

## CHAPTER 4

### RESULTS AND DISCUSSION

The purposes of this study were to test for the differences in QOL, functional ability, depression, and perceived social support from the family of the stroke survivors, by comparing stroke survivors who received and did not receive a home-based nursing intervention program. The research results are presented in five parts as follow:

Part I Demographic characteristics of the sample

Part II The difference in functional abilities between the subjects in the experimental and control groups.

Part III The difference in depression between the subjects in the experimental and control groups.

Part IV The difference in perceived social support from family between the subjects in the experimental and control groups.

Part V The difference in quality of life between the subjects in the experimental and control groups.

## *Part I Demographic Characteristics of the Sample*

### *Characteristics of the Sample*

A total of 436 cases were reviewed from four hospitals in Chiang Mai provinces between May 2004 and June 2005. Only 61 cases met inclusion criteria. All subjects who met criteria agreed to participate in the study. They were randomly assigned into experimental and control groups, 30 were in the experimental group and 31 were in control group. Three subjects from the control group dropped-out before completing the study, one died, one moved and one got worse, which makes 28 cases for the control group. The attrition rate of this study is 4.9%.

The mean age of control group was 64.4 years and the average duration after stroke occurrence was 18.9 days (Table 2). The majority of them were male (57.1%), married (64.3%), had income (57.2%) and lived in rural areas (71.4%). Approximately one-third of the subjects (32.1%) had hypertension. About 61% of the subjects in control group had moderate stroke, 92.9% was first stroke, and nearly 43% of the subjects had right brain thrombosis. Half of the subjects (53.6%) in control group had two caregivers.

Data from the experimental group showed similar demographic characteristics to the control group. The mean age was 66.2 years and the average duration after stroke occurrence was 24.1 days (Table 2). Most of the subjects were male (60.0%), married (56.7%), had income (66.7%) and lived in rural area (86.7%). Most of them were diagnosed with first stroke (96.7%), 70% had moderate stroke, 23.3% had hypertension and 33.3% had right brain thrombosis. Half of the subjects (50.0%) had two family caregivers. Comparing between experimental and control groups, it was found that both groups had no statistical difference in all characteristics (Table 1).

Table 1

*Demographic characteristics of the control and experimental groups*

Demographic Characteristics	Control group (n=28)		Experimental group (n=30)		<i>p-value</i>
	n	%	n	%	
Age (years)					
46-60	13	46.4	12	40.0	.089 <sup>a</sup>
61-70	2	7.1	10	33.3	
71-80	10	35.7	6	20.0	
>80	3	10.7	2	6.7	
Gender					
Male	16	57.1	18	60.0	1.000 <sup>c</sup>
Female	12	42.9	12	40.0	
Marital status					
Single	0	0	3	10.0	.340 <sup>a</sup>
Married	18	64.3	17	56.7	
Widowed	8	28.6	9	30.0	
Divorced / Separated	2	7.1	1	3.3	
Monthly income (baht)					
No income	12	42.9	10	33.3	.723 <sup>a</sup>
Irregular income	7	25.0	9	30.0	
Regular income (per month)					
Less than 1,000	0	0	1	3.3	
1,001-5,000	1	3.6	1	3.3	
5,001-10,000	4	14.3	2	6.7	
more than 10,000	4	14.3	7	23.3	
Living place					
Rural area	20	71.4	26	86.7	.201 <sup>c</sup>
Urban area	8	28.6	4	13.3	

Table 1 (continued)

Demographic Characteristics	Control group (n=28)		Experimental group (n=30)		<i>p-value</i>
	n	%	n	%	
<b>Severity of stroke</b>					
Minor stroke	9	32.1	6	20.0	.562 <sup>a</sup>
Moderate stroke	17	60.7	21	70.0	
Major stroke	2	7.1	3	10.0	
<b>Co-morbid disease *</b>					
No	1	3.6	3	10.0	.612 <sup>a</sup>
<b>Yes (disease related to stroke)</b>					
Hypertension	9	32.1	7	23.3	
Diabetes Milletus	1	3.6	1	3.3	
Hyperlipidemia	0	0	3	10.0	
Atrial fribillation / Ischemic heart disease	1	3.6	1	3.3	
<b>Yes (disease non-related to stroke)</b>					
Hematological system	1	3.6	0	0	.483 <sup>c</sup>
Endocrine system	0	0	1	3.3	1.000 <sup>c</sup>
Gastrointestinal system	4	14.3	4	13.3	1.000 <sup>c</sup>
Musculoskeletal system	5	17.9	9	30.0	.363 <sup>c</sup>
Other neurological system	0	0	1	3.3	1.000 <sup>c</sup>
Pulmonary system	2	7.1	2	6.7	1.000 <sup>c</sup>
Genito-urinary system	3	10.7	6	20.0	.473 <sup>c</sup>
Cancer	0	0	2	6.7	.492 <sup>c</sup>
Others	1	3.6	4	13.3	.354 <sup>c</sup>

\* each case has more than one disease

Table 1 (continued)

Demographic Characteristics	Control group (n=28)		Experimental group (n=30)		<i>p-value</i>
	n	%	n	%	
<b>Number of occurrence</b>					
First time	26	92.9	29	96.7	.605 <sup>c</sup>
Second time	2	7.1	1	3.3	
<b>Type of stroke</b>					
Hemorrhagic right brain	3	10.7	6	20.0	.310 <sup>a</sup>
Hemorrhagic left brain	0	0	3	10.0	
Thrombosis right brain	12	42.9	10	33.3	
Thrombosis left brain	9	32.1	9	30.0	
Others	4	14.3	2	6.7	
<b>Number of caregivers</b>					
1	5	17.9	8	26.7	.870 <sup>a</sup>
2	15	53.6	15	50.0	
3	6	21.4	5	16.7	
4	2	7.1	2	6.7	
<b>Health service utilization after discharge</b>					
None	18	64.3	23	76.7	.310 <sup>a</sup>
Hospital	6	21.4	6	20.0	
Home health care	4	14.3	1	3.3	

Table 2

*Comparison of the age of stroke survivors and the duration after stroke occurrence between the experimental and control groups*

	Experimental group $\bar{X} \pm SD$ (range)	Control group $\bar{X} \pm SD$ (range)	Z <sup>d</sup>	p-value
Age of stroke survivors (years)	66.17 $\pm$ 10.54 (48 – 85)	64.39 $\pm$ 13.39 (46 – 82)	0.880	.379
Duration after stroke occurrence (days)	24.10 $\pm$ 35.54 (3 – 150)	18.93 $\pm$ 25.66 (2-120)	0.464	.464

d = Mann-Whitney U test

In addition, the data showed that most subjects in both groups were in mildly severe dependent level of functional abilities and high level of perceived social support from family. There were only five subjects in experimental group that had depression. However, the comparison between experimental and control groups showed no significant difference in level of functional abilities, level of depressive symptom and level of perceived family social support (Table 3).

Table 3

*Level of functional abilities, depressive symptom and perceived family social support in the control and experimental groups*

Variables	Control group (n=28)		Experimental group (n=30)		<i>p-value</i>
	n	%	n	%	
<b>Level of functional abilities</b>					
Totally dependent	2	7.1	3	10.0	.822 <sup>a</sup>
Severe dependent	4	14.3	7	23.3	
Moderately severe dependent	2	7.1	1	3.3	
Mildly severe dependent	12	42.9	10	33.3	
Totally independent	8	28.6	9	30.0	
<b>Level of depressive symptom</b>					
Normal	28	100	25	83.3	.053 <sup>c</sup>
Depression	0	0	5	16.7	
<b>Level of perceived family social support</b>					
Low	1	3.6	1	3.3	.680 <sup>a</sup>
Moderate	4	14.3	7	23.3	
High	23	82.1	22	73.3	

a =  $\chi^2$ . b = t-test for two independent samples. c = Fisher's Exact Test

*Part II The Difference in Functional Abilities Between the Experimental and*

*Control Groups*

*Question # 1. Do stroke survivors who receive a home-based nursing intervention program report better functional ability than those who do not receive the intervention?*

Effect of home-based nursing intervention program on functional ability was evaluated by Barthel Activities of Daily Living Index (BAI) score. As BAI scores of both control and experimental groups were not in normal distribution, non-parametric Mann-Whitney U test was used to test for mean difference over time.

Considering functional abilities of both groups at each point of measurement, it was found that functional abilities of the experimental group increased in week-6 and week-12, but for the control group, the score increased in week 6 and remained unchanged in week 12 (Figure 4).

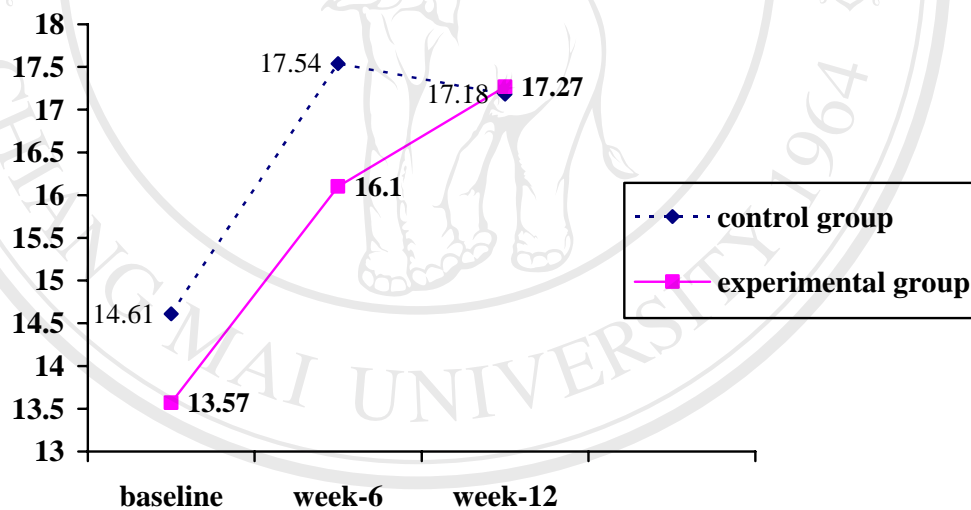


Figure 4. Changes in functional abilities of control and experimental groups at baseline, week-6 and week-12



Mann-Whitney U test was used to test the difference in functional abilities between control and experimental groups at each point of measurement. It was found that there was no significant difference between the two groups in functional abilities at baseline, week-6 and week-12 (Table 4).

Table 4

*Comparison of functional abilities between control and experimental groups at baseline, week-6 and week-12*

BAI	Mean score (mean rank)		Z <sup>d</sup>	p-value
	Control gr. (n=28)	Exp gr. (n=30)		
Baseline	14.61 (30.32)	13.57 (28.73)	0.363	0.717
Week-6	17.54 (31.13)	16.10 (27.98)	0.776	0.438
Week-12	17.18 (29.32)	17.27 (29.67)	0.089	0.929

d = Mann-Whitney U Test

Likewise, the difference in functional abilities at baseline, week-6, and week-12 of control and experimental groups was tested. There was a significant difference in both groups ( $p < 0.001$ ), as shown in Table 5. And when the mean scores at week-6 and week-12 of both groups were considered, the result showed that in the experimental group the score was increasing with time but in the control group it was decreased slightly between week-6 and week-12.

Table 5

*Changes in functional abilities of control and experimental groups over time*

BAI	Baseline X±SD (range)	6-week X±SD (range)	12-week X±SD (range)	$\chi^2$	df	p- value
Control group (n = 28)	14.61±6.05 (1-20)	17.54±4.39 (3-20)	17.18±5.08 (4-20)	21.13 <sup>c</sup>	2	.000**
Experimental group (n = 30)	13.57±6.52 (1-20)	16.10±5.18 (5-20)	17.27±4.26 (6-20)	21.00 <sup>c</sup>	2	.000**

c = Friedman two-way ANOVA test

\*\* p < .001

The comparison of functional abilities between baseline and week-6, week-6 and week-12, and baseline and week-12 of was done in experimental and control groups. Results from Post Hoc comparison for the Friedman test calculation (Appendix Q) indicated that in the experimental group, there was statistically significant difference between baseline and week-12 ( $p < 0.05$ ). In control group, the significant differences were found between baseline and week-6, and baseline and week-12, but not between week-6 and week-12 (Table 6).

Table 6

*Post Hoc comparison for Friedman Test of functional abilities in control and experimental groups*

BAI	Mean score			(1)vs(2)*	(1)vs(3)*	(2)vs(3)
	Baseline (1)	6-week (2)	12-week (3)			
Control group (n = 28)	14.61	17.54	17.18			
Experimental group (n = 30)	13.57	16.10	17.27		(1)vs(3)*	(2)vs(3)

*Part III The Difference in Depression Between the Experimental and Control groups*

*Questions # 2. Do stroke survivors who receive a home-based nursing intervention program have lower depression than those who do not receive the intervention?*

Post-stroke depression was determined by Thai Geriatric Depression Scale (TGDS) score. As depression scores of the experimental group was not in normal distribution, Mann-Whitney U Test was used to test for mean difference over time.

The comparison of depression between control and experimental groups at baseline, week-6, and week-12 indicated that there was a significant difference between both groups at baseline (Table 7).

Table 7

*Comparison of depression between control and experimental groups at each point of measurement*

TGDS	Mean score (mean rank)		Z <sup>d</sup>	p-value
	Control group (n=28)	Experimental group (n=30)		
Baseline	3.93 (24.75)	5.80 (33.93)	2.079	0.038*
Week-6	3.39 (26.98)	4.10 (31.85)	1.105	0.269
Week-12	3.75 (28.78)	3.97 (29.23)	0.113	0.910

Z<sup>d</sup> = Mann-Whitney U Test

\* p < .05

However, when the number of stroke survivors with depressive symptoms in both groups was considered, it was found that the number of stroke survivors with depressive symptoms in the experimental group decreased over time, from five cases at baseline to three cases in week-6, and none in week-12, while in the control group, there were no stroke survivors with depressive symptoms at baseline but one in

week-6 and week-12. In addition, the difference in the number of depression case at each point of measurement in control and experimental groups were tested, the result

showed significant difference in the number of depression case between baseline, week-6, and week-12 only in the experimental group (Table 8).

Table 8

*The number of stroke survivors with depressive symptoms between experimental and control groups at baseline, week-6, and week-12*

Group	Level of depression	Baseline N (%)	Week-6 N (%)	Week-12 N (%)	Q	p-value
Experimental group	Normal	25 (83.3)	27 (90.0)	30 (100.0)	6.333	.042*
	Depression	5 (16.7)	3 (10.0)	0 (0)		
Control group	Normal	28 (100.0)	27 (96.7)	27 (96.4)	1.000	.607
	Depression	0 (0)	1 (3.6)	1 (3.6)		

Q = Cochran Test

\*p < .05

In addition, Friedman test was used to compare the difference in mean scores of control and experimental groups between baseline and week-6, week-6 and week-12, and baseline and week-12. The finding showed that the depression score was significantly decreasing over time only in the experimental group (Table 9). The depression mean score in control group showed no significant difference over time (figure 5).

Table 9

*Changes in depression score of control and experimental groups over time*

TGDS	Baseline X±SD (range)	6-week X±SD (range)	12-week X±SD (range)	$\chi^2$	df	p-value
Control group (n = 28)	3.93 ± 2.94 (0-9)	3.39 ± 2.91 (0-11)	3.75 ± 3.37 (0-10)	0.021 <sup>f</sup>	2	.990
Experimental group (n = 30)	5.80 ± 3.41 (0-11)	4.10 ± 2.94 (0-10)	3.97 ± 3.18 (0-9)	10.560 <sup>f</sup>	2	.005*

f = Friedman two-way ANOVA test

\* p < .05

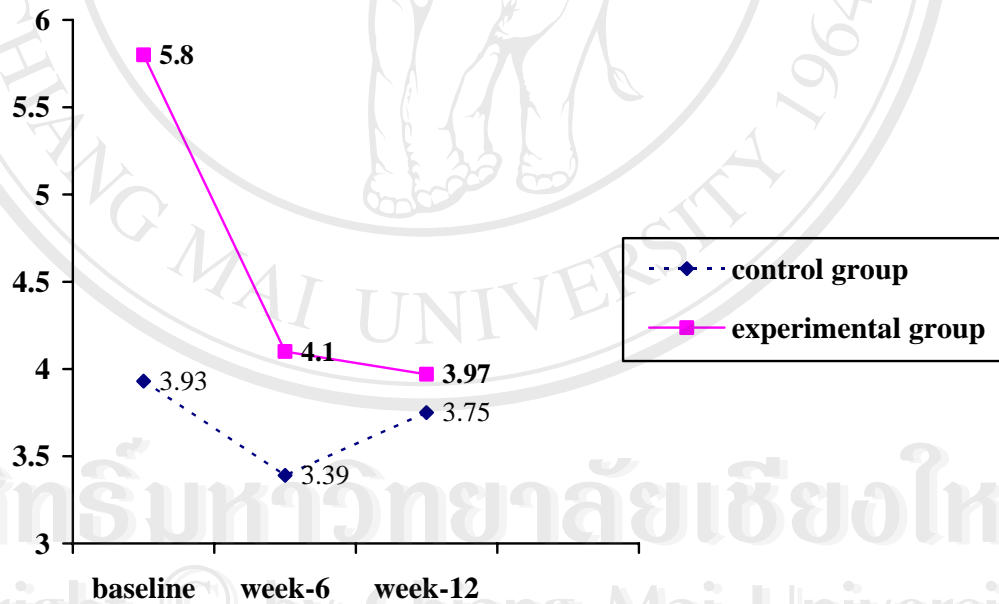


Figure 5. Change in mean score of TGDS of the control and experimental groups at baseline, week-6 and week-12

As the depression score in the experimental group significantly decreased over time, Post Hoc comparison for the Friedman test was conducted. The result showed that there was a significant difference in depression scores between baseline and week-6, and baseline and week-12 (Table 10).

Table 10

*Post Hoc comparison for Friedman Test in depression of the experimental group*

TGDS	Mean score			(1)vs(2)*	(1)vs(3)*	(2)vs(3)
	Baseline (1)	6-week (2)	12-week (3)			
Experimental group (n = 30)	5.80	4.10	3.97			

*Part IV The Difference in Perceived Social Support from Family Between the Experimental and Control Groups*

*Questions # 3 Do stroke survivors who receive a home-based nursing intervention program report higher perceived social support from family than those who do not receive intervention?*

Modified Perceived Social Support from Family (MPSS-Fa) score indicated perceived social support from family of the sample. At baseline, both experimental and control groups had high level (14-20) of perceived social support from family. In addition, comparison of MPSS-Fa mean scores between both groups showed no

significant difference (Table 11). The MPSS-Fa mean scores in both groups increased over time, as shows in figure 6. Likewise, the results from Friedman test showed no significant differences in perceived social support from family over time in both groups, as shown in Table 12.

Table 11

*Comparison of perceived social support from family between the control and experimental groups at each point of measurement*

MPSS-Fa	Mean score (mean rank)		Z <sup>d</sup>	p-value
	Control gr. (n=28)	Exp gr. (n=30)		
Baseline	15.75 (28.64)	16.17 (30.30)	0.377	0.706
Week-6	16.32 (28.71)	16.43 (30.23)	0.346	0.729
Week-12	16.57 (27.41)	17.40 (30.43)	0.698	0.485

d = Mann-Whitney U Test

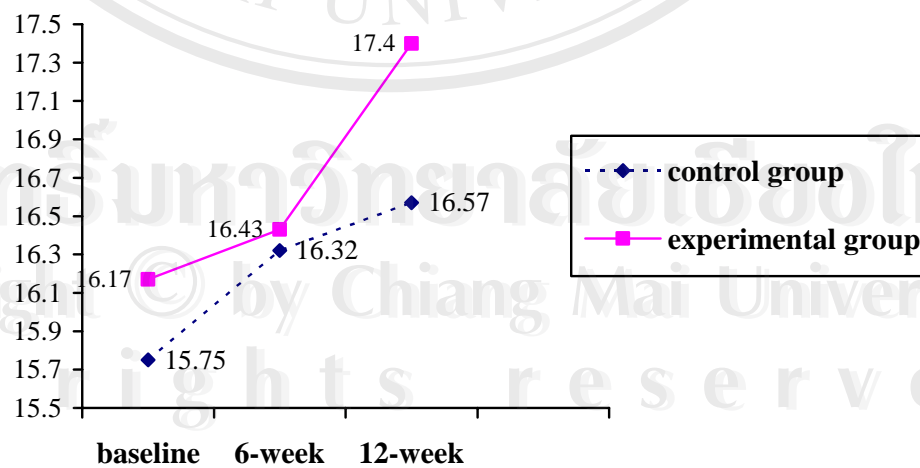


Figure 6. Changes in perceived support from family of control and experimental groups



Table 12

*Changes in perceived social support from family (MPSS-Fa) of control and experimental groups over time*

MPSS-Fa	Baseline X $\pm$ SD (range)	6-week X $\pm$ SD (range)	12-week X $\pm$ SD (range)	$\chi^2$	df	p-value
Control group (n = 28)	15.75 $\pm$ 4.22 (3-20)	16.32 $\pm$ 3.93 (5-20)	16.57 $\pm$ 3.75 (6-20)	0.020 <sup>f</sup>	2	.990
Experimental group (n = 30)	16.17 $\pm$ 3.74 (5-20)	16.43 $\pm$ 4.43 (0-20)	17.40 $\pm$ 3.22 (5-20)	3.282 <sup>f</sup>	2	.194

f = Friedman two-way ANOVA test

*Part V The Difference in Quality of Life Between the Experimental and Control groups*

*Questions # 4. Do stroke survivors who receive a home-based nursing intervention program report higher quality of life than those who do not receive the intervention?*

Stroke Impact Scale (SIS) was used to evaluate QOL of stroke survivors.

Figure 7 shows the mean SIS total score for the control and experimental groups at baseline, week-6, and week-12. The difference in SIS mean scores between control and experimental groups at baseline, week-6, and week-12 were tested. The results showed no significant difference between the two groups (Table 13). However, when the SIS mean scores of both groups at baseline and week-12 were considered, it was found that the score at baseline was higher in the control group than in the experimental group but the SIS score at week-12 in the control group was lower than the experimental group.

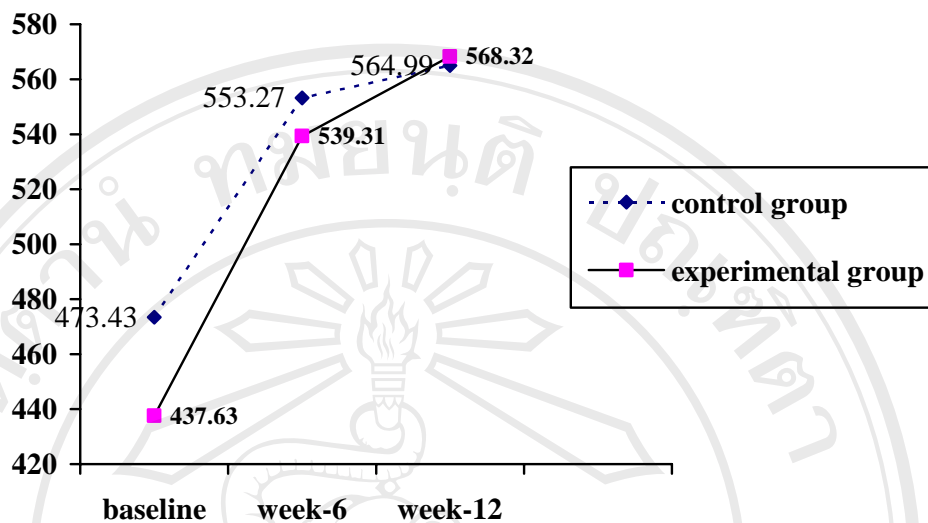


Figure 7. Changes in QOL of the control and experimental groups at baseline, week-6 and week-12

Table 13

Quality of life of control and experimental groups at baseline, week-6, and week-12

QOL	Control group (N=28)	Experimental Group (N=30)	t	p-value
	Mean $\pm$ SD	Mean $\pm$ SD		
Baseline	473.43 $\pm$ 155.66	437.63 $\pm$ 148.05	.920	0.362
Week-6	553.27 $\pm$ 148.05	539.31 $\pm$ 166.89	.336	0.738
Week-12	564.99 $\pm$ 175.22	568.32 $\pm$ 133.07	.082	0.935

t = t-test for independent samples

At baseline, the mean scores of overall QOL and each domain of QOL in the control and experimental groups were not significant difference. The mean score of all sub-domains except communication sub-domain in the control group seemed to be higher than in the experimental group. However, the differences in all scores were not statistically significant (Table 14).

Table 14

*Inter-group comparison of mean scores for the overall and sub-domains of the SIS at baseline*

Stroke Impact Scale	Control group (N = 28)	Experimental group (N = 30)	t	p- value
	Mean $\pm$ SD	Mean $\pm$ SD		
Overall	473.43 $\pm$ 155.66	437.63 $\pm$ 140.76	.920	.362
Strength	53.57 $\pm$ 28.59	40.62 $\pm$ 26.50	1.790	.079
Memory	87.12 $\pm$ 18.63	86.31 $\pm$ 19.61	.161	.873
Emotion	76.58 $\pm$ 17.88	75.93 $\pm$ 20.88	.127	.900
Communication	87.24 $\pm$ 15.53	89.76 $\pm$ 12.99	.671	.505
ADL	47.52 $\pm$ 29.66	44.50 $\pm$ 23.51	.431	.668
Mobility	48.40 $\pm$ 32.24	38.24 $\pm$ 31.01	1.223	.227
Hand function	32.14 $\pm$ 37.97	28.83 $\pm$ 35.08	.345	.731
Social participation	40.87 $\pm$ 25.77	33.44 $\pm$ 25.54	1.102	.275

t = t-test for two independent samples

As QOL scores in both groups were normally distributed, the score had homogeneity of variance, and randomization was used to select subjects in the

experimental and control groups, one factor repeated measures ANOVA was used to test the differences in overall and sub-domains of QOL at baseline, week-6, and week-12. When using repeated measure ANOVA to compare changes in QOL between two groups over time, the results showed that there were no significant differences in QOL. When the QOL scores were compared within each group, the result indicated that there were significant difference in QOL at baseline, week-6, and week-12 in both groups (Table 15).

Table 15

*The mean difference of QOL score between and within groups*

Source of variation	SS	df	MS	F <sup>r</sup>	p-value
Within subject					
Time	405507.17	2	202753.59	55.477	.000**
Time x group	11141.41	2	5570.71	1.524	.222
Error	409330.62	112	3654.74		
Between subject					
Group	10401.56	1	10401.561	.164	.687
Error	3561516.712	1	63598.513		

r = repeated measures ANOVA

\*\* p < .001

When the change in QOL score from baseline was compared between experimental and control groups at week-6 and week-12, it was found that the change of scores in the experimental group were more than in the control group. In addition, the paired t-test was done to compared the difference between mean difference scores of QOL between baseline and week-6, week-6 and week-12, baseline and week-12 of

control and experimental groups, the results revealed that there were significant difference in all pairs in the experimental group, while in control group, it was showed that there were significant difference only at week-6 and week-12, compared with baseline but not between week-6 and week-12 (Table 16).

Table 16

*Change in mean scores of QOL between baseline and week-6, week-6 and week-12, and baseline and week-12 of control and experimental groups*

QOL	Control group				Experimental group			
	Mean (d)	SD	t	Sig.	Mean (d)	SD	t	Sig.
Baseline and week-6	79.83	93.05	4.540	.000**	101.68	95.91	5.807	.000**
Week-6 and week-12	11.72	60.64	1.032	.316	29.01	77.39	2.054	.049*
Baseline and week-12	91.55	97.97	4.945	.000**	130.69	82.07	8.722	.000**

t = paired t –test.

\*\* = p < .001. \* = p < .05.

When the mean scores of QOL sub-domains in both groups were considered, as shown in Table 17, it was found that all sub-domains in the experimental group increased over time, whereas some sub-domains in the control group decreased.

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Table 17

Mean scores of QOL sub-domains of control and experimental groups at baseline, week-6, and week-12

Variable	Baseline X <sub>±</sub> SD	6-week X <sub>±</sub> SD	12-week X <sub>±</sub> SD
Strength			
control gr. (n = 28)	53.57 <sub>±</sub> 28.59	53.37 <sub>±</sub> 26.53	56.26 <sub>±</sub> 28.15
exp gr. (n = 30)	40.62 <sub>±</sub> 26.50	48.33 <sub>±</sub> 31.31	53.58 <sub>±</sub> 28.57
Memory			
control gr.	87.12 <sub>±</sub> 18.63	89.91 <sub>±</sub> 14.54	87.61 <sub>±</sub> 23.55
exp gr.	86.31 <sub>±</sub> 19.61	91.31 <sub>±</sub> 14.52	94.29 <sub>±</sub> 9.55
Emotion			
control gr.	76.58 <sub>±</sub> 17.88	83.23 <sub>±</sub> 16.01	82.43 <sub>±</sub> 17.53
exp gr.	75.93 <sub>±</sub> 20.88	77.59 <sub>±</sub> 19.54	79.65 <sub>±</sub> 15.95
Communication			
control gr.	87.24 <sub>±</sub> 15.53	95.54 <sub>±</sub> 9.30	94.52 <sub>±</sub> 12.39
exp gr.	89.76 <sub>±</sub> 12.99	96.33 <sub>±</sub> 11.27	96.79 <sub>±</sub> 7.64
ADL			
control gr.	47.52 <sub>±</sub> 29.66	65.91 <sub>±</sub> 26.24	70.00 <sub>±</sub> 27.62
exp gr.	44.50 <sub>±</sub> 23.51	64.50 <sub>±</sub> 27.26	68.77 <sub>±</sub> 23.64
Mobility			
control gr.	48.40 <sub>±</sub> 32.24	64.90 <sub>±</sub> 30.80	69.55 <sub>±</sub> 30.60
exp gr.	38.24 <sub>±</sub> 31.01	61.85 <sub>±</sub> 33.40	67.32 <sub>±</sub> 30.19
Hand function			
control gr.	32.14 <sub>±</sub> 37.97	50.18 <sub>±</sub> 41.42	48.57 <sub>±</sub> 42.09
exp gr.	28.83 <sub>±</sub> 35.08	54.00 <sub>±</sub> 46.19	58.67 <sub>±</sub> 42.06
Social participation			
control gr.	40.87 <sub>±</sub> 25.77	50.24 <sub>±</sub> 31.37	56.04 <sub>±</sub> 33.72
exp gr.	33.44 <sub>±</sub> 25.54	45.42 <sub>±</sub> 36.24	49.27 <sub>±</sub> 29.21

Additional analysis was done to compare the difference in sub-domains of QOL between control and experimental groups at baseline, week-6, and week-12, the results showed that there was no significant difference in all sub-domains (Table 18).

Table 18

*The mean difference in sub-domains of SIS score between control and experimental groups over time*

Source	SS	df	MS	F <sup>e</sup>	p-value
<b>Strength</b>					
Within subject	1771.71	2	885.85	4.595	.012*
Time	837.40	2	418.70	2.172	.119
Time x group	21591.92	112	192.79		
Error					
Between subject	2061.20	1	2061.20	1.018	.317
Group	113351.34	56	2024.13		
Error					
<b>Memory</b>					
Within subject	641.68	2	320.84	2.757	.068
Time	427.94	2	213.97	1.838	.164
Time x group	13035.87	112	116.39		
Error					
Between subject	254.94	1	254.94	0.387	.537
Group	36932.03	56	659.50		
Error					
<b>Emotion</b>					
Within subject	785.34	2	343.19	2.63	.077
Time	182.03	2	68.61	0.53	.593
Time x group	14858.60	112	130.48		
Error					
Between subject	397.61	1	397.61	0.556	.459
Group	40082.607	56	715.761		
Error					

Table 18 (continued)

Source	SS	df	MS	F <sup>e</sup>	p-value
<b>Communication</b>					
Within subject	2050.76	2	1025.38	15.300	.000**
Time	25.78	2	12.89	0.192	.825
Time x group	7505.89	112	67.02		
Error					
Between subject	149.30	1	149.30	0.530	.469
Group	15762.03	56	281.47		
Error					
<b>ADL</b>					
Within subject	18003.44	2	9001.72	63.839	.000**
Time	27.99	2	13.99	.099	.906
Time x group	15792.73	112	141.01		
Error					
Between subject	154.58	1	154.76	.086	.771
Group	100937.91	56	1802.46		
Error					
<b>Mobility</b>					
Within subject	20445.31	2	10222.65	33.590	.000**
Time	550.66	2	275.33	0.905	.408
Time x group	34085.35	112	304.33		
Error					
Between subject	1149.44	1	1149.44	0.487	.487
Group	131515.98	56	2348.50		
Error					
<b>Hand function</b>					
Within subject	19387.44	2	9693.72	16.771	.000**
Time	1302.96	2	651.48	1.127	.328
Time x group	64735.33	112	577.99		
Error					
Between subject	543.16	1	543.16	.140	.710
Group	217203.39	56	3878.63		
Error					
<b>Social participation</b>					
Within subject	7294.03	2	3647.02	13.084	.000**
Time	53.35	2	26.68	0.096	.909
Time x group	31269.91	112	278.75		
Error					
Between subject	1746.86	1	1746.86	0.778	.381
Group	125710.77	56	2244.84		
Error					

e = repeated measures ANOVA

\*\* p &lt; .001



### *Discussion*

This study tested the effectiveness of a home-based nursing intervention focused on functional ability, depression, perceived social support from family and QOL.

Results from this study demonstrated that functional ability of stroke survivors in experimental group increased from baseline to week-6 and week-12 after the intervention, whereas in the control group, it increased from baseline at only week-6, but decreased slightly in week-12. The results also demonstrated that there was no significant difference in functional ability between experimental and control groups.

The increase of score at week-6 in both groups, even the control group, showed that the functional ability may regain by itself. According to Kalra (1998), spontaneous recovery of functional ability, in particular, can be found within a first few weeks after stroke with a further 5 – 10 % occurring later on. However, the greater increase in functional ability in the experimental group somehow suggested that the intervention may be effective. The functional ability in the experimental group continued to rise till week-12, while the score in the control group leveled off and remained unchanged.

At presented earlier (Table 1) both experiment and control groups are similar in terms of demographic characteristics and stroke related data. Therefore, these factors might not be able to explain the insignificant difference between groups.

However, results in this study indicated that the number of cases which had an improvement in functional ability from baseline to week-12 in the experiment group

was more than in the control group. In control group, six cases (21.4%) had increased in functional ability at week-6 and then decreased in week-12 while there was only one case (3.3%) in experimental group (Appendix R). The explanation for the lack of continued improvement in functional ability in the control group is that after they were discharged from hospital, they did not receive any additional education or support from health care professionals. They might have no one to consult if they had rehabilitation or health problems. In contrast to the control group, stroke survivors in experimental group received a home-based nursing intervention program, in which a professional nurse provided guidance and assistance to the survivor and the family caregiver. With the support from the trained family, the survivors were more likely to do physical rehabilitation themselves. Furthermore, the family caregiver who was educated about caring for stroke survivors was more likely to do physical rehabilitation to the survivor regularly. According to Sathirapanya et al (2002), stroke survivors whose caregivers got health education and training were able to do ADL by themselves by week-2 and their independence continued rising until week-12 and then became sustainable. Moreover, co-morbid disease especially disease in musculoskeletal and genito-urinary system may be an obstacle to do physical rehabilitation. This study showed more subjects in experimental group who had musculoskeletal system and genito-urinary system disease than in control group.

Therefore, stroke survivors in control group might not be able to continue improvement in their functional ability.

Regarding depression, as found in this study, depressive symptoms in the control group reduced in week-6 but increased again in week-12. This change of depression score was congruent with that of functional ability. It, therefore, suggests

a relationship between depression and functional ability. Lai and colleague (2002) found that stroke patients with depressive symptoms progressed slower in achieving independence of functional abilities compared to patients without depressive symptoms. When the functional ability of the stroke survivor in control group increased at week-6, the depression at that time was decreased, but when functional ability decreased again in week-12 that made the depression score increased.

From the findings that in the experimental group, depression significantly decreased over time, and the number of depressive symptoms in this group decreased from 16.7% at baseline to 0% over the period of three months, it demonstrated that a home-based nursing intervention program is effective in reducing depression. When the stroke survivor and the caregiver were educated and supported, they realized that they could control their own lives, so the depression was reduced. This was consistent with Sathirapanya and colleague's (2002) study, which found that empowerment could reduce depression in stroke patients and Johnson and Pearson's (2000) study, which reported a group structured education course could reduce depression in stroke survivors living in the community.

Effect of a home-based nursing intervention program on level of depression of stroke survivors was examined over 12 weeks. The finding of the study showed that there was significant difference in depression score between experimental and control groups at baseline. The experimental group had higher depression than the control group. When depression was measured at week-6 and week-12 after the intervention, the difference between the experimental and control groups was not found. The absence of difference in depression between experimental and control groups in this study may be due to the floor effect of the depression score, or the

instruments used are not sensitive enough to detect changes in depression over time. Since the depression score in control group was in normal level since at baseline, the effective intervention can only maintain depression score but the depression score could not be reduced. On the contrary, the depression score in experimental group was high at baseline so when the score decreased to normal range, however, there was no statistically significant difference between the groups.

Regarding perceived social support from family, the study findings revealed a high level of perceived social support from family in both experimental and control groups at baseline. Comparing between experimental and control groups, it was also found that there was no statistically significant difference in this variable. This might be due to the ceiling effect of perceived social support from family score which means the score of both groups had already been at the highest level. Therefore, no matter how effective the intervention, the perceived social support from family could not be increased. Normally the Thai older person will be taken care of by the younger family member, especially when ill. In this study it was found that mean age of stroke survivors was 66 years old and 56.7% of the sample was older than 60 years old. They were cared for by spouses and adult children. Knodel and Chayovan (1997) found evidence that around 90% of the elderly persons in Thailand coresided with a child or saw a child daily, 84% coresided or lived next door to a child, 11.9% lived with a spouse, and almost 50% lived in a 3-generational household. For Thai culture, one of the prime responsibilities placed on children is that of taking care of parents in their old age. They do not feel inconvenient by the duty of caring for aged parents. This might be the reason why the survivors perceived a high level of support from their family.

Quality of life of stroke survivors after receiving a proposed home-based nursing intervention program was also evaluated. Based on the findings, there is substantial evidence that a home-based nursing intervention program can improve QOL of the survivors. Effect of the program on QOL of stroke survivor was evaluated by an increase in level of perceived impact of stroke, improvement in doing ADL, reduction of depression, and increase in perceived social support from family within 6-12 weeks. The result showed significant increase in QOL and functional ability, as well as a reduction of depression in the experimental group. However, perceived social support from family was high for both groups and showed no significant increase over time.

In this study, the result showed the effectiveness of a proposed program in increasing QOL over time. This finding was consistent with the study of 38 ischemic stroke patients attending Songkhla Neuropsychiatric hospital, which reported that the empowerment program was effective in improvement of QOL among stroke patients (Sathirapanya et al., 2002).

Since in this study, the almost all of stroke survivors was firstly occurred, it was possible that after the survivors and family caregivers realized that they had to go back home with physical impairments, disabilities, and handicaps, they become anxious or stressful (Ahlsio et al., 1984). The survivors and family caregivers need help from others, especially from health care providers. The discussion between the investigator and stroke survivors about their illness helps them better understand their problems. In addition to providing education, skill training, supporting, and counseling methods help the stroke survivors and their caregivers know how to control and correct these problems. During the intervention, a good relationship

developed between the investigator and the survivor. The stroke survivor and family caregiver became active participants in the stroke survivor's care. With regards to empowering the survivors and their caregivers and emphasizing in their self-care, the researcher can successfully develop their capacity for self-care and health responsibility. The survivor and caregiver can apply knowledge and instruction from the program to solve their health problems in their own way.

Other reasons for an increase in QOL of stroke survivor in the experimental group are the improvement of functional ability and the reduction of depression over time. From the study framework, QOL resulted from functional ability, level of depression and perceived family social support. Many studies reported that functional ability was positively associated with stroke survivors' QOL (Carod-Artal et al., 2000; King, 1996; Sathirapanya et al., 2002), while depression had negative effect on QOL (Bay, 2001; Sathirapanya et al., 2002). In addition, Kim, et al. (1999) found that depression was an important predictor of QOL in stroke survivor.

For the control group, the QOL also significantly increased over time, but the increment was less than in the experimental group. The explanation for an increase in QOL score in this group may be because of the increase in functional ability from baseline to week-6 and the decrease in depression score at week-6. However, the increases leveled off at week-6 and did not continue to improve. When the functional ability decreased again in week-12, the survivor felt powerless or helpless. Feeling loss of control, they were depressed and hopeless for recovery (Miller, 1983).

However, results in this study indicated that there was no significant difference in QOL between experimental and control groups at week-6 and week-12. The non-significant difference between both groups may be because a health

education strategy that was used in this study needs large sample size. Since this is the first study that used a health educational strategy to enhance QOL of stroke survivors by focusing on factors that affect QOL, there had been no previous data on which to calculate numbers needed to achieve sufficient statistical power. The finding may indicate that the larger sample size may be able to show a clear difference between the subjects in each group.

Moreover, the non-significant differences in QOL between experimental and control groups might be because the subjects in control group become more aware of problems rising after the stroke event and of gaps in their own knowledge. This might have led the subjects and caregivers in the control group to seek information on their own, which might have been a confounding factor. Besides, the control group also received the same booklets as the experimental group, which contained information that was beneficial to both stroke survivors and caregivers. The booklets can help in transmitting information (Heady & Hooper, 2002). The stroke survivor and family caregiver in control group may have followed the recommendations and strictly practiced to make them better. Even though, they did not receive the intervention, they were still beneficial from the information provided. Moreover, there were more subjects living in urban area in control group (8 cases) than in the experimental group (4 cases), so they might be able to find more information. Therefore, the significant difference between QOL of the experiment and control groups was not demonstrated in this study.