FACTORS INFLUENCING ON QUALITY OF LIFE AMONG PATIENTS WITH TRAUMATIC BRAIN INJURY

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ABSTRACT

The purpose of this descriptive research was to examine quality of life among patients with traumatic brain injury and factors influencing the quality of life among these patients. The participants were 111 patients with traumatic brain injury and the family caregivers who accompanied them to the follow-up clinic at the Neurosurgical Clinic, Out-Patient Department, Chachoengsao Hospital, Chonburi Hospital and Rayong Hospital. Data were collected from January to March 2003. Statistical analysis used were descriptive statistics, Pearson's product moment correlation, and stepwise multiple regression.

The majority of patients were male (79.3%) with an average age of 34.5 years. Traffic accidents were the leading cause of injury (89.2%). Forty-one percent of them were diagnosed with subdural hematoma, 69.4% had a post concussion period duration of less than 6 months, 30.7% were in level 6 of the GOSE, and 50.5% had communication problem. The family caregivers were female (88.3%) with an average age of 44.19 years. They were the parents or spouses of the patients. More than half of them (64.9%) had an average family income of less than 10,000 baht per month and only 27.0% had sufficient income with savings. The factors that were related to quality of life were disability level, capability of family caregiver and sufficient family financial status. The stepwise multiple regression analysis showed that disability level, capability of family caregiver, and sufficient family financial status could explain the variation in the quality of life among patients with traumatic brain injury by 74.8% ($p < .01$).

In order to promote quality of life in patients with traumatic brain injury, effective care to foster recovery process, an intervention to promote family caregivers' capabilities, and a strategy to provide patients' family with essential resources are strongly recommended.

KEY WORDS : QUALITY OF LIFE / TRAUMATIC BRAIN INJURY / FAMILY CAREGIVER / DISABILITY

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ปัจจัยที่มีอิทธิพลต่อคุณภาพชีวิตของผู้ป่วยบาดเจ็บที่สมอง (FACTORS INFLUENCING ON QUALITY OF LIFE AMONG PATIENTS WITH TRAUMATIC BRAIN INJURY)

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บทคัดย่อ

การศึกษาครั้งนี้เป็นการวิจัยเชิงบรรยาย เพื่อศึกษาคุณภาพชีวิตของผู้ป่วยบาดเจ็บที่สมอง และปัจจัยที่มีอิทธิพลต่อคุณภาพชีวิตของผู้ป่วยบาดเจ็บที่สมอง กลุ่มตัวอย่างคือผู้ป่วยบาดเจ็บที่สมอง และญาติผู้ดูแลที่พาผู้ป่วยมารับการตรวจรักษาที่คลินิกศัลยกรรมประสาท แผนกผู้ป่วยนอก โรงพยาบาลเมืองฉะเชิงเทรา โรงพยาบาลชลบุรี และโรงพยาบาลระยอง จำนวนทั้งสิ้น 111 ราย เก็บข้อมูลโดยการสัมภาษณ์ ตั้งแต่เดือนมกราคม ถึงเดือนมีนาคม พ.ศ. 2546 วิเคราะห์ข้อมูลโดยใช้สถิติพรรณนา สัมประสิทธิ์สหสัมพันธ์ของเพียร์สัน และการวิเคราะห์ถดถอยพหุแบบขั้นตอน

ผลการศึกษาพบว่าผู้ป่วยบาดเจ็บที่สมองส่วนใหญ่เป็นเพศชาย (79.3%) วัยผู้ใหญ่ อายุเฉลี่ย 34.5 ปี สาเหตุสำคัญที่ทำให้เกิดการบาดเจ็บที่สมอง คือ อุบัติเหตุจราจร (89.2%) ส่วนใหญ่ได้รับการวินิจฉัยโรคว่ามีก้อนเลือดออกใต้ชั้นดูรา (41%) มีระยะเวลาหลังการบาดเจ็บน้อยกว่า 6 เดือน (69.4%) ระดับความพิการซึ่งประเมินโดยแบบวัดผลลัพธ์กลาสโกลว์ อยู่ในระดับ 6 (30.7%) และมีปัญหาด้านการสื่อสาร (50.5%) ญาติผู้ดูแลส่วนใหญ่เป็นเพศหญิง (88.3%) วัยกลางคน อายุเฉลี่ย 44.19 ปี มีความสัมพันธ์เป็นภรรยาหรือมารดาของผู้ป่วย ครอบครัวของผู้ป่วยส่วนใหญ่มีรายได้เฉลี่ยต่อเดือนน้อยกว่า 10,000 บาท (64.9%) ปัจจัยที่มีความสัมพันธ์กับคุณภาพชีวิตของผู้ป่วยบาดเจ็บที่สมอง ได้แก่ ระดับความพิการของผู้ป่วย ความสามารถของญาติผู้ดูแล และฐานะทางเศรษฐกิจของครอบครัว ซึ่งปัจจัยดังกล่าวสามารถร่วมกันอธิบายความผันแปรของคุณภาพชีวิตของผู้ป่วยบาดเจ็บที่สมองได้ 74.8% ($p < .01$)

จากผลการวิจัยมีข้อเสนอแนะว่า บุคลากรในทีมสุขภาพต้องให้การดูแลผู้ป่วยบาดเจ็บที่สมองอย่างมีประสิทธิภาพ เพื่อลดภาวะแทรกซ้อนหรือความพิการที่อาจเกิดขึ้น มีการจัดโปรแกรมเพื่อส่งเสริมความสามารถของญาติผู้ดูแล รวมทั้งส่งเสริมให้ครอบครัวของผู้ป่วยบาดเจ็บที่สมองได้เข้าถึงแหล่งประโยชน์ทางด้านสุขภาพและด้านสังคมที่มีอยู่ ซึ่งจะส่งผลให้ผู้ป่วยมีคุณภาพชีวิตที่ดี

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CHAPTER I
INTRODUCTION

Background and Significance of the Study

Traumatic brain injury (TBI) is one of the most common consequences of traffic accidents in Thailand. According to recent epidemiology data, traumatic brain injury is the most severe injury when compared with other injuries (Chuprapawan, J., 2000: 216, The Epidemiology Department, Ministry of Public Health, 2002). Although the transportation law related to the wearing of safety helmets, and the safety belts was enforced, starting January 1, and October 7, 1996, respectively, the traffic accident rate and numbers of patients from accidents had been growing. As a result, the number of victim from traumatic brain injury also was rising. According to the statistic from Medical Registration and Statistical Department of Chachoengsao Hospital, Chonburi Hospital, and Rayong Hospital in 2001, the number of patients with traumatic brain injury who came for a follow-up at the Neurosurgical Clinic, Out-Patient Department were 1,443, 3,478 and 2,190, respectively. Furthermore, the Injury Surveillance Report the network hospitals at the provincial level, Epidemiology Department, Minister of Public Health (2002), Chonburi Hospital had the highest number of patients from accidents rate in eastern region of Thailand.

The acquisition of traumatic brain injury has profound effects upon the individual and their families. Currently, a greater chance for survival may be resulted from the advance in medical and nursing technology. The majority of patients in an acute phase of brain injury received effective care (Brooks, et al., 1997: S26; Carson, 1993: 255). However, the survivals from traumatic brain injury always sustain several health deterioration and suffer from long-term disabilities (Lovasik, et al., 2001: 24-25). These problems require a prolonged time in therapy, as well as an adequate long-term rehabilitation and support (Grzankowski, 1997: 24).

Traumatic brain injury creates a direct impact on patients' lives. Patients with traumatic brain injury often suffer from physical problems, cognitive problems,

emotional problems, behavioral problems, and social problems. All of these can be described in term of "quality of life (QOL)" (WHO, 1947 cited in Mc.Sweeny & Creer, 1995). Therefore, it can be considered that patient after traumatic brain injury experience decreased quality of life.

On reviewing the research about quality of life among patients with traumatic brain injury in Thailand. There is only the study of Ngaochin, T. (1999) that was conducted in patients with traumatic brain injury who received opened skull surgery, remained mild to moderate disability, did not have cognitive impairment, were able to respond to the questions and were able to give opinion about themselves. However, this study had some limitation because patients who were recruited into the study were ones who possessed relatively good health and normal communication ability. The study could not represent the majority of traumatic brain injury patients because patients who had impaired cognitive functions or had communication deficit were excluded.

As a result of literature review, it was revealed that there were three significant factors that related to quality of life among patients with traumatic brain injury including disability level (Kreuter, et al., 1998; Webb, et al., 1995), capability of family caregiver (Potaya, S., 2001; Ya-orm, Y., 2001), and family financial status (Namasa, A., 2002, Webb, et al., 1995). These factors could be categorized into two major groups: individual and environmental factors. Disability level could be categorized into individual factors, while capability of family caregiver and family financial statuses could be categorized into environmental factors. Evidences to support are briefly described as follows.

In the study of Webb and colleagues (1995), disability level had negative correlation with the quality of life among patients with traumatic brain injury ($r = -.31$, $p < .01$). In addition, the disability level had indirect correlation with the quality of life among the patients, and had negative correlation with return to work of the patients ($r = -.26$, $p < .05$). While, return to work had the positive correlation with the quality of life ($r = .35$, $p < .01$). According to the study of Schwab and colleagues (1993) indicted that disability level could explain the variation of return to work, which was considered as a dimension of quality of life among patients with traumatic brain injury by 42%.

The study of Webb and colleagues (1995) revealed that family financial status had indirect correlation with the quality of life among patients with traumatic brain injury; the families with good financial status could provide patients with long-term rehabilitation, which increased patient's ability to help themselves. The patients' ability to help themselves had positive correlation with their quality of life ($r = .22$, $p < .05$). In addition, the study of Namasa, A. (2002) showed that family financial status had positive correlation with health status of patients with traumatic brain injury ($r = .23$, $p < .01$) especially, among traumatic brain injury patients who were very ill and were depended on family caregivers.

In the study of Steadman-Pare and colleagues (2001), emotional support and economy support had positive correlation with quality of life among patients with traumatic brain injury ($r = .25$, $p < .01$; $r = .13$, $p < .05$, respectively). Moreover, the study of Potaya, S. (2001) and Ya-orm, Y. (2001) indicated that patients who received direct physical and emotional support from their family caregiver would increased their ability to help themselves, which had positively associated with quality of life ($p < .05$) as mentioned before (Webb, et al., 1995).

The researcher believed that quality of life in patients with traumatic brain injury was a significant topic that need to be studied to clearly describe what is the overall quality of life among these patients, because quality of life is widely recognized as an important indicator of health outcomes (DePalma, 2001: 42; Ingersoll, et al., 2000: 1272; Puavilai, A., 2000: 20). Understanding factors that influence quality of life among traumatic brain injury patients was also essential because it could help nurses in developing an appropriate nursing regimens to promote quality of life among these patients.

Research Questions

1. What was the quality of life among patients with traumatic brain injury?
2. How did disability level, capability of family caregiver, and family financial status influence quality of life among patients with traumatic brain injury?

Purposes of the Study

1. To study quality of life among patients with traumatic brain injury.
2. To study the influence of disability level, capability of family caregiver, and family financial status on quality of life among patients with traumatic brain injury.

Conceptual Framework

This study was conducted on the basis of Transition theory (Schumacher & Meleis, 1994). Transition theory was appropriate to describe the quality of life among patients with traumatic brain injury, because this concept explained that an individual was involved in continuing change. As the patients with traumatic brain injury may also transit from a healthy person to an illness state after the accident. Receiving appropriate care and assistance from health care providers as well as family, patients would recover and transit through the health-illness continuum. A person who had a good transition process can transit to another stage easily and obtained good health outcomes or achieved good quality of life.

Base on Transition theory, the successes of transition are influenced by transition conditions including: 1.) Meaning; 2.) Expectation; 3.) Level of knowledge and skill; 4.) Level of planning; 5.) Emotional and physical well-being; 6.) The environment.

As a result of the literature review, it appears that the factors related to quality of life among patients with traumatic brain injury included disability level, capability of family caregiver, and family financial status. Disability level was categorized as physical well-being factors in transition conditions. Capability of family caregiver and family financial status were categorized as environment factors.

Based on Transition theory, the researcher has adopted the conceptual-theoretical-empirical structure of Fawcett & Downs (1992: 101-115) to connect the concepts of the theory with the variables and the scales used in the research as shown in Figure 1. Figure 2 depicted the conceptual framework portraying the relationship among variables in this study.

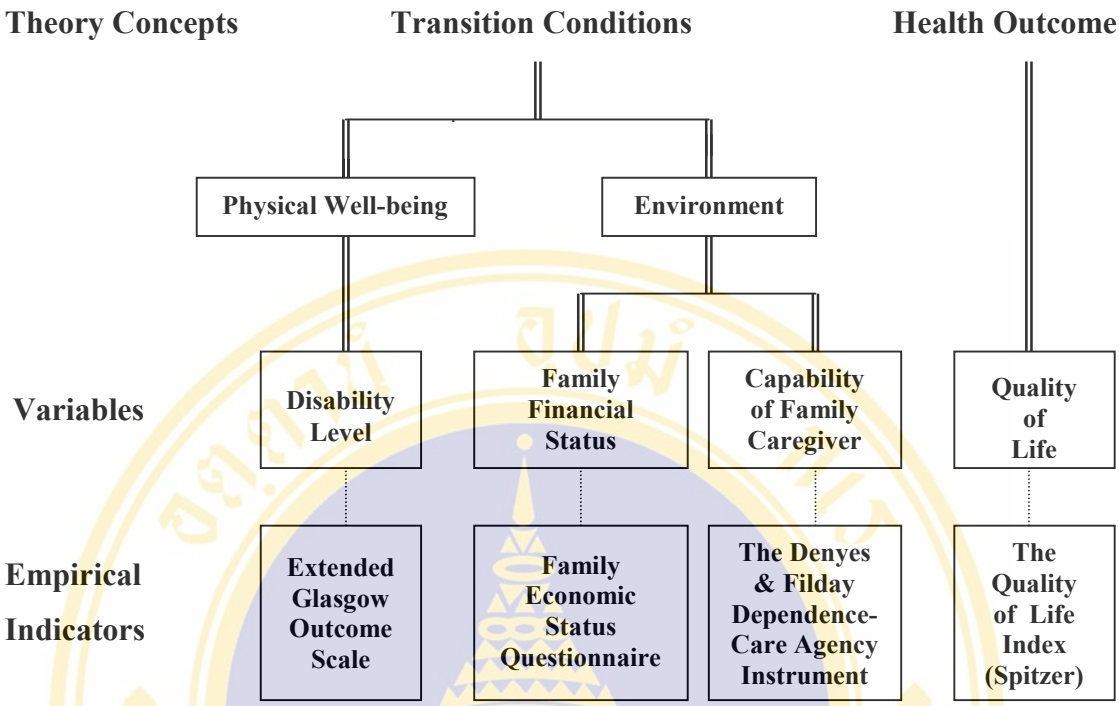


Figure 1 Conceptual framework of the relationship among the concepts in Transition theory, variables, and empirical indicators. (Utilizing the structure based on a Conceptual-theoretical-empirical structure of Fawcett & Down, 1992: 106-107)

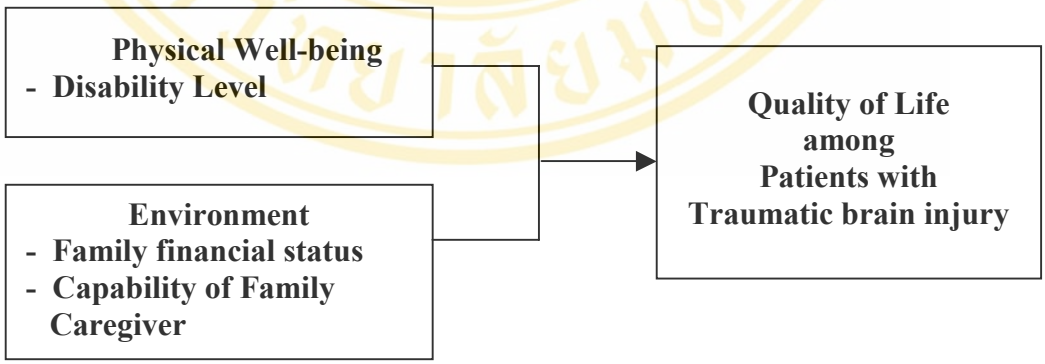


Figure 2 Conceptual framework presenting the relationship among variables in the study

Hypothesis

Disability level, capability of family caregiver, and family financial status are influencing on quality of life among patients with traumatic brain injury.

Scope of the Study

This study was a descriptive study, which aimed to examine quality of life among patients with traumatic brain injury and the influence power of disability level, capability of family caregiver, and family financial status on quality of life among patients with traumatic brain injury attending the Neurosurgical Clinic, Out-Patient Department of Chachoengsao Hospital, Chonburi Hospital, and Rayong Hospital. Data collection was conducted from January to March 2003.

Expected Outcomes and Benefits

1. For nursing practice

The results of this study could be applied as guidance for the development of a nursing regimens for improving quality of life among patients with traumatic brain injury. Also, it was expected that the results of this study could be used us as data for giving appropriate information to the patients and their families.

2. For nursing research

The results of this study could be guidance for the study of other issues that are related to quality of life among patients with traumatic brain injury and patients with other disabilities.

Assumption

The information from the family caregivers can reflect quality of life among patients with traumatic brain injury.

Definition of Terms

1. **Patients with traumatic brain injury** referred to a patient who had an accident resulting in brain injuries; had been discharged from the hospital and remained disabled, needed rehabilitation and received caregiving from family caregivers, and had scores on the Extended Glasgow Outcome Scale (GOSE) between 3-7.

2. **Quality of life among patients with traumatic brain injury** referred to the health status of patients with traumatic brain injury that involved physical, emotional and psychosocial dimension. In this study, it was measured by The Quality of Life Index (Spitzer), which was developed by Spitzer and colleagues in 1981.

3. **Disability level** was defined as overall health deterioration resulting from traumatic brain injury, which led patients to have cognitive and physical impairments at various levels. In this study, it was measured by the Extended Glasgow Outcome Scale (GOSE) that was developed by Wilson and colleagues in 1998.

4. **Capability of family caregiver** referred to the capability of family caregivers in providing care for patients with traumatic brain injury at home. This capability involved health knowledge, attention to health, ego strength and health decision-making capability, physical energy levels, feelings and value for health. In this study, it was assessed by the Denyes & Filday Dependent-Care Agency Instrument that was constructed by Denyes & Filday in 1986.

5. **Family financial status** referred to the perception of the family caregiver related to the sufficiency of income. In this study, it was measured by a single item question that was classified into three responses.

CHAPTER II
LITERATURE REVIEW

This study aimed to examine the factors influencing on quality of life among patients with traumatic brain injury. The literature review from theories and relevant research is presented on the following topics:

1. Impact of traumatic brain injury on the patients
2. Impact of traumatic brain injury on family and relatives
3. Health status of patients with traumatic brain injury as conceptualized through Transition theory
4. Correlations between physical well-being factors and environmental factors on quality of life among patients with traumatic brain injury
5. The quality of life assessment of patients with traumatic brain injury

Impact of Traumatic Brain Injury on the Patients

1. Incidence of traumatic brain injury

Traumatic brain injury is an acute life crisis and remains a significant public health problem because it causes a great loss in human resources and to the economy (Lovasik, et al., 2001: 36; Ngaochin, T., 1999: 7; Tepahudee, J. & Phuenpathom, N., 1999:110; Yooplao, R., 2000: 8).

The etiologies include traffic accidents, falls, assaults, and sport-related activities. Traffic accidents are the major causes of traumatic brain injury and death among people in Thailand (Assawapat, S., 1996: 72; Kijmahatrakul, A., 1999: 105; Namasa, A., 2002: 55-56; Ngaochin, T., 1999: 46; Potaya, S., 2001: 98; Poungbanhan, K., 1996: 1; Promkhuntong, K., 1997: 60; Tangchitvittaya, S., 1999: 100; Tepahudee, J. & Phuenpathom, N., 1999:111; Wirojanasangaroon, S., 1996: 139-140; Yooplao, R., 2000: 1). Risk behaviors for traumatic brain injury include the motorcycle drivers not

wearing safety helmets and drinking alcohol before driving (Petcharoen, N., et al., 1998: 855; Tangchitvittaya, S., 1999: 100; Wirojanasangaroon, S., 1996: 142-143).

From the epidemiological characteristic of patients, traumatic brain injury is more commonly found in males than females with a ratio of 2:1-5:1, 58.3-80.7% of casualties and 67% of deaths are aged under 40, with the highest incidence in young adults (15 to 29 years old). Most patients were married and had only graduated from primary school. The occupational group, which has the highest proportion of 26.8-41.1% in this kind of injury, is the manual labor group, followed by students (14.9-30%) and most of them have an average family income lower than 5,000 Baht per month (Assawapat, S., 1996: 69-70; Kijmahatrakul, A., 1999: 104-105; Namasa, A., 2002: 56; Ngaochin, T., 1999: 39-41; Potaya, S., 2001: 98; Poungbanhan, K., 1996: 2; Promkhuntong, K., 1997: 60; Samartkit, N. & Duangpaeng, S., 2001: 21; Tangchitvittaya, S., 1999: 99; Tepahudee, J. & Phuenpathom, N., 1999:111; Wirojanasangaroon, S., 1996: 139; Ya-orm, Y., 2001: 68).

2. Impact of traumatic brain injury on health status of patients

The brain is the regulatory and control organ of several systems in the body. After the brain was injured, patients would have problems in consciousness, body functions, memory, cognition and perception, emotions, behavior, and communication (Acorn & Roberts, 1992: 324; Stratton & Gregery, 1995: 323-327; Testani-Dufour, et al., 1992: 317-323; Valko, 1999: 271). In order to clearly understand the researcher reviewed and the presented impact of traumatic brain injury on health status of patients in the following topics:

2.1 Physical problems

Physical problems among patients with traumatic brain injury depend on the location and severity of the injury. These problems may improve or be restored within several periods following the injury, or they may be chronic or permanent in nature. The physical problems include:

2.1.1 Impaired physical mobility

Impaired physical mobility is usually found in patients with traumatic brain injury (Murrey, 2000: 16-17; The National Institutes of Health, 1999: 976; Valko, 1999: 271). It may result from weakness, paralysis, ataxia (characterized as a cluster of irregular, uncoordinated movements involving the extremities or the trunk), tremor (involuntary rhythmic movements with a frequency of three to five movements per second), and rigidity (defined as resistance to any type of movement independent of velocity).

The study of Mochizuki and Saito (1990) indicated that patients with lesions at the center of the frontal lobe always had hemiplegia. The study of Ivanhoe & Bontke (1996) indicated that some cases of ataxia result from the vestibular system, as damage to the basal ganglion could cause resting tremor, and rigidity is caused by damage to the extrapyramidal system (Ivanhoe & Bontke, 1996 cited in Valko, 1999). Rigidity is most common with severe traumatic brain injury, and onset is usually in the acute phase (Meythaler, et al., 1997: 415; O'Dell, et al., 1998: S11; Valko, 1999: 273). As a result, impaired physical mobility can significantly impair self-care skills (Valko, 1999: 271).

2.1.2 Post concussion seizures

This symptom can be found in patients with traumatic brain injury (Macciocchi, et al., 1993: 774; The National Institutes of Health, 1999: 976; Yablon, 1993: 983-1001). The risk of incidence depends on the severity of injury. In mild injuries, the incidence of seizures is 2% but is elevated to 50% in open injuries. The study of Yablon (1993) showed that the persons who had taken alcohol or tricyclic antidepressants, and the elderly with traumatic brain injury would have a higher risk of seizures, both in the generalized type (grand mal and tonic-clonic) and in a partial type. Post concussion seizures can occur early within 24 hour after injury. 75-80% of patients with traumatic brain injury and post concussion seizures had seizures within 2 years after injury and 50% of them had them only once. In addition, the study of Schwab and colleagues (1993), studying patients who had traumatic brain injury 15 years ago, found that 46.9% of patients had post concussion epilepsy.

2.1.3 Loss of bowel and bladder control

Loss of bowel and bladder control can be major psychosocial problems (Valko, 1992: 271). This may occur from pathogenesis in some parts of the brain, which control elimination system. On the other hand, it might happen from unconsciousness or communication deficits, when patients are unable to say about their needs of elimination. The study of Mochizuki and Saito (1990) suggested that if there was an injury to the right superior prefrontal lobe, patients would be temporarily incontinent. If both sides of this lobe had injury, patients would become permanently incontinent.

2.1.4 Complications from prolonged immobilization or static position

The complications mostly found were pneumonia, atelectasis, deep vein thrombosis, postural hypotension, stiffness of joints, and atrophy of muscles. The study of Piek and colleagues (1992) indicated that patients with severe traumatic brain injury had several complications. The abnormalities related to the lungs, cardiovascular system, coagulogram, and electrolyte imbalance were common found within 2-4 days of injury. Infections would happen 5 to 10 days later. The complications, which related to the gastrointestinal tract, liver, and kidneys, had no definite duration. The most common complication was pneumonia (41%). According to the study of Promkhuntong, K. (1997), the complications mostly found in patients with traumatic brain injury were respiratory tract infection (19.6%), pressure ulcers (9.8%), and urinary tract infection, stiff joints, muscle atrophy, and infections in other systems (3.92%).

2.1.5 Post concussion syndrome (PCS)

The symptoms mostly found were headache, dizziness, fatigue, insomnia, sensitivity to light and sound, and blurred vision (Colantonio, et al., 1998: 552; Mahon & Elger, 1989; McLean, et al., 1993: 1043; Naalt, et al., 1999: 208; Schwab, et al., 1993: 98). From the study of Lahz and Bryant (1996), he aching which occurred after injury usually was on the head, neck, shoulder, back, arms, and legs.

Headache was mostly found, 32-47% and 34% in mild and moderate traumatic brain injury, respectively (Lahz & Bryant, 1996: 889; Naalt, et al., 1999: 208). The result of the study of Beetar and colleagues (1996) showed that the patients with traumatic brain injury, who have back pain would also had insomnia more than those without back pain ($p < .01$). From the study of Cohen and colleagues (1992), patients with recent traumatic brain injury (average of 3.5 months) would have insomnia more than those who had traumatic brain injury earlier (average of 29.5 months). Moreover, there was a result of the study that showed that the post concussion syndrome, especially insomnia, would effect emotions, capability in daily living, rehabilitation, and ability to work (Castriotta & Lai, 2001: 1403-1406; Cohen, et al., 1992: S21-S29; Guilleminalt, et al., 2000: 653-659; Webster, et al., 2001: 316-321).

2.2 Cognitive / perception problems

This problem was reflected in the form of deficits in communication, concentration, attention, cognition, memory, vision, taste and scent, and other sensory receptions. The details related to these abnormalities are as follows:

2.2.1 Memory deficits

Memory deficits can usually be found in patients with traumatic brain injury (Macciocchi, et al., 1993: 773-775). They might lose recent memory, caused by pathogenesis in the right hemisphere. Some might lose remote memory, from general pathogenesis in the left and right hemispheres (Flanney, 1992). From the study of Fontaine and colleagues (1999), the patients with severe traumatic brain injury had pathogenesis at the frontal lobe, especially in the prefrontal area, would have memory deficits ($p < .01$). There was a significant statistical correlation with a problem in verbal memory and pathogenesis at the left hemisphere, especially in the left mesial prefrontal region as well as a problem in visual memory and pathogenesis at the left and right mesial prefrontal region. The study of Schwab and colleagues (1993) showed that the patients with penetrating injuries would have verbal memory loss of 56.9% and visual memory loss of 43.6%. The study of Hall and Bornstein (1991) related to the relationship between intelligence and memory in mild traumatic

brain injury patients, found subjects had more impairment in memory than intelligence ($p < .01$).

2.2.2 Attention/concentration problem

Attention/concentration problems result from injury at the brain stem or the connection in the part of prefrontal area (Davis, 2000: 451). According to the study of Fontaine and colleagues (1999), there was a significant statistical correlation with attention problems and pathogenesis in the left mesial prefrontal cortex ($p < .05$) and cingulated gyrus, especially in the middle and anterior cingulated gyri ($p < .01$). As a result, patients have little patience with stimuli, and have bad concentration in performing various activities. They will be interested in every stimulus, were not cooperate in performing activities and are not interested in themselves. For patients with mild traumatic brain injury, this problem may be resolved within 6 months following the injury, but in the patients who had suffered severe traumatic brain injury it may be chronic or permanent in nature.

2.2.3 Communication deficit

The ability to communicate normally requires complex cognitive and motor abilities that involve hearing; attention; processing new information, comparing it with stored information, and responding to it; and physically conveying information. Communication difficulties are usually due to primary motor or language deficit depending on the location of the brain damage.

a. Receptive deficit results from lesions at Wernicke's area, which is the center of language understanding. The patients will not understand speech or written words. He/she hears the speech sound and knows that there is someone talking to him/her but he/she cannot understand. As a result, he/she may invent words or speak but it is not related to the content that others communicate (Tantranon, R., 1996: 513).

b. Expressive deficit results from damage to the motor speech area at the cerebral cortex of the frontal lobe opposite to the dexterous side call Broca's area. As a result, the patients cannot speak fluently or has impaired word-finding ability but they can understand speech or written words. Furthermore, the

patients with a lesion at the brain stem and cerebellum may have speech impairment such as dysphasia, dysarthria, paraphasias, dysprosodies, and dysphonia (Brookshire, 1992).

2.2.4 Perceptual problems

Perceptual problems are commonly found in patients with a lesion at the parietal lobe, which functions in analysis and synthesis of information reception from several sensory receptors in all parts of the body. This problem causes impairment in the perception of pain, touch, temperature, as well as scent deficits caused by pathogenesis in olfactory nerves, post-trauma vision syndrome caused by pathogenesis in the optic nerve, and hearing loss caused by pathogenesis in the vestibular nerve (O'Dell, et al., 1998: S13). These deficits will cause slow response in the patients. The study of Wehman and colleagues (1993) showed that patients with severe traumatic brain injury had visual problem 13.8%, hearing problem 2.5%. In the study of Schwab and colleagues (1993), on patients with traumatic brain injury 15 years ago, 16.9% of the patients had visual deficits and 40.2% had sensory loss.

2.2.5 Intellectual deficits

Intellectual deficits result from problems related to loss of memory, attention, and concentration. As a result, patients also cannot learn about new things, have poor judgment, lack reasoning for decision-making, and are unable to solve problems in daily life. As shown in the study of Hall and Bornstein (1991) patients with close head injuries showed significant intellectual deficits. The study of Schwab and colleagues (1993) found that intellectual deficits were associated with a return to work. Furthermore, intellectual deficits could predict the variation of return to work by 38 % ($p < .01$).

2.3 Emotional / psychological problem

Psychological change is usually found in patients with traumatic brain injury as well as a loss of emotional control (Macciocchi, et al., 1993: 773-774; Rosenthal, et al., 1998: 90). This problem may be due to pathological changes after traumatic brain injury, changes in environment, and changes in body image from the

disability, and dependence on others. These problems produced feelings of being a burden, having dependence, decreasing self-esteem, loss of self-control and inferiority (Jean-Bay, 2000: 169). Patients will show aggressiveness both verbally and behaviorally (Uomoto & Brockway, 1992: 674). The same result was found in the study of Galski and colleagues (1994), where 39% of patients showed aggressiveness both verbally and behaviorally, especially in older male persons with traumatic brain injury.

Furthermore, depression following traumatic brain injury is common, with a point prevalence of 14-29% (Deb, et al., 1998: 899-902; Gomez-Hernandez, et al., 1997: 1321-1326). The study of Rapport and colleagues (2003) indicated that depression following traumatic brain injury was associated with psychosocial dysfunction, psychological distress, postconcussive symptoms, and neurobehavioral dysfunction. Moreover, the study of Prigatamo and Attman (1990) and Rosenthal and colleagues (1998) showed that the patients were frustrated from a lack of ability to take care of themselves, knowing their severity of disability, and worrying about things such as life changes, being left alone, or having less support in future. As mentioned above, there were the major causes of depression in patients, which displayed different symptoms. Some of them might have aggressive behaviors, anger, despair, tiredness, isolation or denial of community integration, or some might have suicidal ideas (Ammon, 1990).

2.4 Behavioral problems

Behavioral problems are a common problem among patients with traumatic brain injury, in particular those with the frontal lobe lesions. The patients lacked attention to themselves and their environments. The patients have behavioral changes due to physical, emotional, and psychological problems that affected them. The changes include emotional swings, aggressive behavior, low self-control, irritability, easy anger and difficulty with anger management, and display of antisocial behaviors (Hanks, et al., 1999: 993; Vanier, et al., 2000: 796). From the study of Hank and colleagues (1999), the patients with moderate traumatic brain injury had these behaviors more than the mild and severe ones with statistical significance ($p < .01$). The study of Johnson and Belleny (1996) reported that aggression and irritability were

more frequent at more than 18 months post injury compared to during the first 18 months. Verbal aggression was five times more common than physical aggression. In the study of Schwab and colleagues (1993), 19.6% of patients had aggressive behaviors and 19.0% of them had hostility.

3. Social problems

The physical, emotional, psychological, and behavioral problems that occur, can cause social problems such as in community integration, rehabilitation, and return to work (Cifu, et al., 1997: 125-131). The study of Abaeu and colleagues (2001) showed that the patients who lost ability to take care of themselves would have emotional problems and difficulty in community integration. The study of Schwab and colleagues (1993) showed that 46% of the patients who could return to work had physical, emotional or social problems and 13.3% would have social isolation.

From the study of Wehman and colleagues (1993) and Novack and colleagues (2001), there were only 5-25% of the patients with severe traumatic brain injury who could return to work normally, 31-35% could work with less efficiency, and 52-60% could not work. Similarity, Ruffolo and colleagues (1999) described the return to work for motor vehicle accident survivors with mild traumatic brain injury. They reported that of the 42% who returned to work, 12% resumed their premorbid level of employment and 30% returned to modified work. Moreover, the study of Wagner and colleagues (2002) showed that the disability level and community integration was associated with return to work ($p < .01$).

Impact of Traumatic Brain Injury on Family and Relatives

The impact of traumatic brain injury is as great for the family as it is for the patient as mentioned above. The reason is, that although the patients had full treatment and rehabilitation, the disabilities or neurological impairments still remained. They cannot take care of themselves and have to depend on others in many aspects, such as daily tasks, treatment plan implementation, rehabilitation, and accident cautiousness. Hence, the family has to carry the burden of taking care of the patient and responding to his/her needs (Acon, 1995; Baker, 1990; Acon & Roberts, 1992). The researcher

reviewed and presented the impacts of traumatic brain injury on family and relatives in the following topics:

1. Physical impact

Taking care of the patients is time and energy consuming; the family caregivers could not have enough sleep and food, and health problems will occur (Watanabe, et al., 2000). For example, the study of Buddhawan, N. (2002) showed that 62.7% of family caregivers had illness or signs and symptoms of diseases during care giving, such as back pain or knee pain caused from lifting or moving the patient's body and stomachache from being unable to eat on time. In addition, the tasks perceived by family caregivers had negative correlation with the caregiver's health status ($r = -.20$, $p < .05$). This result is related to the study of Poungbanhan, K. (1996) who showed daily hours of taking care of patients and severity of disability had a positive correlation with fatigue of caregivers of head injured patients; for example weariness, fatigue, difficulties, and exhaustion, ($r = .70$ and $.80$ respectively, $p < .01$). The severity of disability could explain the variation of fatigue of taking care of these patients by 64.5% ($p < .01$).

2. Psychological and emotional impact

Carrying more burdens, the family caregivers cannot set times to do things efficiently. Facing psychological and emotional changes in the patients, the caregivers have increased the stress and anxiety (Kreuter, et al., 1992; Samartkit, N. & Duangpang, S., 2001). The study of Acon and Roberts (1992) showed that wives of the patients with traumatic brain injury, who took the role of family caregivers would experience stress due to lack of knowledge of how to perform a role and how to adjust themselves to the role. The same result was found in the study of Ergh and colleagues (2002), where 39% of the family caregivers experienced stress from the caregiver's role.

Moreover, the study of Teichner and colleagues (1999) showed that the negative behaviors of the patients with traumatic brain injury affected the psychological happiness of the family members. The study of Watanabe and colleagues (2000) found that the more complicated care the patients needed, the more

stress the family would have. Stress from taking the role of family caregivers affected health status and mentality of the family caregivers. As a result, it lead to a lowered quality of caring (Buddhawan, N., 2002; Synder, et al., 1991).

3. Self and social role impacts

Unlike the others, the burden in taking care of the patient causes the changes in the way of life of the family caregivers, so these had no free time and insufficient time to spend on their careers, and some of them might have to resign from work. Also the time spent with family, friends, and social activities is decreased. The study of Poungbanhan, K. (1996) showed that the family caregivers of the head injured patients experienced fatigue, which caused their work ability to weaken, felt socially isolated, and interaction with others subsided. This was similar to the study of Montogomery and colleagues (2002), in where 16% of family caregivers had decreased meetings or interaction with others and 28% of them had to resign their works. The study of Buddhawan, N. (2002) showed that taking the role of family caregivers caused their roles to their families and communities decrease.

4. Financial impacts

Owing to increasing expense in taking care of the patients, some family members resigned from their work to take care of the patients, which together with the inability of patients to work caused the family income to decreased. For example, the study of Montogomery and colleagues (2002) found that 30% of the families of patients with traumatic brain injury had less income, which could cause debt, which could lead to by psychological and emotional impacts on the family.

Health Status of Patients with Traumatic Brain Injury as Conceptualized through Transition Theory

1. The basic concept in transition theory

The basic concept in transition theory of Schumacher and Meleis (1994) was the middle range theory, which explained that individuals must always change. This theory emphasized assessment and helping patients, families, and community to have a successful transition from one condition to another as well as to get the positive health outcomes. The transition process was an open system; there were inputs, process, and outputs. According to the input or antecedent events, three types of transitions were identified: developmental, situational, and health/illness transition.

A transition has three phases. First, an ending process is the duration found by a person when his/her lifestyle will end. Next, a neutral phase is the adaptation to live normally in order to ongo to the next stage. Last, a new beginning phase is an individual's acceptance and readiness of a new self-identity. A transition process, whether of any type, has the same structure, that is, (1) an entry, followed by (2) a passage to new status, leading to (3) an exit.

Transitions are complex processes. The success of a transition is influenced by transition conditions including: 1.) Meaning refers to the subjective appraisal of an anticipated or experienced transition and the evaluation of its likely effect on one's life; 2.) Expectation is other subjective phenomena that collectively influence the transition experience; 3.) Level of knowledge and skill has a direct effect on a person's capability in managing himself/herself. It is condition that can be considered as the major resource which influences health outcomes; 4.) Level of planning refers to a person's awareness, and intention to solve his/her problems during transition; 5.) Emotional and physical well-being is also important during a transition when physical discomfort or emotional disorder accompanies transition, it may interfere with the assimilation of new information; 6.) The environment can provide resources for a person during transition, such as from families, friends, providers, and institutes.

The health outcomes that came from the transitional process appears in 4 patterns: 1) Restoration, 2.) Maintenance, 3.) Protection, and 4.) Promotion (Chick &

Meleis, 1986: 246). Indicators of successful transitions are 1) Subjective well-being, 2.) Role mastery, 3.) Well-being of relationship.

2. The health/illness transition of patients with traumatic brain injury

Traumatic brain injury is the change in health/illness transition, which affects individuals and families. The patients change from healthy persons to ones with physical, cognitive and perceptual, psychological, emotional, behavioral, or social impairment. They had a transition from staying home to admission in hospital and a transition from admission in the hospital to the recovery phase at home. The family members had a situational transition by starting the role of caregivers. Some patients had a change in social role; from head of the family to the burden of the family and family members had their roles changed from wives or children to family leader.

There are 3 phases in the transitions of the patients with traumatic brain injury. The first is the acute phase, which is the start of the transition. This phase requires intensive therapeutic care from the medical team to help patients pass the crisis and survive. From the study of Assawapat, S. (1996) and Kijmahatrakul, A. (1999), the patients with traumatic brain injury who were operated on in time would have a decreased mortality rate from 85% to 30%. This was congruent with the result from the study of Brooks and colleagues (1997), in which the patients with immediate and appropriate help would have a chance to survive. The second phase is preparation for transition. The survivors usually have impairments or lesions remaining with them as mentioned before, so they needed some times for rehabilitation which depended on the severity of injury including size, and location of pathogenesis. The last phase is the successful transition. Patients can accept and act according to their roles and have a good quality of life, which depends on the transition conditions of each person.

Correlations between Physical Well-being Factor and Environmental Factors on Quality of Life among Patients with Traumatic Brain Injury

As mentioned above the success in the transitional process of the patients with traumatic brain injury depends on the transition conditions of each person. The factors which influenced the health outcomes or the quality of life of the patients includes age, gender, severity of illness, disability level, return to work, emotional status, family financial status and facilitating resources (de-Haan, et al., 1995; King, 1996; Webb, et al., 1995; Wyller, et al., 1998).

Taking there into the variables correlated to the quality of life among patients with traumatic brain injury they can be categorized into two major groups: physical well-being factor and environment factor.

Physical well-being factor

1. Disability level

Disability level is not only affected by the capability of patients doing tasks by themselves and the ability to return to work, but also by the emotional condition of the patients: Incapability of taking care of themselves, feeling like a burden, having low self-esteem, and feeling inferiority (Jean-Bay, 2000: 169). They would feel depressed, isolated, despairing, aggressive, or suicidal in some case (Ammons, 1990). The disability level will decrease over time (Powell, et al., 2001: 1025-1030; Marshall, et al., 1991: S28-S36; Corrigan, et al., 1998: 298-305).

From literature reviews which were related to patients with traumatic brain injury, the Glasgow Outcome Scale (GOS) was the instrument most frequently used by the researchers to assess the disability level in the recovery phase, as seen in the study of Boake and High (1996), Dunn and colleagues (2000), Katz & Alexander (1994), Lehmann and colleagues (1999), Marshall and colleagues (1991), Powell and colleagues (2001), Ross and colleagues (1992), Spettell and colleagues (1991), Whyte and colleagues (2001), etc. Due to the GOS wide range of scores, it is not sensitive enough to the tiny changes of body functions, Wilson and colleagues developed the

Extended Glasgow Outcome Scale (GOSE), which was more accurate and had great coverage up.

In the study of Webb and colleagues (1995), disability level had a negative correlation with the quality of life among patients with traumatic brain injury ($r = -.31$, $p < .01$). In addition, the disability level had an indirect correlation with the quality of life among the patients, and had a negative correlation with return to work of the patients ($r = -.26$, $p < .05$). While, return to work had a positive correlation with the quality of life ($r = .35$, $p < .01$). From the study of Keyser-Marcus and colleagues (2002), disability score could significantly predict return to work at year 5 post concussion brain injury (OR = .75). The study of Schwab and colleagues (1993) indicated that disability level could explain the variation of return to work, which was considered as a dimension of quality of life among patients with traumatic brain injury by 42%.

Environment factors

1. Capability of family caregivers

Capability of family caregivers in taking care of the patients is the complex capability of the family caregivers in doing activities to respond to the needs of the disabled according to deviations in health conditions (Orem, 2001: 284). If the family caregivers had high potential or capability, good outcomes would appear to the patients and themselves. Patients would receive efficient care; the family caregivers would not have stress or pressure and could show their appropriate roles. From the study of Acorn and Roberts (1992), to give accurate care and find the ideas to solve problems, the family caregivers needed preparation of data and to learn in necessary topics before taking this role. This was congruent to the study of Ya-orm, Y. (2001), which found that after receiving family nursing care using a program of family promotion to take part in care of the head injured patients, the scores of capability in giving physical and psychological care to patients increased ($p = .000$) while patients' complications subsided. The study of Potaya, S. (2001) revealed that patients had statistically significant improvement in recovering after receiving the family nursing cares.

2. Family financial status

This is a social factor that influenced the quality of life among patients with traumatic brain injury. It can promote patients to have effective rehabilitation. For example, the study of Webb and colleagues (1995) revealed that family financial status had an indirect correlation with the quality of life among patients with traumatic brain injury. The families with good financial status could afford the patients having rehabilitation, which increased their ability to help themselves. The patients' ability to help themselves at 2 years after traumatic brain injury had a positive correlation with their quality of life ($r = .22$, $p < .05$). In addition, the study of Namasa, A. (2002) showed that family financial status had a positive correlation with health status, which was considered as a dimension of the quality of life among patients with traumatic brain injury ($r = .23$, $p < .01$).

The Quality of Life Assessment of Patients with Traumatic Brain Injury

The quality of life is the popular idea and frequently used, especially in the public health field. According to transition theory quality of life can be used as an indicator of a healthy transition process. Although widely used, this theory was non-specific, complex, changeable and depended on perception of individuals, time, place, society, culture, and illness (Adkins, 1993; Cooley, 1998; Ferrans & Powers, 1992; Gill & Feinstien, 1994; Leininger, 1993; Meeberg, 1993; Zhan, 1992). There is no operational definition or meaning in one recent standard, therefore many researchers are interested in studying quality of life and factors related to it, as well as finding a standard theory or instruments used to measure it. The quality of life assessment can reflect the image of both objective data and subjective data. The objective data can be measured directly by the assessor; for instance educational level, occupation, income, functional status, ability in daily living, related environment, etc. The subjective data is the feelings or perception that people have toward themselves, for instance life satisfaction, well-being, happiness, self-esteem, etc. (Frank-Stromborg, 1984; Meeberg, 1993; Zhan, 1992).

There are three general types of quality of life measures (Mcsweeny & Creer, 1995).

1. General measures are instruments that are designed to be applicable across types of disease, across different medical treatment or health interventions, across demographic and culture subgroups, and to measure quality of life in the most comprehensive or overall manner. For instance, Sickness Impact Profile (SIP), Quality of Well-being Scale (QWB), Medical Outcome Study Short Form 36 (MOS-SF-36), The COOP Chart, The Nottingham Health Profile (NHP), The Quality of Life Index (Spitzer), etc.

2. Disease-specific measurers of quality of life are designed to assess specific diagnostic or patient-groups. The goal in using measures is to assess responsiveness or clinically significant changes in a particular group. They are sensitive and able to detect small changes and they produce data that are often easy to interpret. For instance, McMaster Asthma Quality-of-Life Questionnaire, Asthma Symptoms Checklist, Sydney Asthma Quality-of-Life Questionnaire, Living with Asthma Questionnaire, Childhood Asthma Questionnaire, etc.

3. Measurement battery strategy consists of several specific measures that are scored independently and reported as individual scores. For instance, Self-Monitoring, Psychological Status, Behavioral Status, etc.

The instrument to measure the quality of life is usually an interview, which will obtain quantitative data directly from the patients. In some cases that the patients' lucidity or judgments are impaired, so another instrument, a survey, will be more advantageous to collect data from people who can give only proxy reports, such as the family caregivers and health personnel. Examples of survey are Life Experiences Checklist, The Quality of Life Index (Spitzer), Quality of Well Being Scale, etc. Some instruments are professional rating as the assessor evaluated the quality of life by observing the quality data, for example, QOL Index for Mental Health, QOL Scale, QOL Questionnaire (Shalock), The Quality of Life Index (Spitzer), Quality of Well Being Scale, etc. These instruments are suitable for assessment of the quality of life among patients with traumatic brain injury because most of the patients had neurological impairment.

Conclusion

The literature review presented here demonstrates that traumatic brain injury is a significant public health problem. It causes the great human resource and economic loss. The result of injury or pathogenesis in the brain will have impacts on the patients in many aspects, which cause the psychological problems, for instance anxiety, depression, despair, tiredness, swings in emotion, and behavioral changes such as low emotional control, easy anger, and aggression. These behaviors can cause social problems.

The impact is not only on the patients, but also on family members. They have to carry the burden in taking care of the patient. Some of them might have to change their roles, for example, wives or children change to be the family leader. These changes occur when the patients and their families are in the transitional process. The indicator that shows the success of transition is acceptation and actions according to the new role of the patients. Whether the quality of life will be better depends on the transition conditions of each patient. According to the literature review, a successful transition requires enabling conditions including physical well-being and environmental factors.

Nursing is a professional career directly involved with patients and their families and has a significant role in helping them to have a successful transitional process and get positive health outcomes. Support from nurses is an important environment factor in the transitional process both for the patients and their families. Therefore, nurses should study to throughly understand the patients with traumatic brain injury and what their quality of life is and take their information as a concept to promote their quality of life. The promotion of patients' quality of life is essential because the better quality of life they have, the better families and society will be.

CHAPTER III
METHODOLOGY

This study was a descriptive research in order to examine quality of life among patients with traumatic brain injury and the influence of disability level, capability of family caregiver, and family economic status on the quality of life among patients with traumatic brain injury.

Population and Sampling

The populations for this study were patients with traumatic brain injury who were in the recovery phase and came to the follow-up clinic at the Neurosurgical Clinic, Out-Patient Department, Chachoengsao Hospital, Chonburi Hospital and Rayong Hospital and the family caregivers who accompanied them to the follow-up clinic.

The samples of this study were the patients with traumatic brain injury and family caregivers that met the following inclusion criteria:

1. The patients with traumatic brain injury who had been discharged from the hospital and came to the follow-up clinic at the Neurosurgical Clinic; age equal to or greater than 15 years old; remained disabled had scores on the Extended Glasgow Outcome Scale between 3-7; needed rehabilitations and received caregiving from family caregivers.

2. The family caregivers were who had to be related to the patients in a certain way, as parents, spouses, children, or other relatives; age equal to or greater than 15 years old; were primary family caregivers who had to provide care after the patients were hospital-discharged; had the duration for providing care for at least three weeks because this duration was long enough for direct experience in providing care (Gasemgitvatana, S., 1993: 45).

The size of the sample was determined base on Thorndike's calculation of sample size for regression analysis (Thorndike, cite in Worrapongsatorn, T. 1989: 60)

The sample size $\geq (10 \times n) + 50$ when n = the number of independent variables

$\geq (10 \times 5) + 50$

Therefore, the sample size of this study was equal to or more than 100 samples.

Settings

The settings of this study were Chachoengsao Hospital, Chonburi Hospital and Rayong Hospital. All of these provinces are in Eastern region of Thailand. Chachoengsao Hospital is the secondary hospital; Chonburi Hospital and Rayong Hospital are the tertiary hospital. There are doctors who specialized in neurosurgical area and have Neurosurgical Clinic at the Out-Patient Department. At Chachoengsao Hospital, Neurosurgical Clinic is open on Tuesday and Thursday from 1.00 p.m.- 4.00 p.m. From statistical report, the incidence rate of patients with traumatic brain injury who followed up at this clinic was 1,443 cases in the year of 2001. There were patients with traumatic brain injury of around 1-5 cases a day. At Chonburi Hospital, Neurosurgical Clinic is open on Monday, Tuesday and Friday from 8.00 a.m. - 12.00 a.m. From statistical report, the incidence rate of patients with traumatic brain injury who followed up at this clinic was 3,478 cases in the year of 2001. There were patients with traumatic brain injury of around 1-10 cases a day. At Rayong Hospital, Neurosurgical Clinic is open on Monday and Friday from 1.00 p.m. - 4.00 p.m. From statistical report, the incidence rate of patients with traumatic brain injury who followed up at this clinic was 2,190 cases in the year of 2001. There were patients with traumatic brain injury of around 1-10 cases a day.

The services that provided in three hospitals were similar. Description of services in the Neurosurgical Clinic of these research setting were as follows:

Before receiving treatment from the neurosurgeons, nurses assessed patient's neurological signs, signs & symptoms, and health status. The neurosurgeons examined patients for follow-up treatment and instructed the patients and families about medications. After receiving treatment nurses instructed them about the next

appointment and gave direction to them if they had some questions. There was no formal educational program or formal counseling provided as routine services at these follow-up clinics.

Research Instruments

The instruments used in this study were as follows:

Part I The patients demographic characteristics questionnaire

This questionnaire consisted of the following components: gender, age, religion, marital status, family status, educational level, occupation, income, reimbursement, and previous health problems.

Part II The history of illness questionnaire

This questionnaire consisted of the following components: causes of accident, medication diagnosis, association diagnosis, operation, initial Glasgow Coma Scale, length of stay, period of illness, health problems after injury, communication problems, disability level (assess by the Extended Glasgow Outcome Scale). The details of The Extended Glasgow Outcome Scale (GOSE) were as follows:

The Extended Glasgow Outcome Scale (GOSE) was used to assess severity of illness of patients with traumatic brain injury developed from the Glasgow Outcome Scale (GOS) constructed by Jennett and Bond (Jennett & Bond 1975: 480-484). Previously The GOS had classified the outcomes into five levels. Then Wilson and colleagues developed the GOSE, which classified the outcomes of traumatic brain injury into eight levels. The reliability value derived from the observation kappa value was .85 (Wilson, et al., 1998: 573-85). Thosingha, O. translated the GOSE into Thai version in 2001, two bilingual linguists were also asked to check the accuracy of the language.

In this study used the GOSE for assess the disability level of patients with traumatic brain injury. The eight levels of the GOSE were as follows:

Level 1: There is a very high chance of mortality. The Glasgow Coma Scale results were only 3 or 4 since the very beginning.

Level 2: The patient was in a vegetation state. He or she could not help him/herself and did not have mindful responses.

Level 3: The patient had the highest degree of impairment. He or she needed constant care from others in performing all or almost all daily life activities.

Level 4: The patient had very high degree of impairment. He or she needed care from others in performing a number of daily life activities.

Level 5: The patient had a moderate level of impairment. He or she could take care of him/herself when at home; however, care was required from others when the patient was outside the house.

Level 6: The patient had slight impairment. He or she could take good care of him/herself but required the assistance from others in performing some activities when going out of the house. In addition, the patient could do some work which was lighter than what he or she used to do before the onset of the neurological condition. However, there were certain limitations in terms of social and recreational activities.

Level 7: The patients had a slight chance of recovery. He or she could take care of him/herself to a certain extent. However, the patient still had problems concerning interaction or communication with family members or colleagues. He or she sometime had behavioral and emotional problems but was still able to participate in some social or recreational activities.

Level 8: The patients had a very good chance of recovery. He or she was very likely to live a normal life, being able to take care of him/herself and to go back to work.

The total scores ranged from 1 to 8 points, with high scores reflecting severe remained disabled and low scores reflecting less remained disabled. In this study, the patients in level 1, 2 and 8 were not included because the patients in level 1 and 2 had too severe to be treated at the neurosurgical clinic, outpatient department whereas the patients in level 8 were able to attend the follow-up without having to be accompanied by family caregivers. Therefore, this study was conducted with the patients whose range of GOSE score was at level 3 to 7.

Part III The family caregivers demographic characteristics questionnaire

This questionnaire consisted of the following components: gender, age, religion, marital status, family status, educational level, occupation, relationship with the patient, number of hours spent taking care of the patient each day, period of time spent taking care of the patient after the discharge, number of secondary family caregivers, previous heath problems, heath problems that may have occurred during providing care to the patients family income and family financial status.

Family financial status was a single question to assess the financial status of the patients' family. The family caregivers were asked about their perception toward family status. The scale response as follows: insufficient income, sufficient income without saving money, and sufficient income with saving money, which indicated the extent of financial problems as perceived by the family caregivers.

Part IV This questionnaire consisted of the following components:

1. The Quality of Life Index (Spitzer), is one of the earlier measures in the general quality of life measures, was developed by Spitzer and colleagues in 1981. It was designed as an objective quality of life index and used to identify the overall domain encompassing quality of life: physical, emotional and psychosocial. It had discriminate construct validity, content validity, high internal consistency (Cronbach coefficient alpha = .77) and statistical significant interrater spearman rank correlation (rho = .81, $p < .01$) (Addington-Hall, et al., 1990: 695 - 690; Fox, 1998: 322 – 325; Frank-Stromborg, 1992: 85- 86; Moinpour, et al., 1992, 38-39). It was used with a variety of populations and had translated into Dutch, French, German, Italian and Spanish.

This index was translated into Thai language by Thosingha, O. (2002) and also asked to check the accuracy of language by two bilingual linguists. It contains 5 questions that cover five categories as follows:

1. Activity = ability to work, or study, or perform housework (Question 1)
2. Daily living = ability to meet self-care needs such as eating, dressing and driving (Question 2)

3. Health = overall how the person perceives that he or she is feeling (Question 3)
4. Support = assistance which received from family member or friend (Question 4)
5. Outlook = the psychological effects of the illness (Question 5)

To complete the index the family caregivers rated the patients from 0 to 2 in each of the five categories. By adding the scores in each of the categories an overall quality of life score may be calculated. The range of total scores is 0 to 10 points, with high scores indicated the patients had good quality of life while low scores indicated the patients had poor quality of life.

In addition, there was one question, asking about the level of confident in regard to the patient's condition that family caregiver had assessed. The scoring was as follows:

Most confident	=	1
Very confident	=	2
Confident	=	3
Not so confident	=	4
Doubtful	=	5
Not confident at all	=	6

The accepted scores were score 1, score 2, and score 3 which reflected the confident of family caregivers toward their assessment. In this study, the caregivers reported the score 1 (most confident) and score (very confident).

2. The Denyes & Filday Dependent-Care Agency Instrument was adapted from The Denyes Self-Care Agency Instrument by Filday in 1986 and translated into Thai by Somnarin, O. (1995). The reliability was .82 - .90 (Buddhawan, N., 2002; Somnarin, O., 1995; Tosuksri, W., 1996). It was designed to assess capability in providing care for the dependent. It consisted of 30 items divided into 6 categories as follows:

1. Health knowledge: items 1-6, 11, 13, and 15
2. Attention to health: items 7-9, 21, and 22

3. Ego strength and health decision-making capability: items 10, 12, 23, 24, 27, and 30

4. Physical energy levels: items 16 and 26

5. Feelings: items 14, 17-20, 28, and 29

6. Valuing of health: items 25

All 30 items required the responses in the form of Linear Analog Scale, asking the family caregivers to assess each item and judge how much they had experience, feeling, thought, understanding, skill and motivation as specified in the items, ranging from 0 (none) to 100 (always). Furthermore of these 30 items, 25 were positive items and 5 were negative items (items 15, 16, 18, 26 and, 27). The scoring is as follows:

Positive Items	Negative Items
0 10 20 30 40 50 60 70 80 90 100	100 90 80 70 60 50 40 30 20 10 0

The respondents assessed each item and rated their feeling or knowledge giving each item the score from 0 to 100. The total scores would be then calculated by adding the scores giving to all 30 items; the total scores would range from 0 to 3000, with high scores indicated the family caregivers had high caregiving capability while low scores indicated the family caregivers had low caregiving capability.

Validity and Reliability

Validity

Six experts (Appendix A) were asked to review the three questionnaires: The Extended Glasgow Outcome Scale, The Denyes & Filday Dependent-Care Agency Instrument, and The Quality of Life Index (Spitzer) for content validity, clarity, and language appropriateness. These six experts were:

One neurosurgeon specialized in neurosurgical department.

One nursing instructor specialized in neurosurgical nursing.

Three nursing instructor specialized in surgical nursing.

One nursing instructor specialized in chronic illness nursing.

Reliability

After the questionnaires were revised according to the experts' suggestion, they were tried out on 30 patients with traumatic brain injury and 30 family caregivers who shared similar characteristics as the samples of the study. Cronbach's alpha coefficient was calculated, and the results were as follow:

The Denyes & Filday Dependent-Care Agency Instrument was 0.76

The Quality of Life Index was 0.83

In addition, the reliability of the instruments when used with 111 samples of the this study were as follows:

The Denyes & Filday Dependent-Care Agency Instrument was 0.65

The Quality of Life Index was 0.77

Data Collection

The researcher collected data in the following steps:

1. The researcher submitted the letter of the Dean of the faculty of Graduate Studies, Mahidol University to the director of Chachoengsao Hospital, Chonburi Hospital, and Rayong Hospital to obtain provisional permission.

2. When permission was granted, the researcher explained the objectives of the study and the data collection procedures to the head nurse of Chachoengsao Hospital, Chonburi Hospital, and Rayong Hospital. The researcher set the plan for collecting data as follows:

Hospital	Day	Time
Chachoengsao Hospital	Tuesday and Thursday	1.00 p.m. - 4.00 p.m.
Chonburi Hospita	Monday, Tuesday and Friday	8.00 a.m. - 12.00 a.m.
Rayong Hospital	Monday and Friday	1.00 p.m. - 4.00 p.m.

3. Procedures conducted for data collection in each patient and his/her family caregiver are described as follows:

3.1 The researcher surveyed the name list of patients diagnosed with traumatic brain injury base on the information obtained from Out-Patient Department Card.

3.2 The researcher approached the patients and their family caregivers during their waiting for follow-up treatment. Following manners were consequentively conducted: The researcher introduced herself, explained the purpose, procedure of the study and informed them of human right protection, asked them to sign the information consent form (Appendix B) if they agreed to participate in this study.

3.3 The researcher assessed the patients' disability level by utilizing the Extended Glasgow Outcome Scale in order to select the patients that met the research inclusion criteria.

3.4 The researcher recorded data from Out-Patient Department Card in regard to patients' history of illness and patients' demographic characteristics. Then she interviewed the family caregivers regarding patients' demographic characteristics, family caregivers' demographic characteristics, and family financial status. The Quality of Life Index, and the Denyes & Filday Dependent-Care Agency Instrument were employed within this step.

All of the above procedures required 20 to 30 minutes for completion. The researcher conducted the interview in the area nearly the patients so that care could be provided when there was a patient's need. In addition, the interviews were conducted during the waiting time prior to their appointment to meet with the neurosurgeons. The researcher had arranged the appointment time and the interviewing time so that patients did not miss their schedule or wasted their time because of the interviewing process.

4. After the researcher completed the interview with all 111 samples, the data were analyzed.

Human Subjects Provision

The researcher was well concerned with the ethics of nursing research. Therefore, before conducting this study the research submitted the research proposal to the institutional review board at Chachoengsao Hospital, Chonburi Hospital, and Rayong Hospital to obtain permission. Moreover, the utilization of the data collected from the subjects would be used with consideration of the integrity, value, and possible effects on the subjects. As such, before the data collection process began, the researcher will explain the purpose of the study, the research processes, benefits, length of time for completing the questionnaire, and the right to refuse to participate in the study at any time. The subjects who agree to participate are informed and assured that the data will be kept confidential and will be reported only as group data.

Data Analysis

The data collected were analyzed using the SPSS/PC in the following way:

1. Frequency and percentage were used to describe the demographic data of both the patients and their family caregivers.

2. Range, mean, and standard deviation were used to calculate the overall scores and scores for each dimension of the Quality of Life Index, and the Denyes & Filday Dependent-Care Agency Instrument.

3. Pearson's product moment correlation coefficient (r) was performed among disability level, capability of family caregiver, family economic status, and quality of life among patients with traumatic brain injury.

4. Multiple regression coefficient was analyzed to examine the influencing of disability level, capability of family caregiver, family economic status, and quality of life among patients with traumatic brain injury by setting the statistical significance level at .05. Assumptions must be made in order to use multiple regression analysis. The assumptions included outliers, linearity, normality, homoscedasticity, and multicollinearity (Appendix F).

By using multiple regression analysis the independent variable must be the interval or ratio scale if it is ordinal or nominal scale it must be code to allow proper interpretation. Therefore, family financial status was coded into two vectors. The first vector, label dummy 1, all the families which had sufficient income with saving money received dummy code 1 on that vector, and all others received dummy code 0. On the second vector, dummy 2, all the families, which had sufficient income without saving money, received dummy code 1 on that vector, and all the other families received dummy code 0. The families that had insufficient income which were the reference group in this study had received dummy code 0 on both vectors (table 1).

Table 1 Dummy coding

Groups	**Vectors**	
	Dummy 1	**Dummy 2**
Sufficient income with saving money	1	0
Sufficient income without saving money	0	1
Insufficient income	0	0

CHAPTER IV
RESULTS

This study aimed to examine quality of life among patients with traumatic brain injury and to examine the influence of disability level, capability of caregiver, and family financial status on quality of life among patients with traumatic brain injury. The participants consisted of 111 patients with traumatic brain injury and their family caregivers who accompanied them to a Neurosurgical follow-up Clinic, Out-Patient Department of Chachoengsao Hospital, Chonburi Hospital, and Rayong Hospital. Data collection was performed from January to March 2003. The results were presented in six parts as following sequence:

Part I: Demographic characteristics of the patients with traumatic brain injury

Part II: Demographic characteristics of the family caregivers

Part III: Capability of family caregivers

Part IV: Quality of life among patients with traumatic brain injury

Part V: The relationships between disability level, capability of family caregiver, family financial status, and quality of life among patients with traumatic brain injury

Part VI: Influencing factors on quality of life among patients with traumatic brain injury

Part 1 Demographic Characteristics of the Patients with Traumatic Brain Injury

The findings revealed that 79.3% of the patients with traumatic brain injury were male. The age of them ranged from 15 to 77 years old with the mean age of 34.5 years (S.D. = 15.8). The majority of them (42.4%) were between 22 to 40 years old. Almost all of them (97.3%) were Buddhists. The patients were single and married equally (44.1%). Approximately two-third of the patients (65.8%) were the member of the family. In addition, 51.4% of them had elementary level of education. Moreover, the majority of them (55%) were employees, and 80.0% had no income. More than three-quarters of them (86.5%) had health insurance (table 2).

Table 2 Demographic characteristics of the patients with traumatic brain injury (n=111)

Characteristics	Number	Percent
Gender		
Male	88	79.3
Female	23	20.7
Age (years)		
15 - 21 (Adolescence)	29	26.1
22 - 40 (Adult)	47	42.4
41 - 60 (Middle age)	25	22.5
≥ 61 (Elderly)	10	9.0
(Mean = 34.5, S.D. = 15.8, Min = 15, Max = 77)		
Religion		
Buddhist	108	97.3
Christian	3	2.7
Marital status		
Single	49	44.1
Married	49	44.1
Widowed, Divorced, Separated	13	11.8

Table 2 Demographic characteristics of the patients with traumatic brain injury (n=111) (continued)

Characteristics	Number	Percent
Family status		
Member of the family	73	65.8
Leader of the family	38	34.2
Highest educational level		
No education	4	3.6
Primary school	57	51.4
Secondary school/Certificate	39	35.1
Diploma	3	2.7
Bachelor's degree	8	7.2
Occupational before traumatic brain injury		
Labors	61	55.0
Trader/Business	13	11.7
Student	9	8.1
Unemployed	9	8.1
Agricultures	8	7.2
Housewife	5	4.5
Government officer/State enterprise office	4	3.6
Retired from governmental employed	2	1.8
Average income (baht/month)		
No income	89	80.2
≤ 2,500	4	3.6
2,501-5,000	8	7.2
5,001-7,500	3	2.7
7,501-10,000	3	2.7
≥ 10,001	4	3.6
(Min = 0, Max = 20,000)		
Source of payment		
Universal Coverage Card	42	37.9
Social security insurance	20	18.0
Traffic security insurance	19	17.1
Own payment	15	13.5
Government support	9	8.1
Others: Disabled card, Student card	6	5.4

Additionally, most of the patients with traumatic brain injury (96.4%) had no health problem before the accident. Furthermore, 81.1% sustained traumatic brain injury from motorcycle accident. The majority of them (21.6%) were diagnosed with sudural hematoma, followed by cerebral contusion (17.0%). About one-quarter of them (25.2%) had associated diagnosis such as fracture, blunt trauma, and chest trauma. About a half of them (49.5%) were classified into severe traumatic brain injury. In addition, more than half of them (59.5%) received neurosurgical operation. The range of hospital stay was between 2 to 166 days, the majority of them (41.5%) had length of hospital stay less than two weeks. The time after injury range from 1 to 123 months, more than a half of them (55.9%) had been injured less than three months. Moreover, when measuring disability level by using the GOSE, it was found that the majority of them (30.75%) were in level 6. Finally health problems that most frequently occurred after traumatic brain injury were impaired physical mobility, memory deficits, emotional problems, post concussion syndrome, etc., and about a half of them 50.5% had communication problem (table 3).

Table 3 Characteristics data related to the patients with traumatic brain injury (n=111)

Characteristics	Number	Percent
Previous health problem		
No	107	96.4
Yes: Hypertension	4	3.6
Cause of accident		
Traffic accident:	99	89.2
Motorcycle accident	90	81.1
Car accident	9	8.1
Assault	7	6.3
Fall	5	4.5

Table 3 Characteristics data related to the patients with traumatic brain injury (n=111) (continued)

Characteristics	Number	Percent
Diagnosis		
Subdural hematoma	24	21.6
Subdural hematoma & Fracture base of skull	4	3.6
Subdural hematoma & Epidural hematoma	4	3.6
Subdural hematoma & Intracerebral hematoma	2	1.8
Subdural hematoma & Epidural hematoma & Intracerebral hematoma	1	0.9
Cerebral contusion	17	15.3
Cerebral contusion & Fracture base of skull	7	6.3
Cerebral contusion & Subdural hematoma	4	3.6
Cerebral contusion & Epidural hematoma	4	3.6
Cerebral contusion & Brain swelling	2	1.8
Cerebral contusion & Intracerebral hematoma	2	1.8
Cerebral contusion & Fracture base of skull & Subdural hematoma	2	1.8
Cerebral contusion & Diffuse axonal injury	1	0.9
Epidural hematoma & Intracerebral hematoma		
Epidural hematoma	8	7.2
Epidural hematoma & Fracture base of skull	5	4.5
Epidural hematoma & Intracerebral hematoma	1	0.9
Fracture base of skull	6	5.4
Brain swelling	6	5.4
Brain swelling & Diffuse axonal injury	1	0.9
Intracerebral hematoma	5	4.5
Diffuse axonal injury	4	3.6
Associated diagnosis		
No	77	69.4
Yes:	34	30.6
Fractures	28	25.2
Fracture & Blunt trauma & Chest trauma	2	1.8
Fracture & Chest trauma	1	0.9
Hip dislocation	1	0.9
Fracture & Cranial nerve injury	1	0.9
Cranial nerve injury	1	0.9

Table 3 Characteristics data related to the patients with traumatic brain injury (n=111) (continued)

Characteristics	Number	Percent
Severity of injury (GCS on admission)		
Severe (GCS = 3-8)	55	49.5
Moderate (GCS = 9-12)	31	31.0
Mild (GCS = 13-15)	25	22.5
Neurosurgical operation		
No	45	40.6
Yes:	66	59.5
Craniotomy	32	28.8
Craniectomy	31	27.9
Burr hole	2	1.8
Craniotomy & Craniectomy	1	0.9
Length of hospital stay (weeks)		
≤ 2	46	41.5
3 - 4	28	25.2
5 - 6	17	15.3
7 - 8	9	8.1
≥ 9	11	9.9
(Min = 2, Max = 166)		
Time after the injury (months)		
≤ 3	63	56.8
4 - 6	14	12.6
7 - 9	8	7.2
10 - 12	6	5.4
13 - 24	5	4.5
25 - 60	4	3.6
≥ 61	11	9.9
(Min = 1, Max = 123)		
Disability Level		
GOSE 3	19	17.1
GOSE 4	24	21.6
GOSE 5	24	21.6
GOSE 6	34	30.7
GOSE 7	10	9.0

Table 3 Characteristics data related to the patients with traumatic brain injury (n=111) (continued)

Characteristics	Number	Percent
Problems after traumatic brain injury *		
Physical problems:		
Impaired physical mobility (weakness, paralysis)	45	40.5
Post concussion syndrome:		
Headache	31	27.9
Visual disturbance (blurred vision, diplopia)	20	18.0
Dizziness	10	9.0
Insomnia	7	6.3
Post concussion seizures	13	11.7
Hearing loss	5	4.5
Facial palsy	5	4.5
Stiffness joints	2	1.8
CC Fistula	1	0.9
Cognitive/perceptual problems:		
Memory deficits	44	39.6
Attention problem	10	9.0
Emotional problems	43	38.7
Behavioral problems:		
Being slow	16	14.4
Childish behavior	5	4.5
Verbal aggression	2	1.8
Communication problems		
No	55	49.5
Yes (confuse, anomic, mute)	56	50.5

* Each patient had more than one problem.

Part 2 Demographic Characteristics of the Family Caregivers

The findings revealed that 88.3% of the family caregivers of the patients with traumatic brain injury were female. The age of them ranged from 19 to 77 years old with the mean age of 44.19 years (S.D. = 13.04). The majority group of them (44.2%) was 41 to 60 years old. About three-quarters (77.55%) were married. More than half of them (65.8%) had completed elementary level of education. Nearly half of them (47.7%) were the parents of the patients, while 33.3% were the spouse, 62.1% had secondary caregiver helping them to take care of the patients. About three-quarters (75.7%) had no health problem before becoming caregivers, while about one–quarter (26.1%) experienced physical symptoms or illness during caregiving. The majority of them (28.8%) spent 16 to 20 hours per day for taking care of the patient, with the mean of 10.86 hours (S.D. = 6.22). Duration of being caregivers ranged from 1 to 14 months with the mean duration of 12.40 months (S.D. = 25.96), while 62.2% had been taking care the patients less than three months. In term of income, more than a half of them (64.9%) had income less than 10,000 baht per month, while only 27.0% had sufficient income with saving money (table 4).

Table 4 Demographic characteristics of the family caregivers (n=111)

Characteristics	Number	Percent
Gender		
Female	98	88.3
Male	13	11.7
Age (years)		
15 - 21 (Adolescence)	4	3.6
22 - 40 (Adult)	45	40.5
41 - 60 (Middle age)	49	44.2
≥ 61 (Elderly)	13	11.7
(Mean = 44.19, S.D. = 13.04, Min = 19, Max = 77)		
Marital status		
Single	5	4.5
Married	86	77.5
Widowed, Divorced, Separated	20	18.0

Table 4 Demographic characteristics of the family caregivers (n=111) (continued)

Characteristics	Number	Percent
Highest educational level		
No education	6	5.4
Primary school	73	65.8
Secondary school	24	21.6
Certificate/Diploma	3	2.7
Bachelor's degree	5	4.5
Occupational		
Labors	45	40.5
Housewife	28	25.2
Trader/Business	17	15.3
Agricultures	15	13.5
Retried government employed	3	2.7
Unemployed	2	1.8
Student	1	0.9
Relationship with patients		
Parent	53	47.7
Spouse	37	33.3
Brother/sister	13	11.7
Son/daughter	6	5.4
Others (aunt, daughter in law)	2	1.8
Secondary caregivers		
No	42	37.9
Yes:	69	62.1
Parent	28	25.2
Brother/sister	17	15.3
Others (grandmother, niece)	10	9.0
Son/daughter	8	7.2
Spouse	6	5.4

Table 4 Demographic characteristics of the family caregivers (n=111) (continued)

Characteristics	Number	Percent
Health problem before caregiving		
No	84	75.7
Yes:	27	24.3
Hypertension	6	5.4
Leg pain	4	3.6
Migraine	3	2.7
Diabetes mellitus	2	1.8
Heart disease	2	1.8
Back pain	2	1.8
Asthma	2	1.8
Allergy	2	1.8
Peptic ulcer	1	0.9
Hypertension & Peptic ulcer & migraine	1	0.9
Hypertension & Diabetes mellitus	1	0.9
Hypertension & Heart disease	1	0.9
Health problem during caregiving		
No	82	73.9
Yes:	29	26.1
Anxiety	16	14.4
Back pain	5	4.5
Back pain & anxiety & headache	2	1.8
Headache & anxiety	2	1.8
Headache	1	0.9
Peptic ulcer	1	0.9
Back pain & anxiety	1	0.9
Leg pain	1	0.9
Time spent in caregiving (hour/day)		
≤ 5	27	24.3
6 - 10	28	25.3
11 - 15	20	18.0
16 - 20	32	28.8
≥ 21	4	3.6
(Mean = 10.86, S.D. = 6.22, Min = 4, Max = 24)		

Table 4 Demographic characteristics of the family caregivers (n=111) (continued)

Characteristics	Number	Percent
Period of caregiving (months)		
≤ 3	69	62.2
4 - 6	9	8.1
7 - 9	11	9.9
10 - 12	2	1.8
13 - 24	5	4.5
25 - 60	4	3.6
≥ 61	11	9.9
(Min =1, Max = 121)		
Average family income (baht/month)		
≤ 5,000	23	20.7
5,001-10,000	49	44.2
10,001-15,000	12	10.8
15,001-20,000	13	11.7
20,001-25,000	2	1.8
25,001-30,000	7	6.3
≥ 30,001	5	4.5
(Min = 0, Max =500,000)		
Family financial status		
Insufficient income	33	29.7
Sufficient income without saving money	48	43.3
Sufficient income with saving money	30	27.0

Part 3 Capability of Family Caregivers

The finding revealed that the caregivers of the patients with traumatic brain injury had the total score of capability ranged from 2,430 to 2,990 (the possible range = 0 to 3000) with the mean score of 2,794.86 (S.D. = 113.75). The distribution of score was the left skewness (-.853), which indicated that the caregivers had capability at high level. With respect to each dimension, it was found that the average score of each dimension were relatively high (table 5).

Table 5 Range, mean, and S.D. of capability of the family caregiver classified by each domain and overall scores (n=111)

Capability of caregiver	Possible Range	Actual Range	Mean	S.D.
Total scores	0-3000	2430-2990	2794.86	113.75
Health knowledge	0-900	710-900	873.96	35.35
Attention to health	0-500	300-500	414.23	47.65
Ego strength and health decision-making capability	0-600	480-600	584.68	28.21
Physical energy levels	0-200	50-200	173.06	27.33
Feelings	0-700	470-700	656.67	41.17
Valuing of health	0-100	0-100	92.25	18.22

Part 4 Quality of Life among Patients with Traumatic Brain Injury

The finding revealed that the total score of quality of life among patients with traumatic brain injury ranged from 2 to 9 (the possible range = 0 to 10) with the mean score of 6.23 (S.D. = 1.96), which indicated that the patients had quality of life at moderate level. With respect to each dimension, it was found that support showed the highest score (mean = 1.86, S.D. = .34), followed by health (mean = 1.53, S.D. = .63), while activity yielded the lowest score (mean = .61, S.D. = .53) (table 6).

Table 6 Range, mean, and S.D. of quality of life among patients with traumatic brain injury classified by each domain and overall scores (n=111)

Quality of life	Possible Range	Actual Range	Mean	S.D.
Total scores	0-10	2-9	6.23	1.96
Activity	0-2	0-2	.61	.53
Daily living	0-2	0-2	.85	.59
Health	0-2	0-2	1.53	.63
Support	0-2	1-2	1.86	.34
Outlook	0-2	0-2	1.38	.57

Part 5 The Relationships between Disability Level, Capability of Family Caregiver, Family Financial Status and Quality of Life among Patients with Traumatic Brain Injury

To explore the relationship between disability level, capability of family caregiver, family financial status, and quality of life among patients with traumatic brain injury, the Pearson's Product Moment Correlation was performed. The results revealed that disability level was positively related to quality of life among patients with traumatic brain injury at a high level ($r = .822$, $p < .01$). Capability of family caregiver was positively related to quality of life among patients with traumatic brain injury at a moderate level ($r = .394$, $p < .01$). Finally, family financial status (sufficient income without saving money) was significantly positively related to quality of life among patients with traumatic brain injury at a low level ($r = .212$, $p < .05$). In addition, the results showed the significant relationship among the independent variables such as, disability level was positively related to capability of family caregiver at a low level ($r = .251$, $p < .01$), and family financial status (sufficient income without saving money) was negatively related to family financial status (sufficient income with saving money) at a moderate level ($r = -.531$, $p < .01$) (table 7).

Table 7 Correlations between disability level, capability of family caregiver, family financial status, and quality of life among patients with traumatic brain injury (n=111)

Variables	1	2	3	4	5
1. Disability level	1.000				
2. Sufficient income without saving money	.167	1.000			
3. Sufficient income with saving money	.035	-.531**	1.000		
4. Capability of caregiver	.251**	.057	-.037	1.000	
5. Quality of life among patients with traumatic brain injury	.822**	.212*	.124	.394**	1.000

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

Part 6 Influencing Factors on Quality of Life among Patients with Traumatic Brain Injury

To examine the incorporated influencing of disability level, capability of family caregiver, and family financial status on quality of life among patients with traumatic brain injury. It was discovered that disability level was entered in the first step and accounted for 67.7% of variance ($R^2 = .676$, $F_{(1, 109)} = 227.018$, $p < .01$).

Capability of family caregiver was entered in the second step and accounted for an addition 3.8% of the variance ($R^2 = .713$, $F_{(1, 108)} = 14.238$, $p < .01$).

The family financial status (sufficient income with saving money) was entered in the third step and accounted for an addition 1.1% of the variance ($R^2 = .724$, $F_{(1, 107)} = 4.264$, $p < .05$). Finally, the family financial status (sufficient income without saving money) was entered in the fourth step and accounted for an addition 2.4% of the variance ($R^2 = .748$, $F_{(1, 106)} = 10.088$, $p < .01$) (table 8).

Table 8 Multiple regression coefficient between influencing factors and quality of life among patients with traumatic brain injury (n=111)

Variables	R	R^2	R^2 Change	F Change	b	B
Disability level	.822	.676	.676	227.018	1.285	.822**
Disability level and	.845	.713	.038	14.238	1.206	.772**
Capability of caregiver					3.47E-03	.201**
Disability level and	.851	.724	.011	.264	1.199	.767**
Capability of caregiver and					3.55E-03	.206**
Sufficient income with saving money					.462	.105*
Disability level and	.865	.748	.024	10.088	1.144	.731**
Capability of caregiver and					3.59E-03	.208**
Sufficient income with saving money and					.905	.206**
Sufficient income without saving money					.738	.187**

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

CHAPTER V
DISCUSSION

The purposes of this study were to study quality of life among patients with traumatic brain injury and to study the influence of disability level, capability of family caregiver, and family financial status on quality of life among patients with traumatic brain injury. The discussion of the research findings were presented under these categories:

1. Demographic characteristics of the patients with traumatic brain injury
2. Demographic characteristics of the family caregivers
3. Quality of life among patients with traumatic brain injury
4. Factors influencing on quality of life among patients with traumatic brain injury

Demographic Characteristics of the Patients with Traumatic Brain Injury

Most of patients in this study were male (79.3%). Their ages ranged from 15 to 77 years with an average age of 34.5 years. The largest group of them (42.4%) were adults. Traffic accidents were the most common cause of injury among these patients (89.2%). These findings were congruent with the findings from previous studies, which were examined in the Thai social context (Assawapat, S., 1996; Namasa, A., 2002; Ngaochin, T., 1999; Playpetch, S., 2002; Potaya, S., 2001; Poungbanhan, K., 1996; Samartkit, N. & Duangpaeng, S., 2001; Ya-orm, Y., 2001; Yooplao, R., 2000). This could be explained as adult males use traffic facilities more than other groups and most of them do not have safety behaviors, such as riding motorcycles without wearing helmet, riding in a car without fastening safety belts or consuming alcohol prior to driving. The former explanation is supported by the following studies. Most people put on safety helmets for police checks only (Tangchitvittaya, S., 1999).

According to the study of Petcharoen, N. and colleagues (1998) it was found that riders and passengers of motorcycles had a very low incident rate of safety helmet wearing, only 19.2% of riders and 7% of passengers put on safety helmets. Most of them claimed that it caused uncomfortable feeling. This was similarly to the study of Wirojanasangaroon, S. (1996), which also showed that 87% of the riders and passengers did not wear safety helmets.

This risk behavior resulted in severe traumatic brain injury when an accident occurred as seen in the patients record that 49.5% of them sustained severe brain injury (GCS = 3-8) and most of them were diagnosed of subdural hematoma (41%). From this number, 24% of them had subdural hematoma alone and the rest (17%) had subdural hematoma with other diagnoses for example, epidural hematoma, cerebral contusion, fractured base of skull, etc. (Table 3). It is a fact that subdural hematoma is a consequence of moderate or severe traumatic brain injury (Luckman & Sorensen, 1993) so that more than a half of patients in this study (59.5%) needed operations.

The finding of this study also indicated that 30.6% of patients had injuries of other parts of the body as well. The most frequent injury that occurred was fracture (25.2%). It was consistent with the studies conducted by Phuenpathom, N. and Rattanarert, S. (1988) and Tepahudee, J. and Phuenpathom, N. (1999), which found that 36.41% and 34.01% of the traumatic brain injury patients had injury to other parts of the body, respectively. Although the patients suffered from moderate to severe injury, they had a relatively short hospital stay. The majority of them (41.5%) were hospitalized for less than 2 weeks. This might be due to the accurate emergency management that patients received after the occurrence of accidents. Because of the advance medical technology the survival rate had also been increased as well as the chance to obtain good rehabilitation (Brooks, et al., 1997: S26; Watanabe, et al., 2000: 173). Apart from that, there has been a policy in regard to hospital accreditation, which encourages high quality service with reasonable costs and focuses on health care services at home. Therefore, patients are managed to be discharge early from the hospital as soon as possible to save the treatment expenses of the hospital.

The finding revealed that the patients had health problems such as weakness, paralysis, headache, dizziness, etc. (table 3). This might be because most of the patients (69.4%) had posttraumatic duration of less than 6 months as a result these

health problems remained. It is also congruent with the study conducted by Naalt and colleagues (1999) which revealed that in the first year of traumatic brain injury, patients with moderate and severe traumatic brain injury still had post concussion syndromes: headache, dizziness, drowsiness, fatigue, memory loss, restless, sound tolerance loss, and concentration deficits. This was similar to the study of Uomoto and Brockwa (1993), which found that 89% of mild traumatic brain injury patients had headache, which was an early symptom of posttraumatic syndrome, even though the injury lasted for 6 months.

Demographic Characteristics of the Family Caregivers

Most of the family caregivers (88.3%) were female, the age range of them was between 19-77 years, and the average age was 44.19 years. The largest group of them (42.4%) were in middle age. Most family caregivers were usually patients' mothers or wives. This finding is consistent with previous studies, which found that most of the family caregivers were middle aged woman (Buddhawan, N., 2002; Ergh, et al., 2002; Kolakowsky-Hayner, et al., 2001; Namasa, A., 2002; Ngaochin, T., 1999; Playpetch, S., 2002; Potaya, S., 2001; Poungbanhan, K., 1996; Samartkit, N. & Duangpaeng, S., 2001; Watanbe, et al., 2000; Ya-orm, Y., 2001; Yooplao, R., 2000). The previous studies also showed that the role of the family caregivers among the patients with traumatic brain injury usually belonged to females. It might be because of social beliefs and cultural values, which expected females to take care of family members, especially during illness, while males will be responsible for all expenses (Suwanno, C., 1997: 820, Gasemgitvatana, S., 1993: 86).

It also found that about three-quarters of the family caregivers (75.7%) did not have any health problems before taking the family caregiver role. However, about one-quarter of them (26.1%) developed health problems after taking this role such as anxiety, headache, back pain, etc. (Table 4). However, in this study it was found that the family caregivers had less health problems that occurred after they became caregivers than the previous studies (Buddhawan, N., 2002; Navarat, W., 2002; Sangboon, K., 2002; Songwattanayut, W., 2002) which demonstrated that 62.7-77.0% of family caregivers experienced health problems during caregiving. This might be

due to the assistance they received from the secondary caregivers as accounted for by 62.1%. Evidences from the findings also supported that when a patient's parent was a primary caregiver, a patient's sister or brother or spouse would serve as a secondary caregiver, and while a patient's spouse was a primary caregiver, a patient's daughter or son would serve as a secondary caregiver. Having assistance from others, the burden regarding caregiving might be released. In addition, most of them (62.2%) took care of patients for less than 3 months; thus, the health problems might have not been developed yet.

Most patients' families (64.9%) had enough income without saving any money and only 27% of the family caregivers reported that their family had enough income with savings. Most of them revealed that patients' health problems did not elevate the family expenses because almost all patients (86.5%) received other sources of financial support for their medical expenses. Only 13.5% of them reported paying the medical expense out of their pockets. However, when considering the overall family financial status, patients' illness affected the family because there were other expenses for providing care with the patients, for instance cost of rehabilitations, cost of transportation to the follow-up clinic. Family caregivers also lost their regular income on the follow-up day due to their absence from work.

It was noticeable that the average family income showed a relatively wide range from 0 (4 families) to 500,000 (1 family) baht per month. When employing stepwise multiple regression by trimming these 5 outlier patients, the beta values were decreased. It can be considered that outliers had influenced the beta values. When considering collinearity statistics it was found that the tolerance values went from a low of .683 to a high of .935 (table 9). Tolerances of .683 for sufficient income without saving money means that 31.7% (1 - .683 = .317) of this variable was shared with other predictors. This figure illustrated that there was mild violation to the assumption of multiple regression analysis. However, these outlier patients still remained in the study in order to present the fact that there is a wide gap of financial status in Thai society; there are both very poor who had no income while there are the very wealthy who had a very large amount of income.

Quality of Life among Patients with Traumatic Brain Injury

This study aimed to evaluate patients' quality of life utilizing assessment tools that covered physical, mental, emotional, and social dimensions. The results showed the relatively moderate scores of quality of life (Mean = 6.23, S.D. = 1.96). With respect to each dimension, it was found as follows:

Quality of life on the activity dimension and the daily living dimension had relatively low scores (Mean = .61, S.D. = .53; Mean = .85, S.D. = .59, respectively), which reflected the family caregivers' thoughts that patients were unable to take care of themselves, to perform social activities, and to return to work. This could be explained because patients with traumatic brain injury usually sustained several disabilities and required long-term rehabilitation and support. (Grzankowski, 1997; Lovasil, et al., 2001: 24-25). As seen in this study, 49.5% of patients sustained severe brain injury, almost all of them (91%) had a score on the GOSE of between 3-6, and about a half of them 50.5% had communication problems, 40.5% had impaired physical mobility, 48.6% had cognitive/perceptual problems, 20.7% had behavioral problems (table 3). As a result the patients were unable to perform self-care activities independently and were unable to return to work or conduct a normal social life. Patients' disabilities still remained so care and rehabilitation from the family caregivers were needed.

Quality of life on the outlook dimension had a relatively moderate score (Mean = 1.38, S.D. = .57), which showed the family caregivers evaluation that patients cannot control their emotions, and sometime they might feel anxious or depressed. This result may be due to the fact that pathological changes occurred after traumatic brain injury. Moreover, traumatic brain injury can cause many defects, resulting in forced-dependence, which induces low self-esteem (Jean-Bay, 2000: 169). They might behave with aggression, anger, withdrawal, despair, and exhaustion (Ammons, 1990). Patients will show aggressiveness both in verbally and behaviorally (Uomoto & Brockway, 1992: 674). In the study of Galski and colleagues (1994), 39% of patients showed aggressiveness both in verbally and behaviorally, especially older male persons with traumatic brain injury. As seen in this study, 38.7% of patients had problems of emotional control and 1.8% had verbal aggressiveness.

Quality of life on the health dimension had relatively high scores (Mean = 1.53, S.D. = .63). This result may be because most of them were in the recovery phase at home and the clinical manifestations were stable, therefore, the family caregivers evaluated that they had good health condition. The study of Ya-Orm, Y. (2001) also found that the health condition was better over time.

Quality of life on the social support dimension had the highest score (Mean = 1.86, S.D. = .34), which showed the evaluation of the family caregivers that patients were received the best support from their families. This may be due to the fact that Thai families are full of love and care, especially in the rural way of life, therefore, if a family member was sick, the others will take the role of relative caregivers willingly to promote appropriate and constant care. The family caregivers will perform their best to make patients fully recover and able to return to social life.

Factors Influencing Quality of life among Patients with Traumatic Brain Injury

Disability level

The study showed that GOSE scores had a high positive correlation with patients' quality of life ($r = .822$, $p < .01$) (table 6). This could explain 67.6% of the variance of quality of life ($p < .01$) (table 8). This finding supported the hypothesis of the research.

That was, patients with high GOSE scores, which referred to a low disability level, had high quality of life. On the other hand, patients with low GOSE scores, which referred to high disability level, had low quality of life. The explanation is that disability caused patients to be forced-dependent, unable to conduct normal daily life such as basic daily activities, community integration, rehabilitation, and return to work. As seen in the finding of this study, almost all patients (91%) had a score on the GOSE of between 3-6 (table 3) and quality of life scores on the activity dimension and the daily living dimension, were relatively low (table 6). Moreover, disabilities also had an impact on emotional and psychological dimensions, which could be because patients with severe disabilities could not take care of themselves and required partial

or total assistance from others. Being in a dependent situation, patients might have low self-esteem, resulting in a reduced quality of life.

This result was also consistent with the study conducted by Kreuter and colleagues (1998) who found that severity of disability had a positive correlation with quality of life among patients with traumatic brain injury ($r = .48$, $p < .01$). The study of Webb and colleagues (1995) also found that disability level had a negative correlation with traumatic brain injury patients' quality of life ($r = -.31$, $p < .01$). Moreover, it also had a negative correlation with return to work ($r = -.26$, $p < .05$), which is a dimension of patients' quality of life. In addition, the study of Samartkit, N. and Duangpaeng, S. (2001) also indicated that disability level had impacts on patients' daily living, career, mental, and emotional health, social functions, and family relationships. The former variables were the reflection of quality of life.

The disability level is an important transition condition, especially in the transitional period from illness to a healthy condition (Schumacher & Meleis, 1994) because disabilities had direct impacts on physical functions, such as daily activities, traveling, and returning to work. The higher the level of disability, the more difficulties the patients have during transitional period, resulting in a negative quality of life. The study of Samranbua, A. (2001) also found that functional heart class, which reflected cardiac patients' physical function, had a positive correlation with the holistic health of post cardiac valvular replacement patients ($r = .399$, $p < .01$). Similarly, the study of Kromvongkon, S. (2002) also revealed that severity of disability, which is a physical well-being condition, had a negative correlation with the holistic health of amputee adolescents ($r = -.232$, $p < .05$).

It was notice that disability level had a high correlation with quality of life. This can be explain because the GOSE that was used to reflect patient's disability level in this study is a clinical disability measurement, which shows the ability of independence in all dimensions such as activities of daily living, work and social integration. While, the Quality of Life Index used to identify the overall patients' quality of life included physical, emotional and psychosocial dimensions. With respect to the physical dimension it consisted of ability to work, or study, perform housework, and ability to meet self-care needs such as eating, dressing and driving. The sample in this study might emphasize the physical dimension rather than other dimensions. This

is similar to previous studies that showed that clinical health or physical health was the dimension that received the most attention (Danaidusadeekul, S., 1999; Kromvongkon, S., 2002; Samranbua, A., 2001). For that reason, the correlation between these 2 variables was relatively high.

Capability of family caregivers

The study found that capability of family caregivers had a positive correlation with patients' quality of life ($r = .394$, $p < .01$). It could increasingly explain 3.8% of the variance of quality of life among patients with traumatic brain injury ($p < .01$) (table 7). This finding supported the hypothesis of the research.

This result indicated that the patients whose the family caregivers had high capability in providing care will receive extensive care and strong support in any way. Patients would then recover sooner with less complications (Baker, 1993: 30-33; Pasquarello, 1994: 76-82), resulting in good quality of life. Findings from the study are also consistent with the study conducted by Potaya, S. (2001) and Ya-orm, Y. (2001), which revealed that traumatic brain injury patients who received good physical and mental care from the caregivers had a good recovery condition and high ability to take care of themselves.

It can be considered that the capability of family caregiver is an important transition condition that helps patients transit to a healthy condition and resume their previous life easily. Patients with traumatic brain injury usually had physical, emotional, behavioral, and personality changes, as a result they were unable to conduct regular social life. They must depend on the family caregivers in many ways as seen in this study; activities of the family caregivers were accident monitoring (100%), diet and medication (94.6%), exercise promotion and physical rehabilitation control (91.9%), care of personal hygiene (52.3%), cognitive rehabilitation (43.2%), traveling (30.6%), elimination (22.5%), and resting (14.4%).

Family financial status

The study revealed that family financial status (sufficient income without saving money) had a positive correlation with quality of life among patients with traumatic brain injury ($r = .212$, $p < .05$). Sufficient income with saving money could

explain increasingly 1.1% of the variance of quality of life among patients with traumatic brain injury ($p < .01$) and sufficient income without saving money could increasingly explain 2.4% of the variance of quality of life among patients with traumatic brain injury ($p < .01$) (table 8).

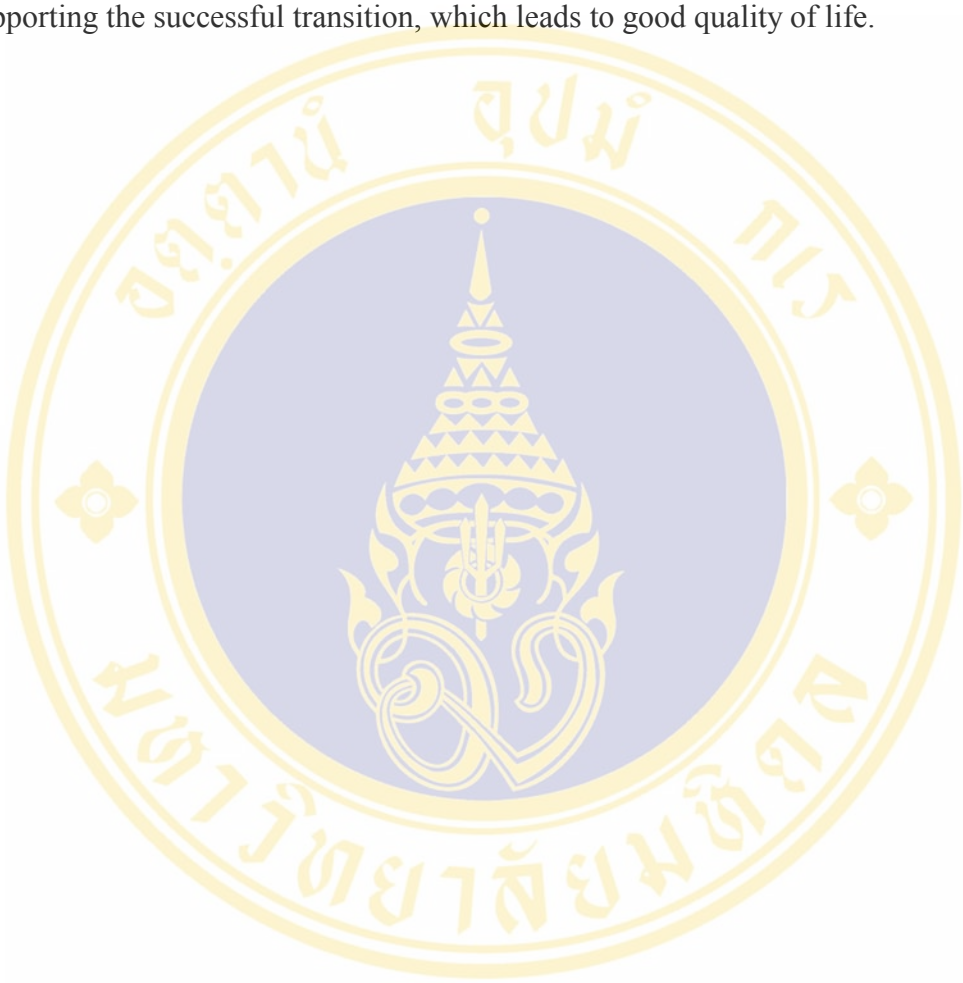
This result indicated that the patients whose family had good financial status will achieve a good quality of life and the ones whose family had to face up to financial problems are more likely to have poor quality of life. It could be explained that family financial status is an indicator of family support, due to it being a basic factor of personal and family life. The rich families can provide their patients with proper care and get access to better health care than the poor families, resulting in good quality of life for the former.

This result was consistent with the study of Namasa, A. (2002), which found that family financial status had a positive correlation with health status, which is a dimension of quality of life ($r = .23$, $p < .01$). Moreover, the study of Webb and colleagues (1995) revealed that family financial status had an indirect correlation with the quality of life among patients with traumatic brain injury; the families with good financial status could afford the patients having rehabilitation, which increased their ability to help themselves.

Finally, the findings of this study revealed that disability level, capability of family caregiver, and family financial status accounted for 74.8% of the variance in overall quality of life among patients with traumatic brain injury ($p < .01$). Therefore, the research hypothesis was totally supported. As such, it could be said that the patients who have less disability level, have family caregivers that have high capability, and are member of a family that have good financial status, would eventually have better quality of life.

In conclusion, findings from this study supported the propositions as proposed in Transition theory, which stated that an individual must always change and the successes of transition are influenced by transition conditions of each individual. Being a traumatic brain injury patient can be conceptualized as being in a health-illness transition. Throughout the transitional process there are factors that help facilitate a healthy transition among traumatic brain injury patients. These factors are disability level, which was characterized as a physical well-being factor, and

capability of family caregiver and family financial status, which were characterized as environmental factors. In addition, nurses are important persons in the health care team who are also environmental factors or useful resource in the transitional process of the patients. The nurses have direct responsibility in helping promotion, and supporting the successful transition, which leads to good quality of life.



CHAPTER VI
CONCLUSION

This chapter presented in four parts. First, the summary of the study will be described. Then, implications of research finding on nursing practice, follow by implications of research finding on further research will be suggested. Finally, limitation will be presented.

The Summary of the Study

This study was a descriptive research aimed to examine quality of life among patients with traumatic brain injury and the influence of disability level, capability of family caregiver, and family financial status on patients' quality of life. The participants of this study were composed of 111 patients with traumatic brain injury who were in the recovery phase and came to the follow-up clinic at the Neurosurgical Clinic, Out-Patient Department, Chachoengsao Hospital, Chonburi Hospital and Rayong Hospital and the family caregivers who accompanied them to the follow-up clinic. Data collection was performed from January to March 2003.

The instruments in this study comprised general information questionnaire of demographic data of patients and family caregivers, history of illness questionnaire, the Extended Glasgow Outcome Scale, the Denyes & Filday Dependent-Care Agency Instrument, and the Quality of Life Index (Spitzer). Descriptive statistics, Pearson's product moment correlation, and stepwise multiple regression were employed to analyze the data.

The findings revealed that the largest group of the patients in this study were male (79.3%) with an average age of 34.5 years (S.D. = 15.8) and the ratio of male and female were 4:1. Almost all of them (97.3%) were Buddhists, 44.1% were single, while an equal number were married. The majority group of them (80.0%) had no income. Traffic accidents were the common cause of injury among these patients

(89.2%). Forty one percent of them were diagnosed with subdural hematoma, 30.6% had injuries of other parts of the body, 41.5% were hospitalized for less than 2 weeks, 56.8% had post concussion period duration of less than 3 months, 30.75% had a score on the GOSE of 6, and about half of them (50.5%) had communication problems.

The family caregivers of the patients with traumatic brain injury were female (88.3%). The age of them ranged from 19 to 77 years old with an average age of 44.19 years. About half of them (47.7%) were the parents of the patients and 33.3% were patients' spouse. More than half of them (62.1%) had secondary caregivers to help them take care of the patients. About one-quarter of them (26.1%) experienced physical symptoms or illness during caregiving. The majority of them (64.9%) had an average family income of less than 10,000 baht per month and only 27.0% had sufficient income with saving money.

Pearson's product moment correlation indicated that disability level, capability of family caregiver and sufficient family financial status were positively related to patients' quality of life ($r = .822$, $p < .01$; $r = .394$, $p < .01$; $r = .212$, $p < .05$; respectively).

Stepwise multiple regression analysis showed that disability level, capability of family caregiver, and sufficient family financial status could explain the variation in the quality of life among patients with traumatic brain injury by 74.8% ($p < .01$).

Implications of Research Finding on Nursing Practice

1. The findings of this study are evidence that disability level is a significant influential factor of quality of life. Health care providers who work with traumatic brain injury patients have an important role in promoting patients' quality of life. Therefore, the patients should be provided with effective constant care managed by a multidisciplinary team during hospitalization in order to diminish disabilities and complications that might occur. Early rehabilitation program should be offered to every patient so that they could have good recovery and attain a high quality of life.

2. The result of this study revealed that the capability of family caregiver was a significant influential factor of quality of life Therefore, the comprehensive discharge planning program should be developed to promote capability of the family

to be congruent with each patient's needs. Moreover, capability of family caregiver should be also continuingly evaluated, during hospitalization and at the follow-up period. When low capability is identified, nursing intervention to enhance caregivers' capability should be conducted. Moreover, nurses should be a resource of information in guiding family caregivers to deal with the patients' changes such as cognitive, behavioral and personality changes. In addition, family caregivers should be concern and open the opportunity to ventilate their feelings in order to find out the causes of emotional distress, therefore, a counseling service and a supportive group for family caregivers should be established at the follow-up clinic.

3. There was evidence from this study to support the theory that family financial status was an influential factor of quality of life. In order to promote quality of life among the patients, nurses should assess family financial status during hospitalization and at the follow-up period; if a financial problem is identified, nurses should be facilitate them in gaining access to all available resources that are necessary for them especially, financial support.

4. Nurses should be aware of any factors that could have an affect on quality of life and pay attention to measuring quality of life among patients with traumatic brain injury in every stage of illness, because the information can be used in planning to help patients undergo the transitional period easily, which can lead to them returning to a regular life, as well as to help patients have good quality of life. Moreover, quality of life is an outcome or indicator of health care service quality.

5. The findings of this study revealed that family caregivers experienced both physical and emotional problems especially, back pain and anxiety. Therefore, nurses should plan to prevent these problems by facilitating knowledge and skill training in regard to transportation tasks, provide stress management techniques.

6. Nurses whom providing care for traumatic brain injury patients should prepare knowledge and skills in all aspects regarding essential care for these patients. Moreover, they should be periodically trained.

Implications of Research Finding on Further Research

1. Most of the patients in this study had a period of illness less than one year. Therefore, comparative research about quality of life with different periods of illness should be conducted. The follow-up of quality of life from hospitalization to returning to their regular social life should be conducted as well.

2. In non-cognitive and non-communication problems patients, a comparison of quality of life between objective and subjective information, self report and proxy report, or professional rating and other transition conditions, such as meaning, expectation, planning, level of knowledge and skills, and emotional well-being, should be conducted.

3. Quasi-experimental research to evaluate the effectiveness of nursing intervention to promote patients' quality of life, for example intervention to enhance capability of family caregivers and promotion of patients' independence should be conducted.

Limitation

The majority of patients in this study had a period of illness of less than one year, and was most frequency less than three months. Therefore, the results of this study may not be generalized to patients who had a long-term period of illness.

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APPENDIX A

List of Experts

List of Experts

The content of the Extended Glasgow Outcome Scale, the Quality of Life Index, and the Denyes & Filday Dependent-Care Agency Instrument were validated by six experts as follows:

1. Dr.Wanpen Pichitpornchai, Ph.D.
   Department of Medical Nursing
   Faculty of Nursing, Mahidol Univerity
2. Asst.Prof.Arun Nurake, M.Ed. (Nsg. Adm.)
   Department of Surgical Nursing
   Faculty of Nursing, Mahidol Univerity
3. Asst.Prof.Piyavat Kesmas, M.Sc. (Nsg.)
   Department of Surgical Nursing
   Faculty of Nursing, Mahidol Univerity
4. Asst.Prof.Woranuch Kiettiphongthavorn, M.Sc. (Nsg.)
   Department of Surgical Nursing
   Faculty of Nursing, Mahidol Univerity
5. Sqn.Ldr.Dr.Soparn Potaya, D.N.S.
   Neurosurgical Intensive Care Unit, Bhumibol Adulyadej Hospital,
   Medical Directorate, Royal Thai Air Force, Bangkok, Thailand
6. Asst.Prof.Voravut Chanyavanich, M.D., FRCST. (Neurol Surgery)
   Division of Neurosurgery, Department of Surgery
   Faculty of Medicine, Siriraj Hospital

An expert who backtranslation the Quality of Life Index (Spitzer) and bilanguage specialist

1. Asst.Prof.Dr.Punchalee Wasanasomsithi
   Language institute, Chulalongkorn University

APPENDIX B

Information Consent Form

Information Consent Form

แบบฟอร์มการยินยอมและการพิทักษ์สิทธิของผู้ร่วมวิจัย

ดิฉันนางสาวฉวีวรรณ วรรณทนะ เป็นนักศึกษาหลักสูตรปริญญาโท สาขาวิชาการพยาบาลผู้ใหญ่ คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล มีความสนใจที่จะทำการวิจัยเรื่อง “ปัจจัยที่มีอิทธิพลต่อคุณภาพชีวิตของผู้ป่วยบาดเจ็บที่สมอง” ท่านเป็นผู้หนึ่งที่ดิฉันคิดว่าจะสามารถให้ข้อมูลที่เป็นประโยชน์สำหรับการวิจัยในครั้งนี้ และถ้าท่านมีความสมัครใจที่จะเข้าร่วมในการวิจัยครั้งนี้ ดิฉันขอให้ท่านตอบแบบสอบถาม 1 ชุด ซึ่งประกอบด้วย แบบบันทึกข้อมูลส่วนบุคคลของผู้ป่วย แบบบันทึกข้อมูลส่วนบุคคลของญาติผู้ดูแล/แบบสอบถามฐานะทางเศรษฐกิจของครอบครัว ดัชนีคุณภาพชีวิตของผู้ป่วย และแบบสอบถามความสามารถของญาติผู้ดูแล ซึ่งจะใช้เวลาในการตอบแบบสอบถามนี้ประมาณ 20-30 นาที

ท่านมีสิทธิที่จะปฏิเสธหรือยกเลิกการตอบแบบสอบถามได้ตลอดเวลา โดยไม่มีผลกระทบต่อการดูแลหรือการรักษาที่ท่านได้รับแต่อย่างใด ผลการศึกษาครั้งนี้จะเป็นข้อมูลพื้นฐานในการพัฒนาคุณภาพทางการพยาบาลเพื่อให้สอดคล้องกับปัญหา และความต้องการของผู้ป่วยบาดเจ็บที่สมอง

ข้อมูลที่ได้รับจากท่าน ดิฉันจะเก็บเป็นความลับและนำมาใช้ในการศึกษาครั้งนี้เท่านั้น หากท่านมีข้อสงสัยใดๆ ในระหว่างตอบแบบสอบถาม ท่านสามารถที่จะถามดิฉันได้ ถ้าท่านยินดีที่จะเข้าร่วมการวิจัยกรุณาลงชื่อในแบบฟอร์มนี้ ดิฉันขอขอบพระคุณในความร่วมมือในครั้งนี้

นางสาวฉวีวรรณ วรรณทนะ
ผู้ดำเนินการวิจัย

……

สำหรับผู้เข้าร่วมงานวิจัย

ดิฉัน/กระผม……ได้รับการอธิบายข้อมูลเกี่ยวกับการวิจัยครั้งนี้เรียบร้อยแล้ว ดิฉัน/กระผมมีความยินดีที่จะให้ความร่วมมือในการวิจัยในครั้งนี้

ลงชื่อ……..

APPENDIX C

Permission Letters for Data Collecting

Permission Letters for Data Collecting

ที่.....221.....
วันที่.....17 ม.ค. 2546.....
เวลา.....11.46.....

โรงพยาบาลเมืองฉะเชิงเทรา
รับที่ 000501
วันที่ 17 ม.ค. 2546
เวลา 11.30 น.

บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล
คณะแพทยศาสตร์ศิริราชพยาบาล
ตึกจุลชีววิทยา ชั้น 4 2 ถนนพรานนก
เขตบางกอกน้อย กรุงเทพฯ 10700
โทร.0-2419-7060 โทรสาร 0-2411-2002

ที่ ทม 0802.01(ศร)/0039

ฝ่ายการพยาบาล
รับที่ 058
วันที่ 22 ม.ค. 2546
เวลา 11.10น.

7 มกราคม 2546

เรื่อง ขอความอนุเคราะห์ให้นักศึกษาได้มาเก็บข้อมูล เพื่อประกอบการทำวิทยานิพนธ์

เรียน ผู้อำนวยการโรงพยาบาลเมืองฉะเชิงเทรา

สิ่งที่ส่งมาด้วย แบบสัมภาษณ์ จำนวน 1 ชุด

ด้วย นางสาวฉวีวรรณ วรรณทนะ นักศึกษาบัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล หลักสูตรปริญญาโท สาขาวิชาการพยาบาลผู้ใหญ่ คณะพยาบาลศาสตร์ ปัจจุบัน กำลังเขียนโครงร่างวิทยานิพนธ์ เรื่อง "ปัจจัยที่มีอิทธิพลต่อคุณภาพชีวิตของผู้ป่วยบาดเจ็บที่สมอง" อยู่ในความควบคุมของ ผศ.ดร.อรพรรณ โตสิงห์ ซึ่งในการศึกษาวิจัยครั้งนี้นักศึกษามีความประสงค์จะเก็บข้อมูลจากผู้ป่วยบาดเจ็บที่สมองที่มารับการตรวจรักษาที่แผนกผู้ป่วยนอกและญาติผู้ดูแลที่พาผู้ป่วยมารับการตรวจรักษา ณ โรงพยาบาลเมืองฉะเชิงเทรา โดยใช้วิธีการสัมภาษณ์ด้วยตนเอง ตั้งแต่เดือน มกราคม 2546 ถึงเดือน มีนาคม 2546

บัณฑิตวิทยาลัย จึงใคร่ขอความกรุณาจากท่านโปรดอนุเคราะห์ให้นักศึกษาได้เก็บข้อมูล เพื่อประกอบการทำวิทยานิพนธ์ ตามที่เห็นสมควรด้วย จักเป็นพระคุณยิ่ง

ขอแสดงความนับถือ

(ศาสตราจารย์ นพ.บรรจง มไหสวริยะ)
รองคณบดีฝ่ายวิจัย ปฏิบัติราชการแทน
คณบดีบัณฑิตวิทยาลัย

21 ม.ค. 2546

ผู้อำนวยการโรงพยาบาลเมืองฉะเชิงเทรา

ติดต่ออาจารย์ผู้รับผิดชอบวิชา ผศ.ดร.อรพรรณ โตสิงห์
โทร 0-1753-7434

ที่ ชบ 0033.1/

โรงพยาบาลชลบุรี
69 หมู่ 2 ถนนสุขุมวิท
ตำบลบ้านสวน อำเภอเมือง
จังหวัดชลบุรี 20000

กุมภาพันธ์ 2546

เรื่อง ขอความอนุเคราะห์ให้นักศึกษาเก็บข้อมูล เพื่อประกอบการทำวิทยานิพนธ์

เรียน คณบดี บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล

อ้างถึง หนังสือบัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล ที่ ทม 0802.01(ศร)/0038 ลงวันที่ 7 มกราคม 2546

ตามหนังสือที่อ้างถึง บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล ได้ขอความอนุเคราะห์ให้นางสาวฉวีวรรณ วรรณทนะ นักศึกษาบัณฑิตวิทยาลัย หลักสูตรปริญญาโท สาขาวิชาการพยาบาลผู้ใหญ่ เก็บรวบรวมข้อมูลการวิจัยเรื่อง"ปัจจัยที่มีอิทธิพลต่อคุณภาพชีวิตของผู้บาดเจ็บที่สมอง" นั้น

โรงพยาบาลชลบุรีพิจารณาแล้วไม่ขัดข้อง ยินดีให้นักศึกษาดังกล่าวดำเนินการเก็บข้อมูลได้

จึงเรียนมาเพื่อโปรดทราบ

ขอแสดงความนับถือ

(นางบุตรเรียง กิตติคุณ)
นายแพทย์ 9
[illegible]

กลุ่มพัฒนาระบบบริการสุขภาพ
โทร.0-3827-4200-7 ต่อ 539
โทรสาร 0-3827-7207 หรือ 0-3827-4911

บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล
คณะแพทยศาสตร์ศิริราชพยาบาล
ตึกจุลชีววิทยา ชั้น 4 2 ถนนพรานนก
เขตบางกอกน้อย กรุงเทพฯ 10700
โทร.0-2419-7060 โทรสาร 0-2411-2002

ที่ ทม 0802.01(ศร)/ 0037

7 มกราคม 2546

เรื่อง ขอความอนุเคราะห์ให้นักศึกษาได้มาเก็บข้อมูล เพื่อประกอบการทำวิทยานิพนธ์

เรียน ผู้อำนวยการโรงพยาบาลระยอง

สิ่งที่ส่งมาด้วย แบบสัมภาษณ์ จำนวน 1 ชุด

ด้วย นางสาวฉวีวรรณ วรรณทนะ นักศึกษาบัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล หลักสูตรปริญญาโท สาขาวิชาการพยาบาลผู้ใหญ่ คณะพยาบาลศาสตร์ กำลังเขียนโครงร่างวิทยานิพนธ์ เรื่อง "ปัจจัยที่มีอิทธิพลต่อคุณภาพชีวิตของผู้ป่วยบาดเจ็บที่สมอง" อยู่ในความควบคุมของ ผศ.ดร.อรพรรณ โตสิงห์ ซึ่งในการศึกษาวิจัยครั้งนี้นักศึกษามีความประสงค์จะเก็บข้อมูลจากผู้ป่วยบาดเจ็บที่สมองที่มารับการตรวจรักษาที่แผนกผู้ป่วยนอกและญาติผู้ดูแลที่พาผู้ป่วยมารับการตรวจรักษา ณ โรงพยาบาลระยอง โดยใช้วิธีการสัมภาษณ์ด้วยตนเอง ตั้งแต่เดือน มกราคม 2546 ถึงเดือน มีนาคม 2546

บัณฑิตวิทยาลัย จึงใคร่ขอความกรุณาจากท่านโปรดอนุเคราะห์ให้นักศึกษาได้เก็บข้อมูล เพื่อประกอบการทำวิทยานิพนธ์ ตามที่เห็นสมควรด้วย จักเป็นพระคุณยิ่ง

เสนอ ผู้อำนวยการโรงพยาบาลระยอง

- เพื่อโปรดพิจารณา
- ที่ประชุมคณะกรรมการบริหารการพยาบาล ครั้งที่ 1/2546 วันที่ 13 มกราคม 2546

ขอแสดงความนับถือ

(ศาสตราจารย์ นพ.บรรจง มไหสวริยะ)
รองคณบดีฝ่ายวิจัย ปฏิบัติราชการแทน
คณบดีบัณฑิตวิทยาลัย

13 มกราคม 2546

ติดต่ออาจารย์ผู้รับผิดชอบวิชา ผศ.ดร.อรพรรณ โตสิงห์
โทร. 0-1753-7434

APPENDIX D

Permission Letters for Using Instrument

Permission Letters for Using Instrument

Hotmail Message Page 1 of 2

MSN Home | My MSN | Hotmail | Search | Shopping | Money | People & Chat

Web page unavailable offline

Hotmail Home | Inbox | Compose | Contacts | Options | Help

kung_chaweewan@hotmail.com

Save Address(es) Block Previous Next | Close

From : Lindsay Wilson <j.t.l.wilson@stir.ac.uk>

To : "'chaweewan wanthana'" <kung_chaweewan@hotmail.com>

Subject : RE: Request for using the GOSE

Date : Wed, 4 Sep 2002 15:58:01 +0100

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Dear Chaweewan Wanthana

Thank you for your email concerning the GOSE. I am happy to confirm that you have permission to copy the scales and guidelines published in J Neurotrauma, 1998, 15, 573-585 on the understanding that the questionnaire is to be used. for research or not for profit. We also ask you not to modify the material since a key aim of the work was to produce a standard form of the GOS/GOSE.

Thank you for your interest in the GOSE, and thank you also for your consideration in contacting me to inquire about use of the material.

Best wishes

Lindsay Wilson
Professor of Psychology

Hotmail Message

Page 1 of 1

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Find: Go

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From : Renaldo.Battista@aetmis.gouv.qc.ca
To : "chaweewan wanthana" <kung_chaweewan@hotmail.com>
Subject : Rf. :
Date : Mon, 23 Sep 2002 17:40:46 -0400

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Dear Wanthana,

I discussed your request with Dr Sharon Wood-Dauphinée, a colleague who was also involved in the development of the index. Indeed, we are happy that the index will be useful in your work, hoping that it will be compatible with your context.

All the best,

Renaldo BAttista

Dr Renaldo N. Battista
Président-directeur général
Agence d'évaluation des technologies
et des modes d'intervention en santé (AETMIS)
2021, avenue Union, bureau 1040
Montréal (Québec) H3A 2S9
Téléphone : (514) 873-1334
Télécopieur : (514) 873-1369

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APPENDIX E

Data Collection Instruments

Data Collection Instruments

แบบสอบถามในการวิจัยเรื่อง

ปัจจัยที่มีอิทธิพลต่อคุณภาพชีวิตของผู้ป่วยบาดเจ็บที่สมอง

วันที่บันทึกข้อมูล…...../……../…...

เลขที่แบบสอบถาม…..…….

แบบสอบถามนี้ประกอบด้วย 4 ส่วน ได้แก่

ส่วนที่ 1 แบบบันทึกข้อมูลส่วนบุคคลของผู้ป่วยบาดเจ็บที่สมอง

ส่วนที่ 2 แบบบันทึกประวัติการเจ็บป่วย

ส่วนที่ 3 แบบบันทึกข้อมูลส่วนบุคคลของญาติผู้ดูแล /
แบบสอบถามฐานะทางเศรษฐกิจของครอบครัว

ส่วนที่ 4 ดัชนีคุณภาพชีวิตของผู้ป่วย
แบบสอบถามความสามารถของญาติผู้ดูแล

ส่วนที่ 1 แบบบันทึกข้อมูลส่วนบุคคลของผู้ป่วยบาดเจ็บที่สมอง

คำชี้แจง ให้ผู้สัมภาษณ์หรือผู้ตอบแบบสอบถามทำเครื่องหมาย ✓ ลงใน [ ] หน้าข้อความที่เป็นคำตอบและเติมข้อความที่ตรงกับความเป็นจริงลงในช่องว่างในคำตอบแต่ละข้อ

1. เพศ [ ] ชาย [ ] หญิง
2. อายุ ..... ปี
3. ศาสนา
   [ ] พุทธ [ ] คริสต์ [ ] อิสลาม [ ] อื่น ๆ (ระบุ) .....
4. สถานภาพสมรส
   [ ] โสด [ ] คู่ [ ] หม้าย [ ] หย่า [ ] แยกกันอยู่
5. สถานภาพในครอบครัว [ ] ผู้นำครอบครัว [ ] สมาชิกในครอบครัว
6. ระดับการศึกษา
   [ ] ไม่ได้รับการศึกษา [ ] ประถมศึกษา [ ] มัธยมศึกษา / ปวช.
   [ ] อนุปริญญา / ปวส. [ ] ปริญญาตรี [ ] สูงกว่าปริญญาตรี

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10. ปัญหาสุขภาพก่อนการบาดเจ็บที่สมอง
    [ ] ไม่มี [ ] มี (ระบุ) .....

ส่วนที่ 2 แบบบันทึกประวัติการเจ็บป่วย

คำชี้แจง ผู้สัมภาษณ์บันทึกข้อมูลจากแฟ้มประวัติของผู้ป่วย และจากการสอบถามจากญาติผู้ดูแล

1. สาเหตุของการบาดเจ็บที่สมอง……..
2. การวินิจฉัยโรค……
3. การวินิจฉัยโรคร่วม ……
4. การผ่าตัด [ ] ไม่ได้ผ่าตัด [ ] ผ่าตัด (ระบุ) ……
5. ระดับคะแนน Glasgow Coma Scale เมื่อแรกรับ…… คะแนน
6. ระยะเวลาที่พักรักษาตัวในโรงพยาบาล……...……วัน
7. ระยะเวลาหลังการบาดเจ็บ……..……...…วัน
8. ภาวะแทรกซ้อนที่พบ……..……..
9. ปัญหาในการสื่อสาร

   [ ] ไม่มี [ ] มี (ระบุ) ……

แบบวัดผลลัพธ์กลาสโกว์

คำชี้แจง ผู้ประเมินแบบวัดทำเครื่องหมาย ✓ ลงใน ☐ หน้าข้อความที่เห็นว่าตรงกับสภาพของผู้ป่วยมากที่สุดเพียงข้อเดียว

ระดับ	ผลลัพธ์กลาสโกว์	
1 ☐	มีอัตราตายที่สูงมาก	ประเมินระดับกลาสโกว์โคม่า (Glasgow Coma Scale) ได้เพียง 3 -4 ตั้งแต่แรก มีการบาดเจ็บที่สมองรุนแรงมากที่สุดในทันทีที่เกิดเหตุ
2 ☐	มีสภาพเหมือนพืช	ไม่สามารถช่วยเหลือตนเองได้และไม่มีปฏิกิริยาโต้ตอบแบบคนรู้เรื่อง
3 ☐	มีความพิการรุนแรงมากที่สุด	ต้องพึ่งพาผู้อื่นในการปฏิบัติกิจวัตรประจำวันขณะอยู่ที่บ้านทั้งหมดหรือเกือบทั้งหมด
4 ☐	มีความพิการรุนแรงมาก	พึ่งพาผู้อื่นในการปฏิบัติกิจวัตรประจำวันขณะอยู่ที่บ้านเฉพาะบางกิจกรรมเท่านั้น
5 ☐	มีความพิการรุนแรงปานกลาง	ช่วยเหลือตนเองในการปฏิบัติกิจวัตรประจำวันต่าง ๆ ขณะอยู่ในบ้านสามารถพึ่งพาอาศัยตนเองได้ดี …….
6 ☐	มีความพิการรุนแรงน้อย	ขณะอยู่ในบ้านสามารถพึ่งพาอาศัยตนเองได้ดี แต่ขณะใช้ชีวิตนอกบ้านต้องพึ่งพาอาศัยผู้อื่นในบางกิจกรรม ……..…
7 ☐	มีโอกาสฟื้นคืนสภาพได้ดี	สามารถช่วยเหลือตนเองได้ค่อนข้างดีแต่มีปัญหาเรื่องการมีปฏิสัมพันธ์หรือการสื่อสารกับครอบครัวและเพื่อนร่วมงาน ……..
8 ☐	มีการฟื้นฟูสภาพดีมาก	สามารถกลับเข้ามาดำเนินชีวิตได้ตามปกติ …….

ส่วนที่ 3 แบบบันทึกข้อมูลส่วนบุคคลของญาติผู้ดูแล / แบบสอบถามฐานะทางเศรษฐกิจของครอบครัว

คำชี้แจง ให้ผู้สัมภาษณ์ทำเครื่องหมาย ✓ ลงใน [ ] หน้าข้อความที่เป็นคำตอบ และเติมข้อความที่ตรงกับความเป็นจริงลงในช่องว่างในคำตอบแต่ละข้อ

1. เพศ [ ] ชาย [ ] หญิง
2. อายุ ..... ปี
3. ศาสนา [ ] พุทธ [ ] คริสต์ [ ] อิสลาม [ ] อื่นๆ (ระบุ).....
4. สถานภาพสมรส [ ] โสด [ ] คู่ [ ] หม้าย [ ] หย่า [ ] แยกกันอยู่
5. ระดับการศึกษา
   [ ] ไม่ได้รับการศึกษา [ ] ประถมศึกษา [ ] มัธยมศึกษา / ปวช.
   [ ] อนุปริญญา / ปวส. [ ] ปริญญาตรี [ ] สูงกว่าปริญญาตรี
6. อาชีพ [ ] รับราชการ [ ] รัฐวิสาหกิจ [ ] เกษตรกร [ ] ค้าขาย /ธุรกิจ
   [ ] รับจ้าง [ ] นักเรียน /นักศึกษา [ ] ว่างงาน [ ] อื่นๆ (ระบุ)...
7. ความสัมพันธ์กับผู้ป่วย เกี่ยวข้องเป็น.....
8. เวลาที่ใช้ในการดูแลผู้ป่วยในแต่ละวัน.....ชั่วโมง

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14. รายได้ของครอบครัว .....บาท/เดือน
15. ฐานะทางเศรษฐกิจของครอบครัว
    [ ] ไม่เพียงพอ [ ] เพียงพอ-ไม่มีเงินออม [ ] เพียงพอ-มีเงินออม

ส่วนที่ 4 ดัชนีคุณภาพชีวิตของผู้ป่วย

คำชี้แจง : จงเลือกตัวเลข 2 , 1 หรือ 0 หน้าข้อความที่ท่านเห็นว่าตรงกับสภาพของผู้ป่วยมากที่สุด

1. ด้านการปฏิบัติกิจกรรม	ในระยะเวลา 1 สัปดาห์ที่ผ่านมา ผู้ป่วย
2	สามารถทำงานหรือเรียนหนังสือเต็มเวลา หรือเกือบเต็มเวลาตามที่เคยทำ หรือดูแลบ้าน หรือมีส่วนร่วมในกิจกรรมที่ไม่ได้รับค่าตอบแทน หรือกิจกรรมอาสาสมัคร ไม่ว่าจะเลิกทำงานแล้วหรือไม่
1	สามารถทำงานหรือเรียนหนังสือตามที่เคยทำ หรือดูแลบ้าน หรือมีส่วนร่วมในกิจกรรมที่ไม่ได้รับค่าตอบแทน หรือกิจกรรมอาสาสมัคร แต่ต้องการความช่วยเหลืออย่างมากหรือต้องลดจำนวนชั่วโมงทำงานลง หรือต้องลาป่วย
0	ไม่สามารถทำงานหรือเรียนหนังสือได้ และไม่สามารถทำงานบ้านได้เลย
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5. ด้านมุมมอง	ในระยะเวลา 1 สัปดาห์ที่ผ่านมา ผู้ป่วย
2	สงบและมีความรู้สึกในด้านดี ยอมรับสภาพ และสามารถควบคุมสถานการณ์ของตนได้เป็นปกติ
1	บางครั้งรู้สึกมีปัญหาเนื่องจากไม่สามารถควบคุมสถานการณ์ของตนเองได้เต็มที่ หรือมีช่วงเวลาที่รู้สึกเป็นกังวลหรือซึมเศร้าเป็นพักๆ
0	มีอาการสับสนอย่างแรง หรือหวาดกลัวอย่างมาก หรือมีความกังวลและซึมเศร้าอย่างต่อเนื่อง หรือไม่รู้สึกตัว

ท่านมีความมั่นใจเกี่ยวกับสภาพของผู้ป่วยที่ท่านได้ประเมินไปมากน้อยเพียงใด โปรดวงกลมล้อมรอบตัวเลขที่แทนความรู้สึกของท่าน

มั่นใจเต็มที่	มั่นใจมาก	ค่อนข้างมั่นใจ	ไม่มั่นใจนัก	สงสัยมาก	ไม่มั่นใจเลย
1	2	3	4	5	6

แบบสอบถามความสามารถของญาติผู้ดูแล

คำชี้แจง ผู้สัมภาษณ์ทำเครื่องหมาย ○ ล้อมรอบตัวเลขที่อธิบายได้ตรงกับความรู้ ความเข้าใจ หรือความสามารถของญาติผู้ดูแลมากที่สุด โดย

0 หมายถึง ไม่รู้เลย ไม่เข้าใจเลย ไม่ได้เลย บอกไม่ได้เลย ไม่เคยเลย หรือมีค่าประมาณ 0 เปอร์เซ็นต์

> 0 และ < 100 หมายถึง มีความรู้ ความเข้าใจ ความสามารถในการดูแลที่เพิ่มขึ้นตามลำดับ หรือมีค่าตั้งแต่ 0 ถึง 100 เปอร์เซ็นต์

100 หมายถึง รู้มากที่สุด เข้าใจมากที่สุด ทำได้มากที่สุด บอกได้มากที่สุด ทำบ่อยที่สุด หรือมีค่าประมาณ 100 เปอร์เซ็นต์

1. ท่านรู้ว่าการที่ผู้ป่วยได้รับการบาดเจ็บที่สมองมีผลต่อร่างกายและการทำหน้าที่ของอวัยวะต่างๆ ของร่างกายผู้ป่วย

0 10 20 30 40 50 60 70 80 90 100

ไม่เลย มากที่สุด

2. ท่านรู้ถึงชนิด และ/หรือ ปริมาณอาหารที่ผู้ป่วยควรรับประทานให้ถูกต้องและเหมาะสม

0 10 20 30 40 50 60 70 80 90 100

ไม่เลย มากที่สุด

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30. ท่านใช้เวลาในการตัดสินใจเพื่อแก้ไขปัญหาสุขภาพของผู้ป่วยมากน้อยเพียงใด

0 10 20 30 40 50 60 70 80 90 100

ไม่เลย มากที่สุด

APPENDIX F

Testing Assumption of Multiple Regression Analysis

Testing Assumption of Multiple Regression Analysis

The data were check before conducting an analysis that consist of checking for outliers, multicollinearity, check the bivariate relationship to be sure they were linear, normal distribution, homoscedasticity (Munro, 2000: 271-275). The results for each assumption were presented as follows:

1. Normal distribution

By using a histogram of the standardized residuals to assess normal distribution, the relationship between the independent variables and dependent variable were shown as linear. Besides, the dependent variable was normally distributed for each value of the independent variable. Therefore, the residuals were fairly normally distributed, with one peak of .00 of standard deviation above the mean. It was possible to indicate that was normal distribution (Figure 3).

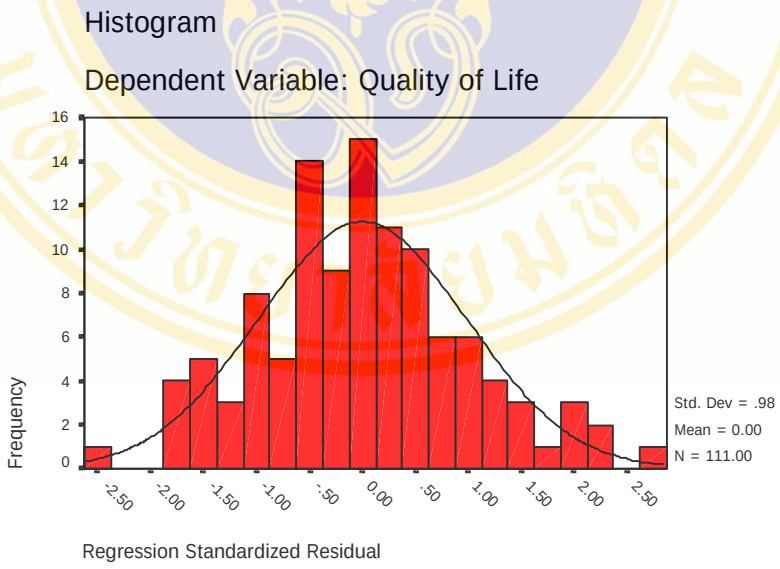

Figure 3 Histogram of residuals

2. Homoscedasticity

To check this assumption, the residuals were plotted against the predicted values and against the independent variables. The result revealed that the actual scores varied around the prediction line, with the data forming a straight line from the lower-left corner to the upper-right corner. In Figure 4 notes that the actual scores vary

around the prediction line, but in general they cluster fairly close to the line, but in general they cluster fairly close to the line.

When the residuals from a normal distribution, the plotted values fell close to the line of normal probability plot (Figure 5).

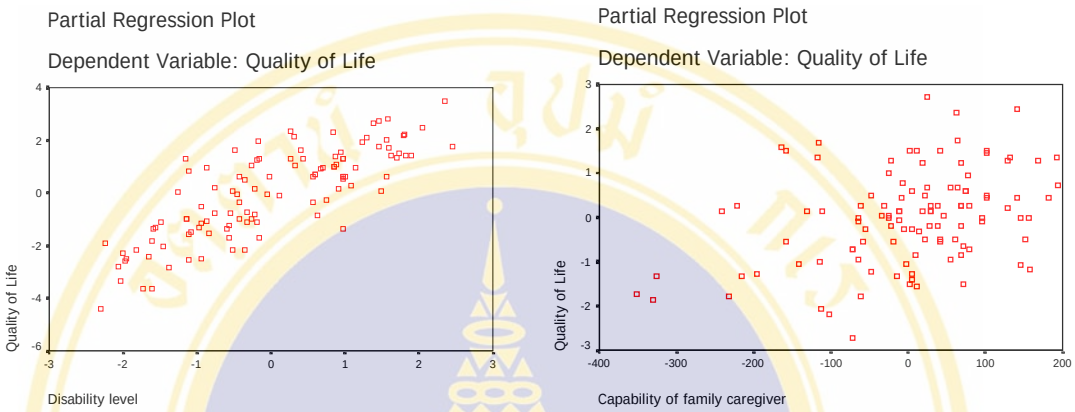

Figure 4 Scatterplot between regression residual and regression predicted valve

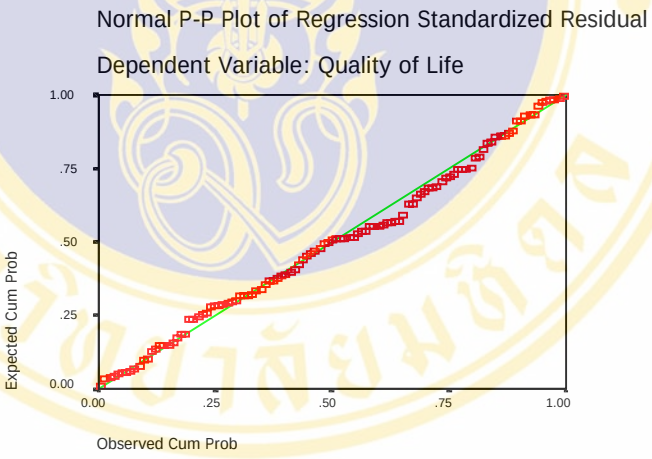

Figure 5 Normal P-P plot of regression standardized residual

3. Testing assumptions by multicollinearity

The Pearson's Product Moment Correlation was performed to evaluate the relationship between independent variables. The result of this analysis showed that the most of independent variables did not have relative among variables being evaluated. Nevertheless, disability of caregiver was slightly correlated with capability of caregiver ($r = .251$, $p < .01$) and sufficient income without saving money was moderately correlated with sufficient income with saving money ($r = -.531$, $p < .01$) (table 7).

The tolerance of a variable was used as a measure of collinearity. The tolerance values go from a low of .683 to a high of .935 (table 9). A tolerance of .683 for sufficient income without saving money means that 31.7% (1 - .683 = .317) of this variable was shared with other predictors. Because the other values for tolerance are even higher, multicollinearity was not a problem in this analysis.

As a result, it could be concluded that Multiple Regression Analysis that was employed in this study could be an appropriated statistic methodology to test the data in this study because the data met all of the assumptions required by this method.

Table 9 Unstandardized coefficients, Std. Error, standardized coefficients, t-value, and collinearity statistics of disability level, capability of family caregiver, sufficient income with saving money and sufficient income without saving money, and constant.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std.Error	Beta			Tolerance	VIF
1 (constant)	-9.886E-02	.434		-.228	.820		
Disability level	1.285	.085	.822	15.069	.000	1.000	1.000
2 (constant)	-9.396	2.498		-3.762	.000		
Disability level	1.206	.083	.772	14.502	.000	.937	1.067
Capability of family caregiver	3.465E-03	.001	.201	3.773	.000	.937	1.067
3 (constant)	-9.729	2.466		-3.945	.000		
Disability level	1.199	.082	.767	14.610	.000	.935	1.069
Capability of family caregiver	3.553E-03	.001	.206	3.923	.000	.935	1.069
Sufficient income with saving money	.462	.224	.105	2.065	.041	.997	1.003
4 (constant)	-9.985	2.369		-4.215	.000		
Disability level	1.144	.081	.731	14.108	.000	.892	1.121
Capability of family caregiver	3.585E-03	.001	.208	4.122	.000	.935	1.070
Sufficient income with saving money	.905	.256	.206	3.534	.001	.701	1.427
Sufficient income without saving money	.738	.232	.187	3.176	.005	.683	1.463

BIOGRAPHY

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