CHAPTER IV

STUDY POPULATION

Target Population

The target population refers to all nursing personnel who were working in all 5 intensive care units at Maharaj Nakorn Chiang Mai Hospital, Chiang Mai.

Study Sample

Nursing personnel who were working in all 5 intensive care units of Maharaj Nakorn Chiang Mai Hospital during March 19, 1991 - December 20, 1991 and fulfilling the eligibility criteria were recruited for the study. These personnel included male/female nurses and practical nurses.

Eligibility Criteria

These eligibility criteria were:

1. Inclusion Criteria: all nursing personnel who were working in the intensive care units and providing any type of mechanical ventilator care for patients.

2. Exclusion Criteria: any nurses or practical nurses of the intensive care units who took a leave for any reason; such as continuing education, vacation, etc. during a period of study.

The patients who were admitted to the intensive care units of Maharaj Nakorn Chiang Mai Hospital and required mechanical ventilation at anytime during the study period were the units of study.

Sample Size Calculation

In order to avoid having study sample of inadequate size, all three factors which affected the sample size calculation, i.e. variance, confidence interval and clinical acceptable error, were taken into consideration:

Variance. Variance is a measurement of dispersion. It is the square of standard deviation. If the variance is high, many subjects or higher number of observation will be needed. In this calculation of sample size, the variance was estimated from a previous study (Vannarit, 1983) by using the following formula (Kiess, 1983):

$$SD = \frac{\sum (X_1 - X)^2}{N - 1}$$

$$= 0.20$$

Confidence Interval. The confidence intervals reflect how much error the researcher is prepared to accept in drawing a wrong conclusion about the research result; two levels of confidence interval are commonly used: 95% and 99%. For this study a confidence interval of 95% was used. This indicated that we prepared to accept only five percent chance of drawing a wrong conclusion about the results.

Clinical Acceptable Error. The clinical acceptable error signifies the magnitude of deviation from the mean estimate that is considered clinically important. If the acceptable clinical error are larged, we would need a smaller sample size. This acceptable deviation from the mean estimate is a clinical property and not a statistical property. Two numbers that are usually used are: 10% and 20%. We chose the clinical acceptable error of 10% as smaller clinical acceptable error which meant that the study would be more sensitive.

In this descriptive study which required a single group of subjects, the following formula for the estimation of a sample of observation, N, was employed (Sitthi-Amorn, 1987):

$$N = Zx^2 \times SD^2 / \Delta^2$$

Where Zx = the confidence intervals and was equal to 1.96 for 95% confidence levels,

SD = represents the variance for this measurement data = 0.20,

Δ = clinical acceptable error = 10%.

So, $$N = \frac{1.96 \times 1.96 \times 0.20 \times 0.20}{0.10 \times 0.10} = 15.67.$$

Thus, sixteen observations were needed for each procedure with the 95% confidence limit and the clinical acceptable error of 10%.