

CHAPTER 3

Methodology

This chapter describes the methodology of the study that consists of descriptions of research design, setting, population, instrument, sample, data collection procedures, and data analysis, and protection of research subjects.

Research Design

This study was a methodological study aimed to develop a scale for assessing competency of head nurses in community hospitals in Thailand. The process of instrument development is comprised of five steps: 1) determining the construct of the measure, 2) generating an item pool, 3) determining the format for measurement, 4) having the initial item pool reviewed by experts and pretesting the initial instrument, and 5) administering items to a development sample and evaluating the items.

Research Setting

The study was conducted in a clinical setting, at 30-to 90-bed community hospitals in Thailand for pre-testing, field-testing, and contrasted group testing. In field-testing and contrasted group testing, there are 12 health regions in Thailand where four health regions were randomly selected: the first, the second, the third, and the fifth health regions consisting of 165 community hospitals. In pre-testing, there were eight health regions where were not selected in field-testing and contrasted group testing. Then, one health region was randomly selected: the fourth health region, and after that eight community hospitals were randomly selected.

Population

The target population in this study consisted of four groups: nurse educators, nurse administrators known as a director of nursing service, and a head nurse and staff nurses. The available population was directors of nursing service, head nurses, and staff nurses who work in the 30- to 90-bed community hospitals, and nurse educators who work in the faculties of nursing, and Thailand Nursing and Midwifery Council.

Inclusion criteria. In pretesting and field-testing, head nurses of each community hospital were selected in units including inpatient, outpatient, emergency, and labor units.

Instrument, Sample, Data Collection Procedures and Data Analysis

This part was described according to the five steps, which follow the process of development as:

Step 1: Determining the construct of the measure.

The conceptual definition of the essential competency for head nurses in community hospitals was based on the head nurse competency framework developed by the Thailand Nursing and Midwifery Council (2013), the reviewed literature, and the data received from qualitative approach with semi-structured individual interviews and focus group discussion.

The Interview Guide was used to interview the directors of nursing service and head nurses and consisted of open-ended questions asking them to describe and identify the essential competencies for head nurses in community hospitals, and defined behaviors of each competency. The Focus Group Discussion Guideline had the same questionnaires as the Interview Guide used to interview the directors of nursing service and head nurses. This Interview Guide was developed by the researcher and reviewed for content validity by three nurse experts from the Faculty of Nursing, Chiang Mai University. The data from these groups were used for determine the construct of the measure.

Sample. Four directors of nursing service who worked in the 30- to 90-bed community hospitals, and had experience in a head nurse position in 30- to 90-bed community hospitals were recruited by purposive sampling. One of them was recruited for focus group discussion. Three directors of nursing service were interviewed.

Six experienced head nurses who worked in the 30- to 90-bed community hospitals were recruited by purposive sampling. One of them was interviewed, and five were recruited for focus group discussion.

Data collection procedures. The data collection was done by this researcher step by step as follows:

1. After ethical approval from the Research Ethic Review Committee of the Faculty of Nursing Chiang Mai University, the researcher contacted the directors of nursing service of each hospital for the permission to collect data.

2. After receiving permission, the researcher individually contacted the four directors of nursing service and six head nurses for the interview appointment.

3. The directors of nursing service and head nurses were asked for permission to record an audiotape before the interview and focus group discussion. The records were destroyed immediately after finishing the study.

4. The researcher individually interviewed each of the directors of nursing service and head nurses including three directors of nursing service and one head nurse using the Interview Guide. The individual interview was carried on until the data were comprehensive. Each interview took one to one and a half hours.

5. The researcher carried out the focus group discussion with one director of nursing service and five head nurses working in community hospitals. The focus group discussion was conducted two times. Notes were also taken by the research assistants who were trained through explanation about the purposes of this study, and the methods of the observation and records. Each focus group's discussion took approximately fifty to ninety minutes.

6. Data were analyzed the content using content analysis, and taken to clarify a concept and identify operational definitions of terms which were reviewed by the researcher, the dissertation advisory committee, and the directors of nursing service and head nurses of individual interview and focus group discussion. Then, the

researcher specified variables and dimensions of a conceptual model of competency of a head nurse in the 30-to 90-bed community hospitals.

Data analysis. Descriptive statistics were used to describe the demographic data of participants including frequencies, percentages, means, range and standard deviations.

Qualitative data were analyzed using content analysis. The audiotape from individual interviews and focus group discussion was transcribed using a word processor after the interviewing process. The items classification was done based on the framework of competency for head nurses by TNC (2013), literature reviews, individual interviews, and focus group discussion. The researcher repeatedly read the transcriptions, and categorized the data from the frequency, order, or intensity of the occurrence of words, phrases, or sentences. Then, the items with a high frequency were selected to be combined in each component of competency scale, and established in the item pool. The data was validated by the dissertation advisers and 6 experts. These items became the first draft of a CASHNCH.

Step 2: Generating an item pool.

Data regarding dimension of competencies of a head nurse in the 30-to 90-bed community hospital obtained from step 1 was used for developing items. The initial draft of a Competency Assessment Scale for Head Nurses in Community Hospitals [CASHNCH] was constructed of five domains with 125 items. This item pool was reviewed by the dissertation advisory committee before it was reviewed by the panel of experts.

Step 3: Determining the format for measurement.

A Competency Assessment Scale for Head Nurse in community hospitals is composed of two parts: the demographic data form, and the competency assessment scale. After the item pool generation, scaling responses were defined with a five point Likert-type scale ranging from: 1 = hardly ever done or never done (0-20.00% of practice), 2 = seldom done (20.01-40.00% of practice), 3 = occasionally done (40.01-60.00% of practice), 4 = almost always done (60.01-80.00% of practice), 5 = always done (80.01-100% of practice).

Step 4: Having the initial item pool reviewed by experts and pretesting the initial instrument.

Reviewing the initial item pool. The developed items were reviewed for content validity of the initial draft of a CASHNCH by six educator experts. The package reviewed by the experts included the initial draft of a CASHNCH, and the content evaluation form for experts consisting of a four-point rating scale: 1= not relevant, 2= somewhat relevant, 3= quite relevant, and 4= very relevant.

The six content experts were recruited by purposive sampling that consisted of four nurse educators who were knowledgeable in the area of competency for head nurses in community hospitals, one nurse educator was knowledgeable in scale development, and one nurse educator had experience as a head nurse and the director of nursing service, and worked in the 30- to 90-bed community hospital.

Data collection procedure.

1. The researcher individually contacted the six experts. Then, the draft of a CASHNCH and a content validity evaluated form were sent to each of them.

2. The experts were asked to independently rate the relevance of each item to the construct, and appropriately measure all dimensions of the construct. In addition, experts were asked to evaluate the items' clarity, conciseness and the scale format, identify any awkward or ambiguous items, and suggest or comment for item revisions. After two rounds of the experts reviewed, a CASHNCH was revised according to the comments from the experts, and then the second draft of the instrument with 55 items was constructed.

3. Then, the researcher used statistical techniques to test the content validity of the scale.

Data analysis. The items of scale were computed by I-CVI and S-CVI. Item content validity index (I-CVI) was calculated as the proportion of items given a rating of 3 or 4. Scale content validity index (S-CVI) is the average of the I-CVI for all items on the scale. For six experts' rating the relevance of each item, the accepted value of I-CVI should be at least .78 (Lynn, 1986), and the value of S-CVI/Ave should be at least .90 (Polit & Beck, 2008). If items did not reach the minimum agreement, they were revised or deleted.

Pretesting the initial instrument. The instrument in this step was the revised draft of a CASHNCH before it was tested in field testing.

Sample. The participants recruited were 32 head nurses in the 30- to 90-bed community hospitals resembling the samples in the field-testing using a multistage sampling procedure. In this study, head nurses of each community hospital were recruited in units consisting of inpatient, outpatient, emergency, and labor units. The fourth health region was one of eight health regions in Thailand selected randomly, and they were not four health regions in the field-testing. Then, eight community hospitals were selected by simple random sampling from all the community hospitals in the fourth health region.

Data collection procedure.

1. The researcher contacted the directors of nursing service of the hospitals for the permission.

2. A CASHNCH, the Demographic Data Form and the Informed Consent Form were mailed to the directors of nursing service of eight community hospitals in the fourth health region after receiving permission from the directors of nursing service. Then, these documents were distributed to 32 head nurses in each community hospital, who worked in inpatient, outpatient, emergency, and labor units. The participants were asked to assess their competencies and rated in the scale. Besides, they were asked to evaluate readability of the constructed questionnaires and length of the overall scale.

3. After two weeks, the participants sent the scales back to the researcher. The response rates of the total scales were in 93.75 percent. The scale was completed by 30 head nurses.

4. After the documents were returned, the researcher revised the instruments according to the comments and suggestions, and created the third draft of the instruments. Then, the researcher tested for the clarity, readability and reliability of scale.

Data analysis. Descriptive statistics were used to describe the demographic data of participants including frequencies, percentages, means, range and standard deviations.

The internal consistency reliability was used to consider the reliability of the scale in each domain. Cronbach's alpha coefficient was used to assess the internal consistency reliability of the scale and of each domain. A scale reliability coefficient above .70 was considered acceptable (DeVellis, 2003; Hair et al., 2006; Knapp & Brown, 1995).

Step 5: Administering items to a development sample and evaluate the items.

Field-testing, or administering the measure. The final draft of 55 items a CASHNCH was evaluated for the psychometric properties.

Sample. The 660 head nurses added up to be the expected attrition rate of 20 percent were recruited in this study (Polit & Beck, 2008). The sample size was computed by 10 participants per item (Hair et al., 2006; Nunnally, 1978). Four health regions were selected randomly from twelve regions within Thailand. All head nurses in four health regions were administered for field-testing.

Data collection procedure.

1. The researcher contacted the directors of nursing service of the hospitals.
2. After receiving permission from the directors of nursing service, the researcher mailed a CASHNCH, the Demographic Data Form, and the Informed Consent Form to nurse executive in 165 community hospitals of four health regions. Then, these documents were distributed to four head nurses in each hospital working in inpatient, outpatient, emergency, and labor units. The documents were completed by the participants.
3. Six hundred and forty participants returned the scales, resulting in a 96.97 percent response rate. The 26 responses (3.94 percent) that were incomplete data, were excluded, so the 614 scales (93.03 percent) were completed.
4. After the documents were returned, the researcher analyzed data item analysis, internal consistency reliability and construct validity based on the objectives of the study.

Data analysis. Descriptive statistics were used to describe demographic data of the participants including frequencies, percentages, means, range, and standard deviations.

The analysis of the psychometric properties of the scale included discrimination power of items, item analysis, internal consistency reliability, exploratory factor analysis, and comparison of mean scores, which are described as follows:

Discrimination power of items. If the item has good discrimination, it indicates a very narrow ambiguous area. On the other hand, a less discriminating item has a larger region of ambiguity (DeVellis, 2003). An independent t-test was applied to analyze the comparison of mean scores between the high score group and the low score group. The level of significance was less than .05.

Item analysis. Inter-item correlation, corrected item-total correlation, item-subscale correlation, subscale-subscale correlation, and subscale-total correlation were examined using Pearson product-moment correlation. The criterion for selecting qualified items to constitute a consistent scale included a corrected item-total correlation and a corrected item-subscale correlation of .30 or higher (Nunnally, 1978); inter-item correlations ranged from .30 to .70 (Ferketich, 1991; Mishel, 1998).

Internal consistency reliability. The internal consistency and reliability was analyzed by Cronbach's alpha coefficient. This study is a new scale, so, reliability coefficient above .70 is considered acceptable (DeVellis, 2003; Hair et al., 2006; Knapp & Brown, 1995).

Exploratory factor analysis. Construct validation and selected item were estimated by exploratory factor analysis with maximum likelihood and principal components method, using orthogonal rotation method with varimax and oblique rotation with oblimin. Factor analysis for the data was supported when the measure of sampling adequacy was .50 or above, and the Bartlett's test of sphericity was statistically significant ($\text{sig} < .05$) (Hair et al., 2006). The criteria for determining factor solution included: 1) the variables had communalities of greater than .50 to be retained in the analysis 2) percentage of variance was enough factors explains 60 percent or higher of total variance 3) the eigenvalues was a cut-off point greater than

1.00 or above, 4) the scree plot was shown, and weights or a factor loading was a single or few variables related the cluster of variables with the minimal acceptable cut-off point being .30 (Hair et al., 2006).

Testing of constructed validity using contrast group approach. The Competency Assessment Scale for Head Nurse in Community Hospitals was tested by the contrasted group approach.

Sample. Sixty four head nurses were recruited by systematic random sampling from a total 614 head nurses administered in field-testing (k/n, 614/64). The total numbers of samples were computed by G*Power 3 program (Heinrich-Heine University, 2006). Thus, in each every 10 head nurses was recruited for testing of constructed validity.

Staff nurses or new nurse graduates who had less than one year experience were different from head nurses in administrative competency. The effect size in a two-group test of mean difference was estimated at .50 (medium), alpha value of .05, and power of .80 (Cohen, 1988 as cited in Polit & Beck, 2008), and then was computed by G*Power 3 program (Heinrich-Heine University, 2006). Estimating a 20 percent non-response rate, thus, a total of 76 subjects were used at the minimum sample size in this step. These participants were recruited by stratified sampling. The participants worked in the 30- to 90-bed community hospitals in which were four health regions to be selected in field-testing. In each region, the nineteen participants were recruited (25 percent). Then, the provinces were selected by simple random sampling until the researcher received the participants required. These participants were administered for testing of construct validity using contrasted group approach.

Data collection procedure.

1. The researcher contacted the Directors of nursing service of the community hospitals.

2. After receiving the permission from the Director of nursing service, the researcher mailed a Competency Assessment Scale for Staff Nurses in Community Hospitals, the Demographic Data Form, and the Informed Consent Form to the Director of nursing service in 27 community hospitals of four health regions. Then, these documents were distributed to 76 staff nurses for completing these documents.

3. After four weeks, sixty eight participants returned the scales, resulting in a 88.31 percent response rate. These returned scales were completed.

4. After the documents were returned, the researcher tested construct validity by comparing mean scores between head nurses and staff nurses.

Data Analysis. The data was analyzed by mean scores. An independent t-test was used to analyze the comparing mean scores between new nurse graduate and head nurses. The level of significance was .05.

The Demographic Form. The Demographic information questionnaires developed for directors of nursing service and head nurses with close-ended questions including age, sex, educational background, position, experience of working in the position, and had attended the 4 months administrative course. This form was used for head nurses in the step of pretesting the initial instrument (step 4) and field-testing (step 5).

The demographic data form included close-ended and open-ended questions such as sex, age, educational background, position, experience of working in the position, and the attended 4 months nursing course. This form was used for new nurse graduates in the step of contrasted group testing (step 5).

Protection of Research Subjects

Before collecting data, this study was approved by Research Ethic Review Committee of the Faculty of Nursing, Chiang Mai University. The researcher asked for permission to conduct the study from the directors of hospitals and of nursing service of the hospitals of each community hospital. Participants received a detailed explanation and written description about the purposes, methods, benefits of participating, and the time used in this study. They could ask questions regarding the details of this study at anytime. The participants were reassured that their responses were kept confidential, and the collected data was reported in a group. The participants were also requested to refuse to participate or withdraw from the study anytime. After that, the participants who agreed to participate in this study were asked to sign the informed consent form.