QUALITY OF LIFE OF ROAD ACCIDENT HEAD-INJURED PATIENTS AFTER CRANIOTOMY

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Abstract. This is a descriptive study that evaluates the quality of live (QOL) of road accident head-injured patients after craniotomy. It investigates the relationship between the independent variables of demographic data, health, and social and economics and four aspects of participants' QOL, satisfaction, perception, health, and social and economics. The ninety participants in the study were patients with head injuries resulting from involvement in road accidents who were attending a neurological clinic at Sapasithiprasong Hospital, Ubon Ratchathani, Thailand. Data was collected by participants completing a questionnaire. Results showed most participants had high QOL after craniotomy in satisfaction, life perception, health, and social and economics. There were negative relationships between QOL and duration of hospital stay, medical complications, and levels of disability. The study indicates the need for efficient post-operative care of head-injured patients to return them quickly to their daily lives.

INTRODUCTION

In Thailand, road accidents are one of the major causes of casualties annually. The National Police Academic Report 2000 indicated increases of 3.6% in road accidents, 3.2% in the mortality rate, and 4.4% in the disability rate (Hutheerat, 2004). In approximately one-third of cases, the most frequent vital organ injured by road accidents; especially car accidents was the head, and there was evidence of organ function disability afterwards (Sriwiwat, 2000). In year 2001, Sapasithiprasong Hospital, Ubon Ratchathani, Thailand had 19,000 patients admitted to the hospital as a result of car accidents. Of these, 2,380 had head injuries that required operations. Most patients stayed at least 6 days after the operations and 6.9% of the patients had medical complications (Sapasithiprasong Hospital, 2001).

Craniotomy is an advanced medical process designed to decrease the incidence of deaths and injury due to head trauma. It involves the opening of the skull by the creation of a bone flap or by the removal of a circular piece of bone by a trephine (trephination) (Rowland, 1995). The procedure can decrease deaths from 72 to 25% (Jenett and Teasdale, 1989). Nevertheless, patients may still be left with noticeable disabilities after the completion of therapy, the levels of which depend upon the severity of the accidents, organ damage, and ages of the patients (Carson, 1993). The disabilities may be physical, mental, and/or behavioral (Naalt *et al*, 1999). They also may affect perception, consciousness, and cognition. Some patients suffer physical and/or mental disfunction (Riedel and Shaw, 1997). Feelings of anger, impatience, depression, loss of control, and sleeping disorders are experienced (Luukinen *et al*, 1999). Also, social contact may be reduced due to post-traumatic

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stress, and professional and personal lives may become less effective (Ferrans and Powers, 1985; Wehman *et al*, 1995).

Previous studies showed the success of craniotomy was not only in terms of physical recovery but also in the improvement of the quality of life (QOL) of patients in such areas as daily living, mental condition, and social contact (Stewart-Amidei, 1995). Quality of life (QOL) is one of the aims of Thailand's national health policy to achieve patient satisfaction with their daily lives. As thirty-baht policy has been used for Thais since the year 2001, it aims to help the low income people to have a good opportunity in health services and to improve their quality of lives. However, since this health policy has started, there have been some noticeable limitations occurred including; the quality of hospital services, the quality of hospital staff performances, the hospital expenditure, etc. These limitations might affect the quality of care, especially patients who have serious illnesses and require a special care such as head injury, cardiovascular disorders (Arpapirom, 2001). In response to this initiative, this study investigated the QOL of road accident head-injured patients after craniotomy treatment at Sapasithiprasong Hospital, Ubon Ratchathani, Thailand. It also evaluated relationships between the independent variables of demographic data, health, social and economics, and aspects related to patients' satisfaction, perception, health, social, and economics of their quality of life.

This study evaluated the quality of life (QOL) of road accident head-injured patients after undergoing craniotomy as well as the relationship between independent variables (*eg*, demographic data, health, and social and economics) and the different aspects of quality of life of the patients (*eg*, satisfaction, perception, health, and social and economics).

MATERIALS AND METHODS

The study involved ninety post-operative craniotomy (from one to six months) road accident head-injured out-patients at Sapasithiprasong Hospital, Ubon Ratchathani, Thailand. It was conducted from April to September 2005. The researchers informed the participants of the study procedure, assured them of confidentiality, and received their approval to be included in the research. A QOL questionnaire was developed from the work of Zhan (1992) which focussed on four aspects: satisfaction (5 items), perception (7 items), health (15 items), and social and economics (8 items). The participants were asked to respond to the questions by use of numbers from 5 to 1 – "strongly agreed" (5), "agreed" (4), "partly agreed" (3), "disagreed" (2), and "strongly disagreed" (1). The content of each questionnaire item will be either positive or negative meaning. The totals of the participants' responses for each aspect were calculated.

Content validation of the QOL questionnaire was established by the use of a panel of experts consisting of a medical doctor, a nurse, and a physical therapist. Changes were made to it based on the panel's recommendations before its administration. A pilot questionnaire involving thirty volunteers was conducted to measure the reliability of the questionnaire items using Chronbach's coefficient alpha. An acceptable average alpha value is more than 0.7. An average alpha value of the questionnaire items was favorable (α = 0.9462).

All responses were evaluated statistically. Frequencies and percentages were calculated for demographic data. The interval and ratio relationships between the independent variables and the QOL aspects were statistically measured using Pearson's Product Moment Correlation Coefficient (r). In contrast, the relationship between nominal variables and QOL aspects were statistically measured using Point Biserial Correlation Coefficiency (rbp). Additionally, *t*-test and F-test were implemented.

RESULTS

There were ninety participants in the study. Most were male (71.1%) and Buddhists (100%). The majority was married. Forty-one (45.5%) and 32 (35.6%) were graduates of junior and senior high school, respectively. Farmers (41.1%) formed the main occupational group followed by students and governmental officers (16.7% and 16.7%, respectively). Despite their injuries, most still worked in their same occupations. Twenty-eight (31.1%) earned between 2,001 and 4,000 baht per month, and 22 (24.4%) earned between 5,001-8,000 baht per month. In most cases (85.6%), expenses in hospital were fully covered by health insurance. One to two weeks for a full recovery was the most common (65.6%) length of time. Just under a half of the patients (43.4%) took part in the study one month after their accident, and slightly more than one-third (35.6%) participated two months after. Most of participants were treated with medication or medication plus physical therapy (35.6% and 36.7%, respectively). Fifty percent of the participants had medical complications after the operation, most were able to take care of themselves after discharge (52.2%), and just under half had no disability (48.9%) (Table 1).

Results showed 38.9% of participants had slight head injuries and 43.3% had moderate injuries when admitted to hospital. After treatment, the severity of the injuries was reduced with some minor injuries left (80%) (Table 2).

The levels of quality of life (QOL) of the participants were favorable in all four aspects (see Table 3).

Results showed the relationships between the independent variables, including demographic data, health, and social and economics and the QOL of the participants were statistically significant in most cases. The participants treated with only medication had a

Table 1
Demographic data of the participants (n=90).

Demographic data	Frequency	Percentage
Gender		
Male	64	71.1
Female	26	28.9
Religion		
Buddhist	90	100.0
Marital status (before)		
Single	40	44.4
Married	46	51.1
Divorced/separated/spouse dead	4	4.4
Marital status (after)		
Single	40	44.4
Married	46	51.1
Divorced/separated/spouse dead	4	4.4
Education level		
No education	2	2.2
Junior high	41	45.5
Senior high	32	35.6
Diploma	6	6.7
Bachelor	8	8.9
Above bachelor	0	0
Role in family		
Leader of a family	45	50.0
Member of a family	45	50.0
Occupation (before)		
Jobless	5	5.6
Governmental officer	15	16.7
State enterprise officer	2	2.2
Merchant	12	13.3
Farmer	37	41.1
Cashier	13	14.4
Student	15	16.7
Miscellaneous	1	1.1
Current occupation		
Same job	52	57.8
Same job but changed position	22	24.4
Change jobs	2	2.2
Suspended jobs/school	14	15.6
Resource of income		
Yourself	12	13.3
Yourself and other family members	59	65.6
Friends/relatives	19	21.1
Average income (baht per month)		
< 2,000	8	8.9
2,001-4,000	28	31.1
4,001-5,000	11	12.2
5,001-8,000	22	24.4
8,001-10,000	7	7.8
> 10,001	14	15.6

Table 1 (continued).

Demographic data	Fre-quency	Percen-tage
Adequacy of income		
Adequate	78	86.7
Inadequate	12	13.3
Health insurance		
Fully covered	77	85.6
Partly covered	13	14.4
Health management		
Self care	47	52.2
Caregiver	43	47.8
Length of hospital stay		
1 day-1 week	12	13.3
>1-2 weeks	59	65.6
>2-6 weeks	17	18.9
> 6 weeks	2	2.2
Duration of post-operation		
1 month	39	43.4
2 months	32	35.6
3 months	13	14.4
4 months	3	3.3
5 months	2	2.2
6 months	1	1.1
Current treatment		
Medication	32	35.6
Physical therapy	11	12.2
Medication + physical therapy	33	36.7
Miscellaneous	14	15.6
Levels of disability		
No disability	44	48.9
Slight disability	25	27.8
Moderate disability	11	12.2
Severe disability	10	11.1
Medical complications after operation		
No	45	50.0
Yes	45	50.0

higher level of QOL compared to those treated with both medication and physical therapy (p=0.001, F=24.85). Similarly, participants whose expenses were covered by health insurance had a significantly better QOL compared to those having no health insurance (p=0.025, t=2.03). However, gender and marital status did not show any statistically significant relationship with the QOL of the participants (p=0.07, t=1.836, p=0.46, F=0.78, respectively).

Results of the relationship between independent variables and all four different aspects (satisfaction, perception, health, and social and economics) were favorable. Age had a statistically significant negative relationship with social and economics (r=-0.212, p=0.05). This implied that the older the participants, the worse their QOL. Additionally, the length of stay, medical complications, and levels of disability were all significantly related to the overall QOL of the participants (r=-0.658, -0.635, -0.817, p=0.01). It also indicated that participants who had short stays in hospital, and had minor complications and disabilities had better overall QOL. When compared the results between the Glasgow Coma Scale which indicated the consciousness of brain function at hospital admission and discharge and the overall QOL, the results showed a positive relationship (r=0.619, 0.677, p=0.01). This indicated that participants with a high scale had a low severity of head injury and, as a result,

Table 2
Severity of head injury at hospital admission and discharge (n = 90).

Items	Frequency	Percentage
Severity of head injury at the hospital admission		
Severe injury (3 – 8 score)	16	17.8
Moderate injury (9 – 12 score)	39	43.3
Slight injury (13 – 15 score)	35	38.9
Severity of head injury at discharge		
Severe injury (3 – 8 score)	3	3.3
Moderate injury (9 – 12 score)	15	16.7
Slight injury (13 – 15 score)	72	80.0

Table 3
Levels of quality of life (QOL) in the four aspects (n = 90).

Levels of QOL	Frequency	Percentage	Mean	SD
Overall QOL			4.16	0.61
Low (1.00-2.33 score)	2	2.2		
Moderate (2.34-3.67 score)	3	3.3		
High (3.68-5.00 score)	85	94.4		
Aspects of QOL				
1. Satisfaction			3.84	0.52
Low (1.00-2.33 score)	1	1.1		
Moderate (2.34-3.67 score)	0	0.0		
High (3.68-5.00 score)	89	98.9		
2. Perception[a]			4.20	0.48
Low (1.00-2.33 score)	1	1.1		
Moderate (2.34-3.67 score)	0	0.0		
High (3.68-5.00 score)	89	98.9		
3. Health[b]			4.19	0.87
Low (1.00-2.33 score)	6	6.7		
Moderate (2.34-3.67 score)	1	1.1		
High (3.68-5.00 score)	83	92.2		
4. Social and economics			4.27	0.51
Low (1.00-2.33 score)	1	1.1		
Moderate (2.34-3.67 score)	0	0.0		
High (3.68-5.00 score)	89	98.9		

[a]except an item *"you feel not well, depressed and concerned""*Mean 2.34, SD 0.82
[b]except these items

| *"the injury still stops you from daily living"* | Mean 2.64, SD 1.05 |
| *"you still need to go back to the hospital for more treatment after a full recovery"* | Mean 2.36, SD 1.09 |

had a high level of QOL. Participants who took care of themselves had an overall better QOL compared to those with caregivers (r =-0.606, p=0.01) (Table 4).

DISCUSSION

Most of participants in the study either retained their occupational status or remained in the same occupations but in different positions after their accidents. This, and the low level of the resultant disabilities, may be explained by the general lack of seriousness of most of the head injuries suffered by the patients. The result was similar to a previous study focusing on the disability of head injured cases. They found that most of victims had a minor disability (69.3%) with full recovery after the accidents (Deb *et al*, 1998). Similarly, another study showed favorable responses made by participants post-operatively regarding satisfaction with their daily lives, occupations, and social interactions (George and Bearon, 1980). Socially and economically, the participants were generally satisfied with their social lives, incomes, job opportunities, and support from families and friends. However, some participants' perceptions still needed to be addressed. For example, some were depressed and concerned about their health

Table 4
Relationship between independent variables and all aspects of QOL (n = 90).

Independent variables	Pearson's Product Moment Correlation Coefficient (r)				
	Overall QOL	Satisfaction	Perception	Health	Social and economics
Demographic data					
Age	-0.143	0.009	0.009	-0.170	-0.212[a]
Health					
Duration of post-operation	-0.127	-0.033	-0.130	-0.121	-0.130
Length of hospital stay	-0.658[b]	-0.399[b]	-0.529[b]	-0.696[b]	-0.458[b]
Medical complication	-0.635[b]	-0.533[b]	-0.524[b]	-0.619[b]	-0.500[b]
Levels of disability	-0.817[b]	-0.593[b]	-0.670[b]	-0.821[b]	-0.628[b]
Glasgow Coma Scale (hospital admission)	0.619[b]	0.428[b]	0.509[b]	0.618[b]	0.498[b]
Glasgow Coma Scale (on discharge)	0.677[b]	0.541[b]	0.612[b]	0.654[b]	0.527[b]
Social and economics					
Educational level	0.006	-0.038	-0.025	0.013	0.028
Average income	-0.064	-0.092	-0.107	-0.067	0.023
Health management	-0.606[b]	-0.483[b]	-0.493[b]	-0.591[b]	-0.489[b]

[a]Statistically significant at p=0.05
[b]Statistically significant at p=0.01

conditions. This may have been due to the requirement to attend medical evaluations after hospitalization, a process that interfered with their resumption of their daily lives. Such experiences are not an uncommon occurrence for post-trauma patients (Meeberg, 1993).

The relationship between independent variables and the four aspects of QOL highlighted a number of issues. Participants who received only medication had a significant better QOL compared to those treated with both medication and physical therapy (p<0.01). This can be due to the head injuries of the medication-only group of participants being classified as slight compared to the more serious nature of the medication and physical therapy group. Moreover, gender had no effect on the QOL of the participants post-operatively. This can be explained by Thai males and females in modern societies more equally fulfilling roles as the family leaders.

However, in the past Thai females were not responsible for family income compared to males, thus when males were not able to work as normal due to accidents or illness, it effected their lives. Age was shown to be a factor that affected the social and economics of the participants. This may be due to the increased healing time of older persons than younger patients, causing more disruption to occupations, social contacts, and moral support, and resulting in a decreased QOL regarding social and economic issues (Jinangkoon, 1987; Neimi et al, 1998).

Some researches have shown a better overall QOL for married than for non-married persons post-operatively due to increased family support (Joseph Sirgy, 1986; Anuroj, 1992). However, this study did not reveal any statistically significant relationship regarding marital status. Again, this should have been due to the dominant nature of the severity of

the head injury in QOL. The educational levels of participants were not statistically related to the overall QOL. Theoretically, the higher well educated persons usually had a better QOL compared to those with lower educational levels (Jaiarree, 1991; Auparabaht, 1993). It is because most of well educated persons usually knowledgeable and logical about their behaviors regarding their lives. Thus, their quality of lives (QOL) would be favorably satisfied.

In conclusion, this study indicated that some independent variables, including demographic data, health, and social and economics, had statistical significance with the QOL of the participants who had suffered head injuries and had undergone craniotomy. Previous similar results have shown that most of head injured patients fully recovered with some minor physical disabilities (Rimel *et al*, 1982). Mental and behavioral abnormalities were also affected by the severity of the injury such as mood change, amnesia, and depression (Riedel and Shaw, 1997; Naalt *et al*, 1999). The findings are of relevance to health care professionals in their evaluation of the QOL of patients generally and in the specific post-operative plans for head-injured patients, leading to efficient practices by the hospital and a quick resumption of daily life by the patients. There were some noticeable limitations addressed in the study including the length of and the number of participants in the study that need to be expanded to increase its reliability, the criteria of the duration of treatment of the participants should have been longer than just one to six months to collect more data on various patients' medical conditions. The number of participants were still limited therefore the study should have been performed in different hospital areas to see the overall picture and finally further studies should concentrate on other aspects affecting the quality of life including the appropriateness of treatment, patient health assurance, and long term medical complications.

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