CHAPTER 3

METHODOLOGY

This chapter presents a description of the research design, population and sample, research setting, research instrument, human rights protection, training of interviewers, data collection procedure, and data analysis.

Research Design

This cross-sectional descriptive research study aimed to examine the prevalence of HAART adherence among HIV infected children receiving treatment at Maharaj Nakorn Chiang Mai hospital, to study the caregivers' knowledge and understanding regarding HAART and HIV and to explore other factors of adherence in children with human immunodeficiency virus (HIV) as reported by caregivers.

Population and Sample

Population

The target population for this study consisted of caregivers of HIV infected children under the age of 14 years, who received treatment at the pediatric infectious disease clinic at Maharaj Nakorn Chiang Mai hospital.

Sample

The sample for this study included the caregivers who met the following inclusion criteria and were willing to participate in the study.

Inclusion Criteria:

1. Caregiver of a child under the age of 14 years and infected with the human immunodeficiency virus (age 14 was chosen as children older than this generally administer their own medication)

2. Children received treatment at the pediatric infectious disease clinic, Maharaj Nakorn Chiang Mai hospital

3. The child's primary caregiver

4. Caregiver willing to participate in the study

5. Caregiver and their child mentally and emotionally stable at the time of study

Convenient sampling was used as the method of selection whereby the caregivers volunteered to participate in the study.

Sample Size

To determine the sample size for the study the researcher used the following formula:

- The proportion of adherence from a previous study was used (Boni et al., 2000) = 44% (p) and aimed to achieve 95% CI (confidence interval).

Given z value = 1.96, and m = 0.10

$$n \geq \left(\frac{z}{m}\right)^2 \times \widehat{p}(1 - \widehat{p})$$

Sample size = $\left[\dfrac{1.96}{0.10}\right]^2$ X 0.44 (1 – 0.44) = 94.6

≈ 95

n = 95

- The proportion of adherence from a previous study was used (Feingold et al., 2000) = 54% (p) and aimed to achieve 95% CI (confidence interval).

Given z value = 1.96, and m = 0.10

$$n \geq \left(\frac{z}{m}\right)^2 \times \widehat{p}(1 - \widehat{p})$$

Sample size = $\left[\dfrac{1.96}{0.10}\right]^2$ X 0.54 (1 – 0.54) = 95.43

≈ 95

n = 95

- The proportion of adherence from a previous study was used (Golin et al., 2002) = 71% (p) and aimed to achieve 95% CI (confidence interval).

Given z value = 1.96, and m = 0.10

$$n \geq \left(\frac{z}{m}\right)^2 \times \widehat{p}(1 - \widehat{p})$$

Sample size= $\left[\dfrac{1.96}{0.10}\right]^2$ X 0.71 (1 – 0.71) =

≈ 79

n = 79

Prevalence (Ref)	*m*	Sample size
44% - (Boni et al., 2000)	0.10	95
54% - (Feingold et al., 2000)	0.10	95
71% - (Golin et al., 2002)	0.10	79
44% - (Boni et al., 2000)	0.20	24
54% - (Feingold et al., 2000)	0.20	24
71% - (Golin et al., 2002)	0.20	20

Thus the proposed sample size for this study was 95, however the final sample included 74 participants. The proposed sample size was not met due to the time period of the study was for 3 months. The sample included the caregivers of children under 14 years who received treatment at Maharaj Nakorn Chiang Mai hospital and volunteered to participate in the study. The researcher submitted a request to reduce sample size to the Graduate School, Chiang Mai University.

Research Setting

This study was conducted and participants recruited at the pediatric infectious disease clinic at Maharaj Nakorn Chiang Mai hospital. The participants were informed of the purpose and method of the study during their monthly clinic visit and asked to volunteer to participate. Eligible caregivers received a follow up telephone call to remind them about the study. After the caregivers agreed to participate they completed the informed consent form at their next monthly clinic appointment and verbally answered the study questionnaire, during March to June 08. In addition caregivers who did not participate in the pilot studies and subsequent data collection period at their monthly clinic appointment were invited to attend a data collection day on May 1st 2008. This day is a national holiday in Thailand and it was hoped that more caregivers would attend for the research assistants to collect data for the study.

Research Instruments

Poppa and colleagues (2004) highlight that a lack of a standard approach to measuring adherence and the lack of an agreement of what constitutes a clinically effective level of adherence are important challenges for the field. They also stated that while trials may assess adherence by presenting a measure of the number of doses missed, few include an assessment of whether the doses were taken on time or with proper regard to dietary restrictions.

The instruments used for data collection included a five part interviewer (research assistant) administered questionnaire and a data extraction form including the child's demographic data and medical information.

Five part questionnaire: This interviewer (research assistant) administered questionnaire was read to the caregivers in order that they would be clear about the questions being asked and that all questions were answered. In addition, some caregivers were unable to read or write Thai, the research assistants read the questions verbatim and wrote down all information given to them by the caregivers. The questionnaire was divided into five parts: part 1, demographic data of primary caregiver; part 2, medication information; part 3, knowledge and understanding; part 4, attitudes and self efficacy and; part 5, clinical setting and support.

Part 1 of the questionnaire was developed by the researcher based on a literature review and was used to gather the caregiver's demographic data that included gender, age, relationship to child, nationality, religion, marital status, education level, employment status, household numbers, household monthly income, HIV status, general health, and length of time as caregiver. Part 2 to part 5 of the questionnaire was developed by the researcher using a modified version of the Treatment Interview Protocol (TIP) by Marhefka et al., 2004 and the Pediatric Adherence Questionnaires by the Pediatric AIDS Clinical Trials Group (PACTG, 2004). Part 2 to part 5 of the questionnaire consisted of; medication information (11 questions), knowledge and understanding (9 questions), attitudes and self-efficacy (10 questions), and clinical setting and support (10 questions). The medication information part consisted of 11 questions, which included a medication identification table, missed doses to measure adherence, an aids/tools utilization table, with 'yes' 'no' answers, a table of 28 problems/difficulties encountered, and general medication questions with yes, no, don't know. The second part included 9 knowledge and understanding questions, measuring correct responses to general HIV questions. The

third part identified caregiver's attitudes and self-efficacy with 10 statements of strongly agree, agree and strongly disagree, disagree. The final part incorporated 10 statements on clinical setting and support, the caregiver answered strongly agree, agree and strongly disagree, disagree (Appendix C).

Data extraction form: This form was completed by staff at the infectious disease clinic based on the child's medical records and included demographic data of the child, medication information e.g. last CD4 count and viral load, and length of time on HAART. This form also included information on the child's medication (name, pills each dose, doses per day, special instructions) in order to compare the details to the answers given by the caregivers (Appendix E).

The back-translation technique was used to ensure the accuracy of the translation in both the questionnaire and the data extraction form. The first step was forward-translation of the researcher modified questionnaire into Thai language by a bilingual expert to assess the suitability of the wording and to ensure questions were culturally specific. The second step was back-translation of the Thai version into English version by a second bilingual expert. The researcher then compared the back translation version with the original version to check for any discrepancies.

Reliability; the questionnaire was tested for objectivity by conducting pilot studies over a one month period on the sample population. The first version of the questionnaire was administered to 5 caregivers and the research assistants reported back the suitability and feasibility of the tool. The questionnaire was adapted and modified with assistance from the advisors after feedback from the research assistants. The instrument was then tested again with another 5 caregivers, modified and adapted based on feedback from the research assistants. This pilot study of checking,

modifying and testing continued with a total of 20 caregivers and the final tool was read by three experts who agreed on the final version.

Measurements:

      1. Prevalence of adherence was measured using 4 markers: 1) caregiver recorded missed doses from part 2 of the questionnaire, 2) pill count, 3) last CD_4 count, and 4) viral load. Last CD_4 count and viral load were extracted from patient records using the data extraction form.

      2. Caregivers' knowledge and understanding were measured in part 3 of the questionnaire.

      3. Other factors of adherence were extracted from all parts of the questionnaire and categorized into 4 groups namely; patient/caregiver factors, clinical setting, treatment regimen, and patient-provider relationship (Ickovics & Meade, 2002).

<div align="center">Training of Research Assistants</div>

      For this study it was necessary for the researcher and an advisor from the Faculty of Medicine, Chiang Mai University to train research assistants to conduct the data collection, the researcher was unable to collect her own data due to the inability to communicate fully in the Thai language. Some researchers consider it ideal that the interviewer/data collector should not be a health care provider (Turner & Hecht, 2001), with this in mind the researcher recruited six research assistants who had assisted with previous research projects at the research setting but were not health care providers. The six research assistants were all students at the local teaching

college in Chiang Mai and had no in-depth knowledge of the research topic so they could not 'guide' the caregivers in their answers.

The research assistants undertook a half day training session which consisted of a formal discussion about the study aims and objectives, the sensitivity of the research topic and how to correctly administer the questionnaire. The training was also aimed at building a team that would conduct its self ethically and professionally during data collection. The research assistants were involved in the process beginning with the pilot testing phase of the study instruments. Working on the pilot testing phase enabled the research assistants to become familiar with the research approach prior to the main study, to become familiar with the questionnaire and to ensure they understood each question correctly.

<div align="center">Human Rights Protection</div>

This study was approved by the Research Ethics Committee/Institutional Review Board (IRB), at the Faculty of Medicine, Chiang Mai University, Thailand (see Appendix B). All participants were notified about the study purpose and the methods of the study. They were also informed that they had the right to refuse, to stop or discontinue the study at anytime. Participants were assured that they would not be penalized or lose any benefits. Furthermore, participants' names were not used, alphabetical and numerical codes on all documents strictly protected the anonymity and confidentiality of the participants. In addition, participants were compensated for their time and all travel costs were covered. Participants who agreed to be involved in the study signed the informed consent form (Appendix A) prior to commencement of the questionnaire.

Data Collection and Analysis

Data were collected from caregivers of HIV infected children receiving treatment at the pediatric infectious disease clinic, Maharaj Nakorn Chiang Mai hospital, Chiang Mai, Thailand during March to June 2008. For this descriptive study, data collection using the questionnaire was undertaken by research assistants trained by the researcher and an advisor from the Faculty of Medicine, Chiang Mai University. The data extraction form was completed by staff at the pediatric infectious disease clinic, Maharaj Nakorn Chiang Mai hospital based on the children's medical records throughout the study.

The children's adherence to HAART was measured using 4 markers namely:

1. Caregiver recorded missed doses from part 2 of the questionnaire: children were be classified as adherent if the caregiver reported that they missed less than 3 doses within the last 30 days previous to the research study (successful HIV therapy requires adherence of $\geq$ 95%, UNICEF 2005).

2. Pill count: children were classified as adherent if they had correct pill count as recorded by the staff at the infectious disease clinic.

3. Last measured CD$_4$ count: children were classified as adherent if they had a CD$_4$ count in the normal range $\geq$ 15% (measured within 3 months of the study).

4. Last measured viral load: children were classified as adherent if they had a viral load of equal to or less than 400 copies/ml (measured within 3 months of the study).

Last CD$_4$ count and viral load were extracted from patient records using the data extraction form.

These methods of data collection were used because evidence of drug resistance, increasing viral load and decreasing CD$_4$ count are commonly considered signs of nonadherence, but they are not well represented as assessment strategies in research studies of pediatric HAART adherence (Simoni, Montgomery, Martin, New, Demas, & Rana, 2007). Moreover, Marhefka and colleagues (2004) suggested that regimen knowledge assessment and pill count may be the best methods available for adherence assessment within the clinical setting. With this in mind data collection on caregivers' knowledge and understanding were conducted in part 3 and factors related to adherence were extracted from all parts of the questionnaire, data analysis includes descriptive statistics using Ickovics & Meade's Determinants of Adherence to HAART Model (2002) as a guideline.