CHAPTER 3

METHODOLOGY

The objective of this chapter is to describe the research methods utilized in this study. This chapter includes a description of the research design, population, sample criteria and setting, research instruments, data collection procedures, data analysis and a discussion of measures taken to protect the human subjects.

Research Design

The purpose of this study was to test for the differences in functional ability, depression, perceived social support from family, and QOL of stroke survivors who received and not receive a 3-month home-based nursing intervention program. The repeated measures experimental design was used to achieve the purpose and eliminate extraneous variables. The experimental group received a 3-month home-based nursing intervention program, while the control group received only two booklets. The intervention program was implemented for the experimental group after baseline data were collected, whereas the control group received no intervention from the investigator. Follow-up data were collected on both groups at week-6 and week-12 (Figure 2).

Experiment group	R	O_1	X	O_2	X	O_3
Control group	R	O_1		O_2		O_3

R = Randomization

O = Measurement

X = Intervention

Figure 2. The repeated measures experimental design used in this study

Population and Sample

The population of this study was people aged 45 years and over, diagnosed with a stroke or cerebrovascular accident (CVA) by a neurologist, who had been discharged from one of four hospitals within the last year. The four hospitals in Chiang Mai province were Maharaj Nakorn Chiang Mai, Nakornping, Neurological hospital, and McKane rehabilitation Center.

Sample Size

To determine sample size in this study, the power table was used for sample sizes needed for the analysis of variance (ANOVA) for six group means, based on Cohen's (1988) criteria, with a level of significance (α) of .05, an effect size (γ) of .25, and a power level ($1-\beta$) of .80 was used (Portney & Watkins, 2000). According to Polit and Hungler (1999), the most widely accepted standard for the level of significance is .05. As this pilot study had not been done and the intervention was

new, a medium effect size (.25) was used (Munro, 2001). To prevent type II error, or accepting false null hypothesis, sample size must be sufficient to achieve an acceptable level of power (.80) (Burns & Grove, 2001). By using the aformentioned criteria, the minimum sample size for the study should be 32 cases per group (Munro, 2001).

In previous studies, the attrition rate of a 6-month study in stroke survivors is varying from 12.2% (Bugge, Hagen, & Alexander, 2001) to 58.5% (Hopman, & Verner, 2003). The main reasons for attrition in previous studies were death, relocating, or being loss to follow up for some other reason (Bugge et al., 2001; Burns & Grove, 2001). In Hopman and Verner's study, reasons for loss of follow-up at both discharge and 6-month follow-up included the fact that patients were not always willing to participate beyond the admission questionnaire, some patients were discharged when the volunteer was not available, and some patients did not return the survey (Hopman, & Verner, 2003). Because the study time was shorter, the anticipated attrition rate that had been used in this study was 20% (14 cases). In conclusion, the sample in this study included 84 survivors (42 cases per group).

During a one-year study period, only 58 stroke patients met the inclusion criterias, which was less than the proposed sample size. However, after all data had been collected, effect size and power levels with a sample size of 30 in experimental group and 28 in control group were calculated by using the formulas provided in Portney and Watkins (2000) and Murphy and Myors (2004) (Appendix A). The results showed that effect size of this study was .38, which was nearly a large effect size (Murphy & Myors, 2004), and a power of this study was .82, which would be

18% chance of finding non significant results, even if the null hypothesis were false (Polit & Hungler, 1999). Both effect size and power of the study were acceptable.

In addition, other factors that affect power such as type of study, measurement sensitivity and data analysis technique (Burns & Grove, 2001) were considered in decisions about sample size of this study. This study used an experimental with repeated measured design. Burns and Grove (2000) suggested that the experimental design with the greatest power is the pretest-posttest design with a randomized control group. The repeated measured design will increase power if the trait being assessed is relatively stable over time and, thus, required a smaller sample. In addition, all instruments used in this study were well-developed instruments with strong reliability and validity. Well-developed instruments tend to have smaller variance and the power of the test is increased (Burns & Grove, 2001). When considering all these factors including the limited time of the study, including the experimental design and the pilot nature of the study, the total sample size could be reduced.

The sample consisted of all patients who met the following study criteria and gave their consent. Prospective subjects who met the following criterias were invited to participate in this study.

The inclusion criteria.

1. Cognitively intact and able to communicate, as assessed by the Chula Mental Test (CMT), with a score of 14 and over (Jittapunkul, Lailert, Worakul, Srikaitkhachorn, & Ebrahim, 1996; Lerttrakarnnon, Kachaenchai, & Thanompan, Supplement 2000). This test was used to exclude dementia cases.

2. Living with family caregiver.

3. Living within 50 Km from Muang district, Chiang Mai province.

4. Can be contacted by telephone.

5. Willing to participate.

The exclusion criteria. The subject was excluded by the recruiters during the recruitment period when they were met any following criteria:

1. Having a final diagnosis of transient ischemic attact (TIA) or subdural hematoma.

2. Active psychiatric illnesses or non-responsive to treatment.

3. Having other severe underlying diseases that limit rehabilitation, such as advanced cancer, parkinsonism, heart failure, hepatic failure, or renal failure.

4. Having aphasia.

5. Having deterioration of conscious: lethargic, obtunded, or comatose.

Discontinuation Criteria.

1. Dead or could not communicate.

2. Not willing to continue the program.

3. Moving to other place with a distance greater than 50 Km. from Muang district, Chiang Mai province.

Research Setting

The recruitment in this study was done in four hospitals in Chiang Mai province, namely, Maharaj Nakorn Chiang Mai, Nakornping, Chiang Mai Neurological hospital, and McKane Rehabilitation Center. Data collection and intervention were done at the subject's home.

Maharaj Nakorn Chiang Mai hospital is a 1,800-bed university hospital. As it is a university hospital, many complicated stroke patients are referred from community hospitals to get proper care and treatment. A patient record review found that the medical neurology out patient clinic served about 25-30 cases per month, and the rehabilitation out patient clinic served an average of 50 stroke survivors per month.

Nakornping hospital is a community hospital that has both outpatient and inpatient clinics for stroke patients. The number of stroke inpatients each month is around 50 cases and the stroke outpatient is also approximately 50.

Chiang Mai Neurological hospital and McKane Rehabilitation Center are hospitals that provide special care and rehabilitation for patients with neurological problems including stroke.

All of these setting had some similarities, but also some differences. The similarities are: 1) they all have rehabilitation units so all subjects can receive in-patient rehabilitation, 2) they all have neurologists, physical therapists, occupational therapists and nurses, who are specialized in stroke care and 3) they provide general information on stroke and informal instruction on mobility and ADL . The difference in these settings is that Nakornping Hospital and McKane Rehabilitation Center have home-care services but the others do not. In general, each hospital is the gateway for stroke clients who come from different geographic areas of Chiang Mai. Therefore, selecting the prospective subjects from these four hospitals increased the likelihood of getting a good sample of stroke survivors residing in Chiang Mai.

Sampling

Four recruiters, who were registered nurses from each hospital, recruited survivors in their own hospitals. All recruiters received orientation before beginning recruitment. To ensure maximum case ascertainment, the investigator called the recruiters every two weeks. The recruitment period lasted a total of 14 months, between May 2004 and June 2005. Data collection started after receiving approval for conducting the study from the research ethical committee of faculty of nursing, Chiang Mai University. The recruitment checklist (Appendix B) was used to recruit the sample. This checklist consists of inclusion and exclusion criterias. Additionally, dementia was excluded by using the standardized screening test, Chula Mental Test (CMT). The recruiter reviewed the patients' records before interviewing them. If the stroke survivors met the criteria, the recruiter informed them about the objectives and the method of data collection and other information about the study and obtained the informed consent (Appendix C).

A total number of 436 cases were reviewed between May 2004 and June 2005, but only 61 cases met the criteria. Three hundred seventy five cases were excluded due to living farer than 50 Km. from Muang district, age less than 45 years old, and having deterioration of conscious. After exclusions, there were 61 cases recruited into the program. The subjects were randomly assigned into experimental and control groups, 31 cases were in control group, whereas 30 cases were in experimental group. Three subjects from control group dropped-out before completing the study, which make 28 cases for the control group. The reasons for non-completion were death (1 case), moving house (1 case), and worsen condition (1

case). In conclusion, the total number of subjects in this study was 58, nine from Maharaj Nakorn Chiang Mai hospital, five from Chiang Mai Neurological hospital, six from McKane Rehabilitation Center and 38 from Nakornping hospital.

Instrumentation

The instruments in this study are divided into two parts. The first part is the research instruments, which include Demographic Data Questionnaire, Orpington Prognostic Scale (OPS), Chila Mental Test (CMT), Barthel Activity of Daily Living Index (BAI), Thai Geriatric Depression Scale–short form (TGDS-SF), Modified Perceived Social Support from Family (MPSS-Fa), and Stroke Impact Scale (SIS) and the second part is the intervention description.

Research Instruments

1. *Demographic Data Questionnair*. This instrument was used to get information about age, gender, marital status, income, family condition, co-morbid disease, types and characteristics of the stroke. (Appendix D).

2. *Chula Mental Test (CMT).* This instrument was chosen to screen dementia in stroke survivors in this study because of the following reasons: 1) the validity of CMT, which had been tested by comparison with the Mini-Mental State Exam and the Abbreviated Mental Test, had the best combination of sensitivity (100%) and specificity (90%) for detection of dementia (Jitapunkul, Lailert, Worakul, Srikiatahachorn, & Ebrahim, 1996), and 2) when compared to Thai Mental State

Examination (TMSE), CMT used less time for interviewing (2.97 minutes) than TMSE (Lerttrakarnnon, Kachaenchai, & Thanompan, 2000). (Appendix E).

3. *Orpington Prognostic Scale (OPS).* This questionnaire was used to determine severity of stroke. The OPS was a modification of the Edinburgh Prognostic Score with the addition of a test for cognition. This questionnaire includes measures of motor deficits, sensory loss, balance, and cognition (Appendix F). In addition, OPS was easy to use, required less than five minutes to perform the test, required no extensive training, and had predictive ability comparable with the National Institute of Health (NIH) Stroke Scale (Lai, Duncan, & Keighley, 1998).

To be used in this study, two items on the OPS were modified: years of the First World War were changed to years of the World War Two and name of the Monarch were changed to the name of the Prime Minister of Thailand. Total score of the OPS ranges from 1.6 to 6.8, with 1.6 being the best score and 6.8 being the worst score. The severity of stroke survivors was categorized as follows: minor stroke (OPS < 3.2); moderate stroke (OPS 3.2-5.2); and major stroke (OPS> 5.2) (Kalra & Crome, 1993; Lai, Duncan, & Keighley, 1998; Studenski, Wallace, Duncan, Rymer, & Lai, 2001).

The OPS was translated into Thai by the investigator. Two bilingual experts who were unrelated to the study and had not seen the English version independently back–translated the Thai version into English. Discrepancies had been analyzed and rewording of the questions was carried out. The Thai version of the questionnaire had been pre-tested with five Thai stroke survivors to ensure clarity and accuracy and to obtain feedback for any necessary changes.

Validity and reliability of the instrument. Content validity of OPS has been assured by comparing with the NIH Stroke Scale and Barthel Index in stroke patients. The result found that OPS showed strong correlation (r^2 =0.83, and 0.89) with NIH Stroke Scale and Bathel Index, respectively (Kalra & Crome, 1993; Lai, Duncan, & Keighley, 1998). The reliability of OPS was not reported, but this scale had been used in many studies (Duncan & Lai, 1997; Duncan, Rymer, & Lai, 2001; Lai, Duncan, & Keighley, 1998; Studenski, Wallace, Duncan, Rymer, & Lai, 2001).

4. *Barthel Activity of Daily Living Index (BAI).* This instrument was used to assess the functional ability of the stroke survivors. The BAI contains 10 items that measure daily functioning, specifically the ADL and mobility. The items include feeding, moving from chair to bed and returning to chair, grooming, transferring to and from a toilet, bathing, walking on level surface, going up and down stairs, dressing, continence of bowels and bladder (Appendix G).

The stroke survivors receive a score based on whether they have received help while doing the task. The score for the items will be summed to create a total score. The higher score, the more independent the person is. Independence means that the person needs no assistance with any part of the task. Total score of BAI is 0-20, the score can be divided into four levels: 0-4 or very low score means total dependence, 5-8 or low score means severe dependence, 9-11 or intermediate score means moderately severe dependence, and 12-19 or high score means mildly severe dependence, and 20 means total independence (Jitapunkul, Kamolratanakul & Ebrahim, 1994).

Validity and reliability of the instrument. The internel consistency reliability for BAI Thai version in this study was conducted on 10 stroke survivors, the internal reliability coefficient (Cronbach's alpha) was 0.86.

5. *Thai Geriatric Depression Scale - short form (TGDS-SF).* This instrument was used to measure depression in this study. The TGDS–SF was adapted from Thai Geriatric Depression Scale (TGDS), which was developed by Train the Brain Forum Committee, Thailand. The TGDS was derived from Geriatric Depression Scale and used as a basic screening measure for depression in older adults. The reliability of the TGDS was demonstrated with an alpha of .93 (Train The Brain Forum, Thailand, 1994).

The original TGDS consists of 30 items, but because the sample may have cognitive limitation and it needs more time to assess, the shorter 15-item version (Appendix H) was used. TGDS–SF contains 15 items which are derived from TGDS (short form). The short GDS assesses domains of 1) a sad mood and pessimistic outlook, 2) mental and physical energy, 3) a positive or happy mood, 4) agitation or restlessness, and 5) social withdrawal. Each item is answered in a "Yes", or "No" format. Cut-off score is 5. Scores 0-5 means not having depression. Scores of 6 points or higher being considered as depression (Lai, Duncan, Keighley, & Johnson, 2002)

Validity and reliability of the instrument. Validity of GDS-SF was tested by comparing this form with the 30-item version of the Geriatric Depression Scale (GDS) in the group of patients who were either cognitively intact or had mild dementia. The finding suggested that the short version of the GDS was good at

differentiating between depressed and non-depressed patients with a high correlation (r=0.84) (Burke, Roccaforte, & Wengel, 1991).

The internal consistency reliability of GDS-SF that has been used with older Koreans and older Americans were 0.85 and 0.77; and split-half reliability was 0.77 and 0.73, respectively (Jang, Small, & Haley, 2001). The reliability of TGDS-SF in this study was tested with 10 stroke survivors for internal consistency. It had Cronbach alpha coefficients of 0.82.

6. *Modified Perceived Social Support from Family (MPSS-Fa) Scale*. This scale was used to measure family social support. The original Perceived Social Support from Family (PSS-Fa) Scale was developed by Procidano and Heller in 1983. This scale was intended to measure the individual's belief that his/her needs for support, information, and feedback will be fulfilled by the family. The PSS-Fa Scale is a 20-item questionnaire with items answered in a "Yes", "No", or "Don't know" format.

Xiaoying (1999) modified the original PSS-Fa Scale and translated it into the Chinese language. The "Don't know" option was eliminated to prevent a bias of choosing this answer. For each item, the "Yes" answer will be scored as 1; the "No" answer will be scored as 0. The total score range of the scale is from 0-20. Score 0-6 means low perceived family social support. Scores of 7-13 are moderate perceived family social support and score 14-20 are high perceived family social support (Xiaoying, 1999).

In this study, the English version of MPSS-Fa Scale (Appendix I) was translated into Thai language by the investigator. Two bilingual experts who were unrelated to the study and had not seen the English version independently back–

translated the Thai version into English. Discrepancies were analyzed and rewording of the questions was carried out. The Thai version of the questionnaire had been pre-tested with five Thai stroke survivors to ensure clarity and accuracy and to obtain feedback for any necessary change.

Validity and reliability of the instrument. The test-retest reliability of the original PSS-Fa Scale over a one-month interval was 0.83. The internal consistency with a Cronbach alpha was 0.90 (Procidano & Heller, 1983). The reliability of the MPSS-Fa Scale in Chinese version is .91 (Xiaoying, 1999). Reliability of the MPSS-Fa Scale Thai version in this study was tested with 10 stroke survivors for their internal consistency. The Cronbach alpha coefficients obtained was 0.92.

7**.** *Stroke Impact Scale (SIS) version 3.0.* This instrument was a stroke specific quality of life measure, which was developed by Duncan and colleagues (2001). It is derived from the SIS version 2.0 that consists of 64 items (Duncan, et al, 1999). The SIS version 3.0 is a 59-item instrument that measures eight domains: strength, hand function, mobility, activity of daily living, emotion, memory, communication, and social participation (Appendix J). Each item is rated on a scale 1- 5; each domain score has a range of 0-100. The SIS also includes a question to assess the stroke survivor's global perception of percentage of recovery on a visual analog scale of 0-100, with 0 means no recovery and 100 means full recovery (Duncan, et al, 1999).

In this study, the linguistic validation process of this questionnaire followed the Mapi Research Institute guideline. Two Thai translators translated the original English version of SIS version 3.0 into Thai language and the translation was reconciled by the researcher and translators. Two bilingual experts who were

unrelated to the study and had not seen the English version independently back–translatd the Thai version into English. After discussion with the back translators, the researcher compared the back translation version with the original version. Discrepancies were analyzed and rewording of the questions were carried out. The Thai version of the questionnaires was pre-tested with five Thai stroke survivors to ensure clarity and accuracy and to obtain feedback for any necessary change.

Validity and reliability of the instrument. The development of the SIS is an ongoing process. The reliability, validity, and sensitivity of SIS version 3.0 have not been published. For SIS version 2.0, the interclass correlation coefficients for test-retest reliability of SIS domains ranged from 0.70 to 0.92, except for the emotion domain (0.57) (Duncan, et al, 1999).

In this study, reliability of the overall SIS Thai version had been tested with 10 stroke survivors and established by Cronbach alpha coefficiency for their internal consistency. It had Cronbach alpha coefficient of 0.91. The internal consistency of SIS sub-domains Thai version ranged from 0.63 to 0.92, except for the hand function domain that the reliability coefficient was 0.35.

Intervention Description

A home-based nursing intervention program for enhacing QOL of stroke survivors. To increase functional ability, perceived social support from family and QOL, as well as to reduce depression of the stroke survivor, a home-based nursing intervention program was provided to the experimental group. The aim of this program was to enhance QOL of stroke survivors by providing health education,

encouraging and helping the survivors and their family caregivers manage their own health problems and providing them with the skills to manage their life post-stroke.

The components of the home-based nursing intervention program included teaching using audiovisual aids; skill training in ADL and exercise including moving and physical activities; supporting and counseling. The educational materials in the program consist of 9 booklets and 13 pamphlets which were developed by the investigator (Appendix K). The contents in booklets and pamphlets derived from reviewed literatures, the National Stroke Association, the American Stroke Association and the American Heart Association handbooks and pamphlets that contained all issues in the protocols.

The program consisted of eighteen nursing intervention protocols (Appendix L), which were divided into two groups. The first group consisted of eight general information protocols for every stroke survivor, including knowledge about stroke, stress management, activities of daily living, home safety/home modification, mobility/positioning, exercise/physical activity, medication, and social support. Another group consisted of ten specific issues as following: depression, incontinence, hypertension, diabetes mellitus, hypercholesterolemia, inappropriate used of complementary therapy, unilateral neglect, dysphagia/aspiration, pressure sore, and communication problems. All subjects in the experimental group received all protocols in the first group, while some subjects were selected to receive some protocols in the latter group, according to their problems. In order to cover the stroke related outcomes, based on the ICDH model (Duncan et al., 2001), all contents in the protocols were grouped under impairments, disabilities, and handicaps.

Intervention procedure. After the subjects were randomly assigned into experimental and control groups, the investigator gave two booklets, a self-care guideline for the stroke survivor and a guideline for the caregiver of the stroke survivor, to all subjects in both groups. The self-care guideline for stroke survivors consisted of the overall information about stroke. The caregiver guideline contained helpful information for stroke family caregivers, which included changes in stroke survivors and how to care for stroke survivors. The 3-month home-based nursing intervention was provided to the experimental group by the investigator, whereas the control group did not receive the intervention.

Nursing intervention for the experiment group. In the experimental group, the stroke survivor was called within 1-7 days after the enrollment and signing a consent form, to arrange the first visit and baseline assessment. The investigator carried out home visits to implement the intervention every two weeks for three months. The total number of home visits was six. The exact length of the home visit depended on the available time of stroke survivor and caregiver. The interventions provided during home visit were as following:

1. At the first visit after the baseline assessment, 15 minutes were spent establishing a relationship between the investigator and stroke survivor and family caregiver and describing the role of an investigator and stroke survivor. Initial assessment using "initial assessment tool" (Appendix M) was done to find out the problems that related to the protocols. This information gave a general picture of which problems should be focused on. The assessment tool took, on average, five minutes to complete. Twenty minutes were spent in discussing all problems and concerns with the stroke survivors and their family caregivers following the Problems

and Care Plans Record (Appendix N). The last twenty minutes was used for discussing and providing care in the first protocol to stroke survivor and caregiver. A telephone number of the investigator was given to the stroke survivor and caregiver in case they needed some advice or guidance.

2. At the 2^{nd} – 6^{th} visits, all activities were completed but with different sequences. All content in the first group of protocols were provided to the stroke survivor and family caregiver. Content in the second group of protocols were added if the problem was found. The strategies used in each protocol were based on the content of the protocol.

The first 15 minutes in each visit began with a review of problems in the previous visit and the progression followed by an intervention as needed. The next 30 to 45 minutes were set up for providing intervention follow the protocols. The educational materials and visual aids were used in order to clarify the problem and intervention. The last 10 minutes was used to summerize the intervention and plan for the next visit.

Before finishing the program, all stroke survivors in the experimental group received eight protocols in the first group of the activities that contained general information necessary for stroke survivors. They also received some second group protocols based on the problems they were encountering.

Nursing intervention for the control group. In control group, stroke survivor was contacted at home after the informed consent was signed to arrange the baseline assessment. After the baseline assessment, the stroke survivor and caregiver were advised to consult the health care personel at the health station or the nearest hospital.

After week-6 and week-12 of the enrollment, the follow up assessment was done (Figure 3).

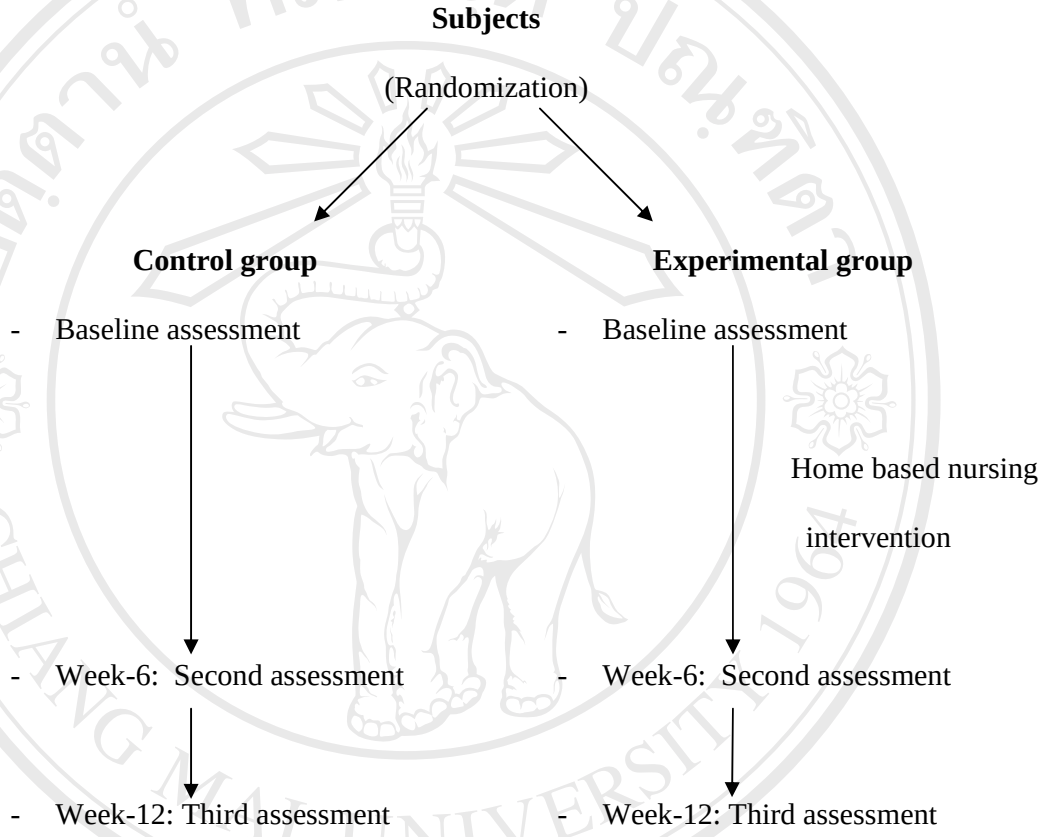

Figure 3. Plan for nursing intervention program

Human Rights Protection

Ethical approval was granted from the research ethical commitee of faculty of nursing, Chiang Mai University, Thailand (Appendix O). The subjects were informed in the cover letter of human subject protections. The introductory cover letter (Appendix P) explained the purpose of the study, confidentiality, potential risks,

rights of the subjects, and benefits of participation. A consent form indicated willingness to participate in the study and informed subjects of their rights to withdraw at any time. Both stroke survivor and caregiver signed the consent before starting the assessment.

Data Collection

Within one week after receiving informed consent, the nurse research assistant collected the personal and stroke-related data from medical record and interviewed of the stroke survivor by using Demographic Data Questionnaire. All personal data were confirmed with the family caregivers. Baseline demographic data including age, gender, marital status, income, number of family caregivers and relationship with stroke survivors, co-morbid diseases, stroke types and severity, were collected by using the same Demographic Data Questionnaire.

Baseline data of functional ability, depression, perceived social support from family, and QOL were also collected by using BAI, TGDS-SF, MPSS-Fa, and SIS, respectively. A registered nurse who was trained to use all research instruments by the investigator carried out a baseline interview within one week after the patient was discharged from the hospital. Within one week after week-6 and week-12 of the intervention, the second and third follow-up assessments were re-administered at the survivor's home.

Data Analysis

The statistical analysis was performed. Characteristics of the study subjects were described by mean and standard deviation for continuous variables and by frequency and percentage for categorical variables. T-test for two independent samples was used to test the difference in mean scores of age between intervention and control groups. Chi-square test was used to test for differences between the intervention and control groups on categorical variables that contained more than two sub-categories, whereas Fisher's exact test was used to test two sub-categories variables. The data analysis plan for each specific objective is presented as follow:

Stroke Impact Scale (SIS) score was used to determine the difference in QOL of stroke survivors before and after receiving a home-based nursing intervention program. The functional ability of the stroke survivor was determined by BAI score. Depression was determined by TGDS-SF scores, while perceived social support from family was determined by MPSS-Fa score. Means and standard deviations were used to describe total and sub-dimentions scores on the SIS, BAI, TGDS-SF, and MPSS-Fa scores in both control and experimental groups at baseline, week-6 and week-12 after the intervention.

Repeated measured analysis of variance (ANOVA) was used to compare the difference in SIS score between and within the experimental and control groups at baseline, week-6, and week-12. Before repeated measure ANOVA was used, the assumptions for t-test and ANOVA and the homogeneity of variance were tested. The testing results showed that SIS scores in both groups were normally distributed, the

homogeneteity of variance in both group were not different, and the stroke survivors were randomly assigned to each group (Munro, 2001).

The results from Levene test also presented the equal variences in BAI, TGDS-SF, and MPSS-Fa scores in both groups. When testing the distribution of BAI, TGDS-SF, and MPSS-Fa scores of both groups at baseline by using Kolomogorov-Smirnov test, it was found that BAI score of both groups, TGDS-SF in the experimental group, and MPSS-Fa scores in control group were not in normal distribution. Therefore, the repeated measure ANOVA could not be used.

In order to compare the difference in BAI, TGDS-SF, and MPSS-Fa scores between the experimental and control groups, within the control group, and within the experimental group in relation to each time of measurement, nonparametric tests were used. According to Munro (2001), with nonparametric tests, there is no assumption about the distribution of the variable. Friedman matched samples which is analogous to a repeated measures ANOVA was used and Post Hoc comparison for the Friedman test was calculated in order to compare the difference in BAI, TGDS-SF, and MPSS-Fa score between experimental and control groups at each point of measurement.