first week (Table 6). The third and fourth hypothesis was supported in terms of the family caregivers' perceived confidence (Table 8) and performance (Table 9) in caring for patients with mild TBI who receiving a self-efficacy enhancing education program were higher than those receive the routine care. There are several reasons underpinning the positive findings of family caregivers' competencies include application of self-efficacy based on Bandura's theory, education session, follow-up, and family caregivers' confidence.

Application of self-efficacy based on Bandura's theory. The application of a self-efficacy enhancing education program based on the four sources of self-efficacy from Bandura (1997) which include enactive mastery experiences, vicarious experience, verbal persuasion, and physiological states. The Bandura's self-efficacy theory is a useful framework to guide an educational program. It can increase one's self-judgment of personal capabilities to initiate and successfully perform a specified task at designated levels and one expends greater effort. A person who

believes in their self-efficacy will practice with perseverance, industry and persistence until becoming successful eventually (Bandura, 1997).

With regard to the program of the physiological and affective status, family caregivers had an opportunity to explore their feelings about caring for mild TBI patients such as talking their problems, anxiety or worry. The researcher and the family caregivers discussed together regarding about it. This could help family caregivers to release their problems, anxiety and worry in the care provision of the patient's. Bandura (1997) has mentioned that a high physiological and affective state can influence individual performance to achieve success. Family caregivers' distress can influence family functioning in taking care of the patients with traumatic brain injury (Testa, Malec, Moessner, & Brown, 2006). Similar to Srijumnong (2010) who provided an opportunity for family caregivers to explore their feelings as a part of the self-efficacy promotion program, therefore, the stress of family caregivers could be decreased.

In verbal persuasion, family caregivers received support, reinforcement, and feedback. These activities may improve family caregivers' and self-efficacy (Srijumnong, 2010). In addition, they received health education including basic information about mild TBI and the management of mild TBI. The education may affect positive changes of family caregivers' self-efficacy in caring for patients with mild TBI (Utami, 2012). All these activities serves as a further mean of strengthening people's beliefs that they possess the capabilities to get what they seek (Bandura, 1997).

By vicarious experience, family caregivers received information about the successful management of mild TBI patients and they looked at some pictures

related to management of mild TBI such as neck stretching which could decrease headache symptoms, vestibular exercise which could overcome dizziness symptoms, the arrangement of diet and exercise which could help fatigue symptoms, and reminding patients anything such as name and place which help to prevent or manage the difficulty in remembering. In addition, family caregivers looked at some pictures related to these managements of mild TBI patients. These activities were effective through symbolic modeling which is an effective way to raise efficacy (Bandura, 1997). By seeing oneself perform successfully, it can provide clear information on how best to perform skills and it strengthens beliefs in one's capability (Bandura, 1997).

Using enactive mastery experience as a part in this study, the researcher demonstrated some skills of caring for patients with mild TBI such as neck stretching, vestibular exercise, deep breathing, sleep position, and assessing symptoms using the symptoms checklist. Subsequently, the researcher asked family caregivers to re-demonstrate these skills and they were given an opportunity to ask some questions. The researcher also provided feedback and reinforcement for their success. These activities could improve family caregivers' skill. As a result, they felt more confident. This is similar to the previous study that performed demonstrations may increase family caregivers' skill (Kouri et al., 2011) and self-efficacy (Srijumnong, 2010). According to Bandura (1997), enactive mastery experience in term of performing skills is the most influential sources of efficacy information because it was the most authentic evidence. Moreover, the development of efficacy beliefs through enactive experience creates the cognitive and self-regulative facility

for effective performance. In addition, easily mastered skills can develop the cognitive basis of human competencies.

Educational session. The educational session was given as individual based rather than a group-based session. It can help family caregivers to be more focused when the researcher provided the education and they felt to be more confident to re-demonstrate some skills. Utami (2012) conducted an individualized education program for family caregivers caring for mild TBI patients in the emergency department who having no hospitalization and this strategy helped them to increase their self-efficacy. Additionally, this program was provided earlier or the day before discharged patients from hospital. It was a sufficient time to prepare family caregivers to be ready before discharge. Similar with the previous study, Utami (2012) conducted health education for family caregivers before discharge and this program had beneficial outcomes to prepare family caregivers in caring for patients.

Furthermore, the content of this educational session focused on the definition of mild TBI, following symptoms of mild TBI, symptoms assessment, symptoms management, and symptoms evaluation which were also included in the booklet. These contents provided the basic knowledge to the family caregivers related to the mild TBI. Glanz, Rimer, and Vismanath (2008) mentioned that knowledge is one factor that can strengthen of self-efficacy. The booklet used simple language and pictures which could assist family caregivers to gain better understanding. Although the researcher did not measure their satisfaction, the family caregivers who accepted the booklet during the program reported that it was useful to them as guidance in caring for patients with mild TBI. The family caregivers read the booklet several times to make sure that they had followed the guidance given on how to take care of

the mild TBI patients. This study is similar to a previous study in that the booklet was very helpful for caregivers to understand about caring for patients with traumatic brain injury and it helped to alleviate some of the anxiety experienced in the early stages of head injury (Morris, 2001). Therefore, family caregivers could learn more about caring for patients with mild TBI as well by themselves.

Follow-up. The follow up telephone calls after discharge could help family caregivers to feel more competent. Some issues that occurred while caring at home were also consulted via phone. The researcher encouraged the family caregivers to talk about their success in their practice of caring for their patients. Family caregivers reported that the knowledge and skills that had been demonstrated by researcher were very beneficial and easy to do it. They had been provided caring for patients directly every day such as management of headache, fatigue, dizziness, and difficulty in remembering. They also learned from their own direct experiences, as a result their confidence in caring for mild TBI patients were increased. Kouri, Ducharme, and Giroux (2011) who mentioned that modeling from family caregivers themselves may increase self-efficacy by the success of the applying skills after an education program. The researcher also provided reinforcement related their success in caring the patients with mild TBI via phone.

In the follow-up activity, the researcher also asked the family caregivers to report and repeat what they learned at hospital about caring for patients with mild TBI. This activity aimed to encourage and remind the family caregivers about caring for patients with mild TBI. The family caregivers could explain it as well. In addition, the researcher provided an opportunity for them to express their feelings and they reported that they felt more confident in caring for their patients.

Moreover, the family caregivers were provided time for consultation related to their worries or concerns such as a diet for patients with headaches. They received information related to their concerns. In the second follow-up, some family caregivers had problems related to their caring for patients, they were busy with their work and sometime forgot to care for the patients. The researcher encouraged them and provided strategies such as providing information related to symptoms management before they went to work and they could follow-up on the patients using telephone calls. Under the Bandura's concept, verbal persuasion may be another source of continued self-efficacy development. Hence, a follow-up activity is one way to help family caregivers to enhance their confidence in caring for their patients (Connell & Janevic, 2009; Srijumnong, 2010) and it is one important way to monitor and help family caregivers in their performance directly to the patients (Kouri et al., 2011). As a result, they could be successful in their performance.

However, the family caregivers' performance was measured using telephone calls, which could make the response bias because the performance in caring for patients with mild TBI was reported verbally by family caregivers and it was not observed directly. This limitation could influence the findings. Therefore, the researcher followed-up twice to monitor the family caregivers' performance in caring for patients with mild TBI at home and encouraged caring activities during the follow-up as mentioned above.

Family caregivers' confidence. Based on the results, the family caregivers' perceived confidence in the experimental group was increased after receiving a self-efficacy enhancing education program and the scores of perceived confidence were significantly higher than that of the control group. Subsequently, the

family caregivers' performance scores in the experimental group were significantly higher than the control group. Self-efficacy had a relationship with family caregivers' performance in their caring for patients with mild TBI. Family caregivers who were confident may be more success to perform caring for their patients. According to Bandura (1997) self-efficacy is fundamental to competent performance. People with high self-efficacy will positively affect performance (Bandura, 1982; Kouri et al., 2011; Li & McLaughlin, 2011).

Although family caregivers' performance in the experimental group was increased after discharge at the first week, the result found that the performance at the second week was decreased as compared to the first week except some domains of caring were remained in terms of assessing warning signs and managing headaches (Table 7). Moreover, family caregivers still performed activities in caring for patients but performed less. This is partly due to most symptoms were disappeared and unrecognized to detect or required further management. According to the previous study reported that the greater of patients' symptoms was related to the amount of care (Anderson, Parmenter, & Mok, 2002). In addition, daily assessment and monitoring would allow them to perform after phone calls. Based on the discussion with the family caregivers during follow-up, they were busy with their work and sometime forgot to provide care especially for those patients who were able to care themselves. More than half of family caregivers in this study (64%) were employed. In addition, family caregivers who had working may influence in their caregiving roles for patients (Wang, Shyu, Chen, & Yang, 2010). Moreover, family caregivers with mild and moderate brain injury were more likely to work outside because the person with injury needed less supervision (Sady et al., 2010).

Regarding patients' symptoms in the first week and the second week after discharge, the most common symptoms after mild TBI were headache, dizziness and fatigue similar to those in the previous study (Dischinger, Ryb, Kufera, & Auman, 2009; Yang et al., 2007). Patients in the control group reported symptoms both in the first week and second week after discharge. On the other hand, in the experimental group, only one patient reported symptoms in the first week after discharge from hospital and all patients reported no symptoms in the second week after discharge. In this group, family caregivers performed caring for patients with mild TBI including an assessment of warning signs and following symptoms, symptoms management, and symptoms evaluation.

In symptoms management, family caregivers often managed four symptoms such as headache, dizziness, fatigue, and difficulty to remember, by guiding the patients to do some exercises including vestibular exercise, neck exercise, helping in the management of fatigue and difficulty in remembering every day during the first and second week after discharge. Regarding to post concussive symptoms, vestibular rehabilitation could reduce dizziness and improve gait and balance function after concussion (Alsalaheen et al., 2010; Gottshall, 2011). In addition, the family caregivers provided neck exercise for the patients. This exercise was effective to reduce or prevent a headache following a mild TBI (Ylinen, Nikander, Nykanen, Kautiainen, & Hakkinen, 2009). Additionally, exercises could reduce symptoms in patients with post-concussion syndrome (Kozlowski, 2008).

In conclusion, the self-efficacy enhancing education program in this study significantly improved the family caregivers' perceived confidence and performance in caring for patients with mild TBI. Although, the family caregivers'

performance score within the experimental group was decrease in the second week, these performance scores were significantly higher than those in the control group. In addition, the occurrence of symptoms in the experimental group was lower than the control group both in the first week and second week. The results of this study did not only offer benefits to family caregivers, but also gave benefits to the mild TBI patients through their active participation in caregiving. Therefore, a self-efficacy enhancing education program was recommended for promoting family caregivers with patients with mild TBI.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

This chapter presents the conclusions of the study based on the research findings. The strengths and limitations of the study are also presented. Furthermore, implication and recommendations for nursing practice, nursing education, and future studies will be offered.

Conclusion

The objective of the study was to examine the effect of a self-efficacy enhancing education program on family caregivers' competencies in caring for patients with mild TBI in Yogyakarta, Indonesia. A quasi-experimental pre-test and post-test design with non-equivalent control group was conducted at the medical and surgical ward of PKU Muhammadiyah Yogyakarta and PKU Muhammadiyah Bantul Hospital, Yogyakarta, Indonesia, from November 2012 to February 2013. Fifty subjects who met the inclusion criteria were recruited. The twenty five subjects in the experimental group received the routine care and a self-efficacy enhancing education program and two follow-up phone calls, whereas another twenty five subjects in the control group received the routine care.

The instruments consisted of the family caregivers' demographic data, patients' demographic data, patients' clinical characteristics, the Rivermead Post-concussion Symptom Questionnaire, the Perceived Confidence Questionnaire, and Performance Questionnaire. The questionnaires was validated by three experts and

tested for reliability by using Cronbach's alpha coefficient for Perceived Confidence Questionnaire yielding of .96 and the Performance Questionnaire yielding .68, whereas the Rivermead Post-concussion Symptom Questionnaire was tested by test re-test reliability yielding of five symptoms in very good agreement, six symptoms in good agreement, two symptoms in moderate agreement, two symptoms in slight agreement, and one symptom could not be tested because of no value ability.

In regards to the demographic characteristics of both the family caregivers and the patients, the patients' clinical characteristics were presented using frequency, percentage, mean, and standard deviation. The Chi-square, Fisher exact test, and Likelihood ratio test were used to test the proportion of equivalence between the experimental group and control group. A paired t-test was used to measure the significant differences of perceived confidence within the group, whereas Wilcoxon Signed Rank test was used to measure the significant differences of performance within the group. An Independent t-test was used to measure the significant differences of perceived confidence between the groups and Mann-Whitney U test was used to examine the significant differences between groups.

The findings revealed four main results. Firstly, the mean score of perceived confidence in the experimental group was significantly higher after receiving the program ($t = -8.44, p < .05$). Secondly, the mean rank score of the performance in the experimental group in the second week was significantly lower than those in the first week ($Z = -2.94, p < .05$). Thirdly, there was a significant difference of perceived confidence between the experimental group and the control group ($t = 8.30, p < .05$). Fourthly, the performance between the experimental group and the control group showed significant difference ($U = 0.00, p < .05$). According to

the findings, this self-efficacy enhancing education program improved the family caregivers' perceived confidence and also measured their performance in caring for patients with mild TBI after discharge.

Strengths and Limitations of the Study

The study had several strengths. Firstly, the individualized education program approach including follow ups after discharge with some specific content could improve the family caregivers' perceived confidence. Secondly, the theory-driven approach using self-efficacy from Bandura (1997) is considered as an appropriate intervention. Thirdly, the self-efficacy enhancing education program used multiple educationally strategies to improve family caregivers' competencies in terms of perceived confidence and performance in caring for patients with mild TBI.

Besides these strengths, this study had some limitations. Firstly, this study did not apply the random assignment as it will threaten the internal validity. Secondly, the perceived confidence was not measured in the first week after discharge, therefore it could influence the performance in caring for patients with mild TBI. Thirdly, follow-up using telephone calls were conducted to ensure effectiveness and improvement, however it may not reflect the real action due to a lack of observation and it could make the measurement bias. Fourthly, even the individualized education program had strengths, however this method could take a lot of time to administer.

Implications and Recommendations

This study provides evidence of the effectiveness of a self-efficacy enhancing education program on family caregivers' competencies. Some recommendations for the nursing practice are proposed.

Nursing Practice

Nurses should provide a self-efficacy enhancing education program for family caregivers who are caring for mild TBI before discharge and implement with follow-up phone calls. Nurses should provide support for the family caregivers to take care of their patients and provide written materials such as booklets or other teaching media for family caregivers as guidance in caring for mild TBI patients.

Nursing Education

The findings of this study can be used as a guide for novice nurses to educate family caregivers in caring for patients with mild TBI. In addition, the results of the study can also be used as basic knowledge for further development of self-efficacy enhancing education program for monitoring family caregivers' performance.

Nursing Research

Further research is needed to use random assignment to minimize the selection bias. A study design using randomized controlled trials is strongly recommended. Additionally, the researcher needs to conduct the education program in a shorter time period (less than one hour), in group education instead individualized

education, and use other media in the education program. Subsequently, the researcher could conduct follow-ups face to face. This program may be beneficial to incorporate a longer time period for follow-ups. Moreover, perceived confidence must be continuously measured with performance in the following week after discharge to ensure the effectiveness of the program.

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APPENDICES

APPENDIX A

Effect Size Calculation

1. Effect size of the previous study

The calculation effect size (d) of this study is as below:

$$d = \frac{M_1 - M_2}{\text{pooled } SD} \quad \text{and where } \text{pooled } SD = \sqrt{\frac{SD_1^2 + SD_2^2}{2}}$$

Where M_1 : Mean of experimental group (pre-test)

M_2 : Mean of experimental group (post-test)

pooled SD : Standard deviation of the experimental group (pre-test and post-test)

Where $M_1 = 69.87$; $M_2 = 79.93$

$SD_1 = 11.05$; $SD_2 = 8.14$

$$\begin{aligned} \text{pooled } SD &= \sqrt{(11.05)^2 + (8.14)^2 / 2} \\ &= \sqrt{(122.1025 + 66.2596) / 2} \\ &= \sqrt{188.3621 / 2} \\ &= \sqrt{94.18105} \\ &= 9.7046922 \end{aligned}$$

$$d = 69.87 - 79.93 / 9.7046922$$

$$= -10.06 / 9.7046922$$

$$= -1.036612$$

APPENDIX B

Informed Consent

My name is Erfin Firmawati. I am a master nursing student at Prince of Songkla University, Thailand. I am also a lecturer of Faculty of Nursing, Muhammadiyah University of Yogyakarta, Indonesia. I am conducting a research entitle “Effect of a Self-Efficacy Enhancing Education Program on Family Caregivers’ Competency in Caring for Patients with Mild Traumatic Brain Injury in Yogyakarta, Indonesia”. This study will be held for four weeks and the findings of this study are expected to improve the family competencies with mild TBI. This study has been approved by the Research Ethics Committee of Prince of Songkla University, Thailand and also has been granted permission from PKU Muhammadiyah Yogyakarta Hospital and PKU Muhammadiyah Bantul Hospital. You are asked to participate in this study. If you are interested, I will explain the procedures as follows:

Explanation Procedures

1. You will be assigned to either the experimental or the control group
2. If you are in the experimental group, you will receive a self-efficacy enhancing education program during the period of study. In addition, a routine care will be provided by our nurses.
3. If you are in the control group, you will not receive the program. You will receive a routine care in the surgical ward. However, if you want to receive the similar program, you will receive it after the end of the study.

Evaluation and Forms

1. You will be asked to fill the forms about your personal data and health information. This activity will spend time around 15 minutes.
2. You will be asked to fill the perceived confidence questionnaire and the performance to measure your competencies in caring for patients with mild TBI before the program (in the hospital) and after the program in the first week and the second week after discharge (at home) via phone calls. This activity will spend time around 15 minutes.

Risk and Comfort

There is no known risk or harm related to participating in this study. However, this program may make you spend your time with us. Moreover, there is neither cost nor payment to your participation in this study.

Benefits

The finding of this study will provide benefits to the nurses and other health care providers in order to provide the self-efficacy enhancing education program to enhance family caregiver's competencies in caring for patients with mild traumatic brain injury. The data from this study will be used to write research paper. It also will provide useful information for further research in this area.

Confidentiality

All information and your personal identity will be kept confidential and anonymous. I will use a code number so that your identity will not be discovered

and all information will be used just for the report of the study. Finally, the questionnaires will be destroyed after completion of the study.

Participation and withdrawal from participation

Participation in this study is voluntary. Signing the informed consent or agreeing verbally to participate indicates that you understand what is involved and you consent to participate in this study. You have the right to withdraw from participation anytime without any problems prior to completion of data collection.

Finally, if you have any questions or suggestions, you can contact directly to me by phone +6281328737805 or send email to fifinku_jogja@yahoo.co.id. If you agree to participate in this study, please sign your name on the consent form.

Thank you very much for your consideration to participate in this research study.

Erfin Firmawati

Researcher

Informed Consent Form

Title Self-Efficacy enhancing Education Program on Family Caregivers’
Competency in Caring for Patients with Mild Traumatic Brain Injury in
Yogyakarta, Indonesia

Researcher Erfin Firmawati (Master Student of Faculty of Nursing, Prince of
Songkla University, Hatyai, Thailand)

Family’s name:.....Age:.....

Family’s consent

I, was informed of the detail of the research entitled “Self-Efficacy enhancing Education Program on Family Caregivers’ Competencies in Caring for Patients with Mild Traumatic Brain Injury in Yogyakarta, Indonesia” and was assured that no part of my personal information and research result may be individually revealed to the public. If any problem or issues occur, I will discuss with the researcher. I have right to withdraw from this program at any time without any effects on any nursing/medical service and treatment I must receive. I am willing to participate in this research project voluntarily and hereby endorse my signature.

Given by :..... Date :.....

Researcher note:

I provided the detailed information of the research entitled “Self-Efficacy enhancing Education Program on Family Caregivers’ Competencies in Caring for Patients with Mild Traumatic Brain Injury in Yogyakarta, Indonesia” to the family caregiver. I give the opportunity to the family caregiver to ask any question and give the required answer.

Signature: (Researcher)

Date :

Research Information Sheet
Self-Efficacy enhancing Education Program

If you are in the program, I will initiate the following procedures:

1. During hospitalization
 - a. You will be asked to fill some forms including the demographic data and Perceived Confidence Questionnaire that will
 - b. You will receive a self-efficacy enhancing education program to help you to increase your competencies in caring for patients with mild TBI.

2. The first week after discharge

In this period, the researcher will conduct the phone calls follow-up to evaluate your progress report related to

3. The second weeks after discharge

In the last week of the study, you will receive the same activities with the first week after discharge. The research assistance will

.....

APPENDIX D

Patient Demographic Data Questionnaire (PDDQ)

Participant ID :

Date and time :

Phone number :

Instruction

The following items are some information about yours self. Please answer by marking (√) in the available space or filling in the blank that is appropriate for you.

Participant information

Participant information

1. Age : years
2. Gender: (1) Female (2) Male
3. Marital status: (1) Married (2) Single
 (3) Widowed (4) Divorced
4. Level of education: (1) No schooling (2) Elementary school
 (3) Junior high school (4) Senior high school
 (5) College/ University
5. Occupation: (1) None (2) Retired
 (3) Government employee

APPENDIX E**Injury Characteristics (IC)**

Cause of mild TBI:

- (1) Body assault (2)
- (3) Bicycle accident (4) Falling injury
- (5) Car accident (6)
- (7) Other.....

Admission GCS score:

- (1) 13 (2) 14 (3) 15

Discharge GCS score

- (1) 13 (2) 14 (3) 15

Confusion or disorientation:

- (1) No (2) Yes

Duration of hospitalization:

- (1) 1 day (2)
- (3) 3 days (4) Other.....

Other injuries sustained at the time of this injury:

- (1) No (2) Yes

APPENDIX F

Rivermead Post-concussion Symptoms Questionnaire (RPSQ)

Name :

Date:

We would like to know if you now suffer any symptoms given below. We would like you to compare yourself now with before the accident (i.e., over the last 24 hours).

For each symptom listed below please circle the number that most closely represents your answer.

Symptom		Not present	Yes present
Physical	Headache	0	1
	Feeling or dizziness	0	1
	.....	0	1
	Noise sensitivity (easily upset by loud noise)	0	1
	Sleep disturbance	0	1
	.....	0	1
	Blurred vision	0	1
	Double vision	0	1
	Restlessness	0	1
	.....	0	1
Emotion	Feeling frustrated or impatient		1
	Irritability/ easy to anger	0	1
Cognitive	Difficulty remembering	0	1
	Poor concentration	0	1
	Taking longer to think	0	1
Other.....		0	.....

APPENDIX G

Perceived Confidence Questionnaire (PCQ)

Code :
Date :

Instruction: The following statements represent how much you are confident to provide care for your patient (loved one/relative, e.g. your daughter/son/father/mother). Please indicate the level of your confidence by marking (√) in the appropriate column that best represent if you agree or disagree to that statement.

Note:

- 1: High confidence
- 2: Moderate confidence
- 3: Low confidence
- 4: No confidence

No	Statements	Confidence level			
		1	2	3	4
Confidence to assess of warning signs or symptoms of increased intracranial pressure (the following signs and symptoms are significant to send patient back to hospital)					
1.	I am confident to assess the level of consciousness				
2.	I am confident to assess the constant headache and/or severe headache				
....				
6.	I am confident to assess the continual fluid or bleeding from the ears or nose				
Confidence to assess the other persistent symptoms to be managed after mild TBI					
7.	I am confident to assess the symptom of headache				
8.	I am confident to assess the symptom of dizziness				
9.	I am confident to				

10.	I am confident to assess the symptom of difficulty remembering				
Confidence to manage/prevent of complication					
11.	I am confident to transfer patient back to hospital when I detect any warning signs of increased intracranial pressure.				
....				
15.	I am confident to cover the ear or nose with clean gauze when he or she has continual fluid/discharge or bleeding				
Confidence to manage the symptoms after mild TBI					
...				
19.	I am confident to manage of difficulty remembering				
Symptom evaluation					
20	I am confidence to evaluate headache symptom following mild TBI after I provide care				
...				

APPENDIX H
Performance Questionnaire (PQ)

Code :
Date :

Instruction: This questionnaire is to ask you about care you gave to your patient (loved one/relative, e.g. your daughter/son/father/mother) during the past week.

Part I: Please mark (√) if your patient had experienced the following symptoms.

Please mark all that apply.

No	Symptoms had been experienced by your patient	Yes	No
1.	Warning signs and symptoms during three days after discharge: a. Decrease level of consciousness b. Constant of headache and/or severe headache c. Vomiting projectile d. Seizure e. Continual fluid or bleeding from the ears or nose		
2.	Symptoms following mild TBI		
	a. Headache		
	b. Dizziness		
	c. Fatigue		
	d. Difficulty remembering		
	e. Other symptom (specify).....		

Part II: Please respond to the questions asking things you have done for your patient **over the past week** by marking (√) in the appropriate column that best represent how often you performed each action.

Note

- 1: Never
- 2: Rarely (1-2 times/ week)
- 3: Sometime (3-4 times/ week)
- 4: Often (5-6 times/ week)
- 5: Regular (every day)

No	Statements	Performance				
		1	2	3	4	5
1.	I assess the warning signs					
2.	I assess the symptom of headache					
3.	I remind the patient to take medication (analgesic) or giving medication to the patient when patient get headache					
....					
....					
19.	Did you assess the patient's progress (was better or worse after you provided care)					

Part III

Please respond to the questions asking things you have done for your patient **over the past week** by marking (√) in the appropriate column.

No	Statements	Yes	No
1.	Did you transfer the patient to the hospital when any of warning signs and symptoms occurred		
2.	Did you consult nurse/doctor/other health care provider when the patient getting worse		

APPENDIX I

Self-Efficacy enhancing Education Program Guideline

No	Topic	Duration Place	Method	Activities	
				Researcher	Participant
1	Introduction	3 minutes Patients' ward	Discussion	Explain the purpose of the program	Actively participate in the session
2	Exploring the family caregiver's feelings about	5 minutes	Discussion	Ask the family caregiver to explore their feeling about caring for patient with mild TBI - What is your feeling related to caring for your relative? -	Actively participate in the session Explore their feeling and her or his problem related to providing care for patient.
3	Teaching and (Verbal Persuasion)	15 minutes Patients' ward	Discussion	The researcher will provide information regarding definition of mild TBI, symptom of mild TBI and warning sign, and The researcher will ask family caregiver -	Teaching session: - Listen carefully and pay attention while the researcher explained - Answer of each question -

4	Demonstration and re-demonstration (Enactive Mastery experiences)	15 minutes Patients' ward	Demonstration, re-demonstration, and discussion	<p>The researcher will demonstrate about symptom assessment </p> <p>The researcher will ask some questions to family caregiver</p> <ul style="list-style-type: none"> - Do you have any questions after I showed - What have you learned from this demonstration? - Is there anything that makes you more - Is it easy skills to perform or not? - Do you willing to practice? - Are there any difficulties that influence your practice? <p>Researcher will ask family caregiver to re..... </p>	<ul style="list-style-type: none"> - Listen carefully and pay attention while the researcher explained - Family caregiver ask some questions - Answer of each question - Mention about - Mention about her or his difficulties to practice - The family caregiver presents the opinion how..... - Family caregiver re-demonstrates
5	Sharing information about success of symptoms management	23 minutes Patients' ward	Discussion	<p>Researcher will share information about success of symptoms management and show some pictures related to management of mild TBI;</p>	<ul style="list-style-type: none"> - Listen carefully and pay attention while the researcher explained - Family caregiver ask some questions - Answer of each question

	<p>.....</p>			<p>.....</p> <p>.....</p> <p>Researcher will ask some questions to family caregiver:</p> <ul style="list-style-type: none"> - Do you have any question after I shared some information and - What have you learned after looked the pictures? - Is it easy skills to perform or not? - Do you willing to practice? - Are there any difficulties that influence your practice? - <p>The researcher will make appointment for next week via</p> <ul style="list-style-type: none"> - When do you have the available time for next week? - If you have any progress or problem during provide care 	<ul style="list-style-type: none"> - Mention about - Mention about their difficulties to practice - The family caregiver presents the opinion how - Family caregiver re-demonstrates symptoms assessment and symptom management: - Family caregiver explore her or his confident to provide care for the patient with mild TBI.
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				to the patient,	
6	Telephone follow up one week and	15 minutes	Discussion	The researcher will ask family caregiver what family has been done to the patient. - Please tell me, how is your progress in last week regarding	- The family caregiver responses actively - The family caregiver tells about their competency to - The family caregiver explains

APPENDIX J

Teaching Plan for Self-Efficacy enhancing Education Program

Session	Topic	Objectives	Content	Method/Media/ Time	Activities	
					Researcher	Participant
1	Introduction	To prepare family caregiver to follow	General introduction about a self-efficacy enhancing education program	Discussion (5 minutes)	Explain about the purposes of education program, content, and duration. Ask the question	- Listen carefully - Pay attention - - Ask the question - Provide comments
2	Exploring the family caregiver's feelings about	To decrease stress, anxiety and help	Exploring of family caregivers' feelings	Discussion (5 minutes)	Ask the family caregiver to convey her or his feeling about caring for patient with mild TBI	- Convey his or her feeling related to
2	Mild TBI overview	To improve the family's knowledge regarding mild	Mild TBI is an acute brain injury resulting from mechanical energy to the head from external physical forces, signed by confusion or	Discussion Booklet (10 minutes)	- Explain to the family caregiver regarding	- Listen carefully - Ask some questions - Answer the

Session	Topic	Objectives	Content	Method/Media/ Time	Activities	
					Researcher	Participant
		TBI: definition, mild TBI symptom and	<p>disorientation, loss of consciousness for</p> <p>.....</p> <p>Symptom following mild TBI consists of three symptoms; physical (headache, dizziness, nausea or vomiting, fatigue, and sleep disturbance), cognitive: (difficulties to remember and concentration), and emotional (irritability, anger, and frustration)</p> <p>Warning signs: Warning signs is signs that related to the increased intracranial pressure (IICP). The signs and symptoms of increased intracranial pressure are</p> <p>headache, vomiting projectile repeatedly, seizure, paralysis on one or more sides of body, and bleeding/drainage from nose or ear.</p>		<p>definition of mild TBI, symptom and warning sign, impact, and</p> <p>.....</p> <ul style="list-style-type: none"> - Give opportunity for family caregiver to ask or - Ask questions related to discussion - Answer family's questions 	<p>questions</p> <ul style="list-style-type: none"> - Provide comments

Session	Topic	Objectives	Content	Method/Media/ Time	Activities	
					Researcher	Participant
			Management symptoms: Headache management (maintain regular exercise, massage therapy, neck stretches and Memory difficulties Anger/irritability			
3	Symptoms assessment	To improve family's knowledge and skill about symptom assessment	Symptom assessment using symptom checklist: - Assess the symptom every day - Assess the warning sign The warning signs such as patients become unconsciousness, worsening headache/severe headache, vomiting projectile repeatedly,	Discussion Demonstration Re-demonstration symptom assessment using symptom checklist 15 minutes	<ul style="list-style-type: none"> - Explain to the family caregiver regarding symptoms and - Demonstrate about assessment of symptom - Give opportunity for - Ask questions 	<ul style="list-style-type: none"> - Listen carefully and pay attention - Ask some questions - Answer the questions - Provide comments - Re-demonstrate the symptom assessment

Session	Topic	Objectives	Content	Method/Media/ Time	Activities	
					Researcher	Participant
					<ul style="list-style-type: none"> related to - Answer - Ask family caregiver to - Provide reinforcement 	
4	Symptoms management	To improve family's knowledge and	<p>Management symptom following mild TBI: Management of headache When your patient has headache:</p> <ul style="list-style-type: none"> a. Reminding the patient to perform deep breathing or teach the patient to do it b. Reminding c. Reminding to take medication (analgesic) or giving medication to the patient such as Paracetamol <p>To prevent headache:</p> <ul style="list-style-type: none"> a. Encouraging the patient to do regular exercise: 	Discussion Demonstration Re-demonstration symptom management 15 minutes	<ul style="list-style-type: none"> - Explain to the family caregiver regarding - Demonstrate about symptom management neck stretching, sleep position, and deep breathing 	<ul style="list-style-type: none"> - Listen carefully and pay attention - -

Session	Topic	Objectives	Content	Method/Media/ Time	Activities	
					Researcher	Participant
			<p>.....</p> <p>.....</p> <p>b. Encouraging or providing the appropriate sleep position</p> <p>c. Encouraging patient to avoid caffeine</p> <p>Management of dizziness</p> <ul style="list-style-type: none"> - Reminding to take - Reminding and/or helping the patient to move/change position slowly - - Encouraging or providing food with low salt <p>Management of fatigue</p> <p>a. Encouraging the patient:</p> <ul style="list-style-type: none"> - to get enough sleep and rest - to do exercise: range of motion - <p>b. Helping and/or preparing the patient of</p> <p>.....</p>		<ul style="list-style-type: none"> - Give opportunity for family caregiver to - Ask questions related to demonstration - Answer family's questions - Ask family caregiver to - Provide reinforcement 	

Session	Topic	Objectives	Content	Method/Media/ Time	Activities	
					Researcher	Participant
			Management of difficulty of remembering a. Helping the patient to practice remembering: b. Encouraging and/or helping the patient: - to make daily planners - to use devices to help			
5	Symptoms evaluation	To improve family's	Evaluate symptoms after providing care to the patients related to	Discussion 5 minutes	- Explain to the family caregivers regarding - -	- - -
6	Sharing information about.....	To improve family's knowledge and skill about	The vestibular exercises were provided to the patients ..... .....	.....	- Explain to the family caregiver regarding - Give opportunity to	- Listen carefully and pay attention - Ask some questions - Answer the questions -

Session	Topic	Objectives	Content	Method/Media/ Time	Activities	
					Researcher	Participant
					family caregivers to - Answer family's questions	

APPENDIX K

Booklet



FAMILY CAREGIVERS
&
MILD TBI PATIENT
BOOKLET

By

Erfin Firmawati

Master of Nursing Science
Prince of Songkla University
Thailand

Introduction

This booklet aims to provide information about management of mild TBI. It helps family caregivers about management for your patients with mild TBI. It consists of definition of mild TBI, what family caregivers should do to care the patients with mild TBI after discharge, warning signs and symptoms following mild TBI, headache management, dizziness management, fatigue management, and difficulty in remembering management.

Mild Traumatic Brain Injury

Definition of mild TBI

Mild traumatic brain injury is an acute brain injury resulting from mechanical energy to the head from external physical forces with criteria confusion or disorientation, loss of consciousness for 30 minutes or less, post traumatic amnesia for less than 24 hours.

What family caregivers should do to care the patient with mild TBI after discharge from the hospital?

- a. Caring for symptom assessment
- b. Caring for symptom management
- c. Caring for symptom evaluation

Caring for symptom assessment

Family caregivers help patient with mild TBI by assess symptoms after discharge from hospital that is to identify the symptom of warning signs of increase intracranial pressure especially during one week after discharge and symptoms following mild TBI.

Warning Signs & Symptoms

Warning signs are signs that related to increased intracranial pressure. You as family caregivers should pay attention to observe or monitor the patient's condition within one week and two weeks after discharge from hospital

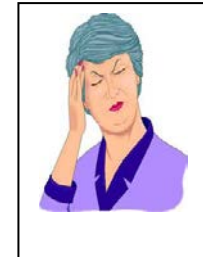
Symptoms following mild TBI

Physical symptoms	Cognitive symptoms	Emotional symptoms
Headache Dizziness Fatigue (loss of energy/ getting tired easily) Nausea Vomiting Tinnitus Sleep disturbance Blurred vision Double vision Light sensitivity	Difficulty concentrating Difficulty remembering Taking longer to think	Irritability Depression Aggression Anger

Headache is one of the common symptoms after mild traumatic brain injury

The types of headache after mild TBI

1. Migraine headache
 This type has the following features: dull, throbbing sensation, usually on one side of the head, sometimes accompanied by nausea or vomiting.
2. Tension-type headache
 This type has the following features tight, squeezing sensation, often around the entire head or both sides.



How to manage headache?

When your patient has headache:

- a. Reminding the patient to perform deep breathing or teach the patient to do it
- b. Reminding the patient to perform massage or provide massage to the patient
- c. Reminding to take medication (analgesic) or giving medication to the patient such as Paracetamol

To prevent headache:

- a. Encouraging the patient to do regular exercise: perform neck stretching, range of motion (ROM)
- b. Encouraging or providing the appropriate sleep position
- c. Encouraging patient to avoid caffeine

Management of dizziness

Your patient feels loss of balance if she/he move or change position quickly.



How family caregivers help patient with dizziness symptom?

- Reminding to take medication or giving medication to the patient
- Reminding and/or helping the patient to move/change position slowly
- Encouraging and/or guiding the patient to perform: vestibular exercise
- Encouraging or providing food with low salt

Vestibular Exercises



Steps of vestibular exercise

1. Start by sitting upright in bed
2. Turn head to the left
3. Lie back
4. Turn head to the right
5. Roll over to the right side
6. Sit up straight again
7. Repeat in the opposite
8.

You help and/or encourage the patient to do vestibular exercise before bedtime. If your patient gets worse of dizziness after conduct the exercise, please consult to the doctor/nurse.

Management of fatigue

Your patient feels losing of energy and/or getting tired easily



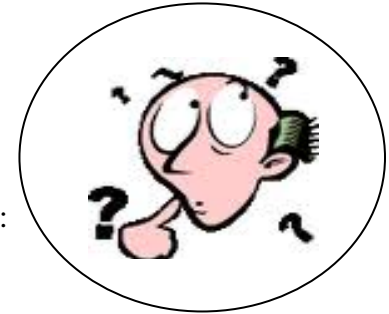
How family caregivers can help the patient to manage of fatigue symptom?

1. Encouraging the patient:
 - to get enough sleep and rest
 - to do exercise: range of motion
 - to set a regular schedule between activity and rest
2. Helping and/or preparing the patient of the adequate meals and drinks

Management of difficulty remembering

How family caregivers help the patient to manage this symptom?

- Helping the patient to practice remembering: place, name, time, event in the current day or previous day
- Encouraging and/or helping the patient:
 - to make daily planners
 - to use devices to help remembering: mobile phone, calendar, diary



Making daily planner



Using calendar

Warning Signs (increased intracranial pressure)

Symptom	Day		Day		Day		Day		Day		Day		Day	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Unconsciousness														
Severe headache														
Vomiting projectile														
Seizure														
Weakness/paralysis one or more sides of body														
Bleeding or drainage from ear or nose														

Symptom	Day		Day		Day		Day		Day		Day		Day	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Unconsciousness														
Severe headache														
Vomiting projectile														
Seizure														
Weakness/paralysis one or more sides of body														
Bleeding or drainage from ear or nose														

Symptom	Day															
	Sunday				Monday				Tuesday				Wednesday			
	Symptom		Management		Symptom		Management		Symptom		Management		Symptom		Management	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	No
Headache <ul style="list-style-type: none"> Encouraging the patient to perform regular exercise: neck stretching Encouraging and/or providing the appropriate sleep position Reminding the patient to take medication (analgesic) or giving medication to the patient when patient get headache 																
Fatigue <ul style="list-style-type: none"> Encouraging and/or helping the patients to perform exercises Encouraging and/or monitoring and/or reminding the patient to get enough sleep Monitoring and/or helping the patient has adequate meals and drinks 																
Dizziness <ul style="list-style-type: none"> Encouraging and/or helping to do vestibular exercise Reminding or helping the patient to move/change position slowly Reminding the patient to take medication and/or giving medication to the patient when patient get dizziness 																
Difficulty in remembering <ul style="list-style-type: none"> Practice remembering: asking the patient about time, place, and person Encouraging and/or helping the patient to make daily planners Encouraging and/or helping the patient to use devices to help remembering: mobile phone, calendar, diary 																

APPENDIX L

List of Experts

Three experts examined the content validity of the instruments including the intervention program, teaching plan and booklet, the Rivermead Post-concussion Symptom Questionnaire, the Perceived Confidence Questionnaire, and the Performance Questionnaire, they were:

1. Dr.Prapan Somporn, M. D
Nerosurgeon, Hatyai Hospital, Thailand
2. Miss Jintana Damkliang
Nursing Lecturer, Surgical Nursing Department, Faculty of Nursing,
Prince of Songkla University, Thailand
3. Narumon Anumas
APN Neurosurgical intensive care, Hatyai Hospital, Thailand

APPENDIX M

Permission of the Instrument

RE: Asking permission for using Rivermead Postconcussion Symptom Questionnaire Sembunyikan Detail
 Dari: Nigel King
 Ke: erfin firmawati

Yes it is fine to use the questionnaire.

Good luck with your research.

Kind regards.

Dr Nigel King

From: erfin firmawati [mailto:fifinku_jogja@yahoo.co.id]

Sent: 16 May 2013 04:39

To: Nigel King

Subject: Asking permission for using Rivermead Postconcussion Symptom Questionnaire

Dear Dr Nigel King

First of all, I would like to introduce my self. My name is Erfin Firmawati, I am a master student at Nursing Faculty, Prince of Songkla University, Thailand.

Now, I am doing my thesis entitle "The effect of Self-Efficacy Enhancing Education Program on Family Caregivers' Competencies in Caring for Patientswith Mild Traumatic Brain Injury".

In my study,I would like to use the Rivermead Postconcussion Symptom Questionnaire to assess the patients' symptoms with mild TBI.

This questionnaire is very usefull and helpfull for my study.

Furthermore, I would like to publish my study in the journal of trauma.

Dr Nigel King, I would like to ask You to give me permission to use your questionnaire.

Hopefully, Dr Nigel King would like to give me permission.

Thank You very much

Best regard

Erfin Firmawati

Master student, Faculty of Nursing, Prince of Songkla University, Thailand

My Advisor: Assoc.Prof.Dr.Praneed Songwathana, RN,Phd.

emaild address:spraneed@yahoo.com

VITAE

Name Erfin Firmawati

Student ID 5410420023

Educational Attainment

Degree	Name of Institution	Year of Graduation
Bachelor of Nursing	School of Nursing, Faculty of Medicine and Health Science Muhammadiyah University of Yogyakarta	2006

Scholarship Awards during Enrollment

2011 – 2013 Directorate General of Higher Education, Ministry of National
Education of Indonesia

Work – Position and Address (If Possible)

Work position Lecturer of School of Nursing, Faculty of Medicine and Health
Science, Muhammadiyah University of Yogyakarta

Address Jl. Lingkar Selatan, Tamantirto, Kasihan, Bantul, Yogyakarta,
Indonesia

Phone +62274387656

Email fifinku_jogja@yahoo.co.id

List of Publication and Proceeding

Firmawati, E., Songwathana, P., & Kitrungrrote, L. (2013). A pilot study of self-efficacy enhancing education program on family caregivers' competencies in caring for patients with mild traumatic brain injury. The 2013 International Conference on Health & Harmony, Nursing Values, Phuket Orchid Resort and Spa, Thailand, May 1-3, 2013.