CHAPTER 3

Methodology

This chapter describes the methodology of present study which including a description of the research design, setting, population and sample, research instruments, protection of human right procedures, data collection procedures, and data analysis procedures.

Research Design

A descriptive correlational design was used to examine the level of LMX and PSC, and identified the relationship between LMX and each dimension of PSC among nurses in tertiary hospitals, Kunming, the People's Republic of China.

Population and Sample

Population

The target population of this study was 142 wards which included 4, 797 nurses who held a nursing qualification license and practiced in the four tertiary hospitals, Kunming, the People's Republic of China.

Sample

This study focused on the unit level analysis, nurses working in same inpatient ward and under supervision by the same head nurse were considered as a group. The sample size of this study was calculated by using the formula of Yamane (1973) and the sample size was 105 wards. The number of nurses chosen from each ward based on a study conducted by Ferris (1985), who chosen at least three nurses as a unit to analysis average leader-member exchange at units. Moreover, according to Shea and Guzzo' study (1987), a team was at least three members who viewed themselves as a group. Therefore, three nurses were chosen from each selected ward. Any nurse was not

willing to participate in the study, the other nurse in the same ward was added as a participant. Thus, the sample size was 105 wards representing the sample of 315 nurses. Proportional random sampling method was used to determine the number of wards in each hospital based on the amounts of wards of each hospital. The names of four hospitals, the number of wards and the number of nurses in each hospital were shown in Table 3-1.

Table 3-1

Number of Population and Sample

Hospitals	Number of Wards in Each Hospital	Number of Sample Wards in Each Hospital	Number of Sample Nurses in Each Hospital
1st AH	43	32	32×3=96
2nd AH	39	29	29×3=87
4th AH	32	24	24×3=72
3rd PHY	28	20	20×3=60
Total	142	105	315

1st AH: the First Affiliated Hospital of Kunming Medical University

2nd AH: the Second Affiliated Hospital of Kunming Medical University

4th AH: the Forth Affiliated Hospital of Kunming Medical University

3rd PHY: the Third People's Hospital of Yunnan Province

Inclusion criteria: 1). All level of RNs who held a nursing qualification license; 2). Nurse had worked as a register nurse at least 1 year at current ward in selected hospital; 3). Nurses were willing to participate in the study.

Exclusion criteria: 1). Nurses who held a position of "head nurse" or "manager"; 2). Nurses who were working in central supply unit, outpatient department and medical assistant department were not included in this study.

Sampling method. The wards in each hospital were selected used a simple random sampling according to calculation result. According to the name list of nurses who were willing to participate in the study of each selected ward, three nurses were decided by using a random number table until the required number of nurses were obtained.

Research Setting

Data was gathered from the nurses who worked in medical wards, surgical wards, pediatric wards, obstetrics-gynecology wards, intensive care wards, emergency wards and operation rooms from four provincial tertiary-A hospitals: the First Affiliated Hospital of Kunming Medical University (1st AH), the Second Affiliated Hospital of Kunming Medical University (2nd AH), the Forth Affiliated Hospital of Kunming Medical University (4th AH), and the Third People's Hospital of Yunnan Province (3rd PHY).

Research Instruments

The instrument used in this study was a self-administered questionnaire including three parts as follows:

Part I: Demographic Data Form

The demographic data form was developed by researcher to collect the study participants' information including age, gender, marital status, education level, work wards, work position, duration of work experience, work shift and employment type.

Part II: The Multidimensional Leader-member Exchange Scale (LMX-MDM)

The LMX-MDM was originally developed by Liden and Maslyn (1998). After getting permission of author. The Chinese version of LMX-MDM translated by Hu and Liden (2013) was used. The LMX-MDM contains 12 items with 4 items for each of 4 dimensions including: affect, loyalty, contribution, and professional respect. Each item was rated on a 7-point scale from 1 (strongly disagree) to 7 (strongly agree) to represent agreement. The total score ranges from 12 to 84. Compare mean score of four dimensions, the higher the score, the higher quality of leader-member exchange. For unit analysis, firstly, the score was derived by summing the items and dividing by the number of items that make up the scale. Secondly, individual score was averaged across team members to get a team score for each ward. The range of team score and meaning was categorized into low, moderate and high level, as follows:

	Low	Moderate	High
Mean score	1.00-3.00	3.01-5.00	5.01-7.00

Part III: Hospital Survey on Patient Safety Culture (HSOPSC)

The HSOPSC was originally developed by Sorra and Nieva (2004) for the Agency for Healthcare Research and Quality in USA. It has been translated into Chinese version by Li and Liu (2009). After getting permission from agency and translator, Chinese version of HSOPSC was used in this study. The questionnaire includes 12 dimensions: 1) frequency of events reported, 2) perceptions of patient safety, 3) supervisor/manager expectations and actions promoting safety, 4) organizational learning–continuous improvement, 5) teamwork within units, 6) communication openness, 7) feedback and communication about error, 8) non-punitive response to error, 9) staffing, 10) management support for patient safety, 11) teamwork across units, and 12) handoffs and transitions. Its 42 items comprised of 24 positively and 18 negatively worded items. Items were rated on a 5-point Likert's scale, ranging from 1 = strongly disagree to 5= strongly agree to presenting agreement; or rating from 1 = never to 5 = always, to presenting frequency. Positive response percentage (PRP) was calculated for overall dimensions and each dimension of HSOPSC. Responses for positive items rated "strongly agree/agree" or "always/most of the time" were positive. Conversely, response for negative items rated "strongly disagree/disagree" or "never/rarely" mean responses were positive. According to Sorra and Nieva (2004), PRP of each dimension or all dimensions equal to or higher than 75% was viewed as a strength area, and regarding 50% or less in the positive respondents dimension as an area needing improvement. Additionally, it also includes two single outcome items: 'patient safety grade' rated from A = excellent to E = failing; and 'number of incidents reported' rated from "a = no event reports" to "f = 21 event reports or more". For unit level analysis, PRP was derived by summing the items and dividing by the number of items that make up the scale. Individual positive percentage was averaged across ward members to get a team PRP for each ward. The range of ward PRP and meaning was classified into three ranks (Sorra & Nieva, 2004), as follows:

Positive percentage ≤ 50.0 % means area needing improvement

50%< Positive percentage<75% means moderate area

Positive percentage ≥ 75.0% means strength area

Validity of Instrument

1. The Multidimensional Leader-Member Exchange Scale (LMX-MDM). The validity of original LMX-MDM developed by Liden and Maslyn (1998) has been tested by exploratory factor analysis (factor loading of "affect" were .91, .80, and .72; for "loyalty" were .9, .74 and .70; for contribution were .86 and .81; and for professional respect were .97, .91 and .79). Confirmatory factor analysis of four factors indicated a good model fit (CFI = .986, GFI = .960, AGFI = .930).

2. Hospital Survey on Patient Safety Culture (HSOPSC). The validity of original HSOPSC developed by Sorra and Nieva (2004) has been tested by correlation analysis during instrument development, intercorrelation ranges from .23 to .66.

The original LMX-MDM and original HSOPSC were translated by Hu and Liden (2013), and Li and Liu (2009), respectively and were used in this study without any modification. Therefore, the validity of two instruments was not tested in present study.

Reliability of Instrument

1. The Multidimensional Leader-member Exchange Scale (LMX-MDM). The internal consistency reliability of LMX-MDM was tested before applying in this study by distributing questionnaires among 15 nurses who worked at the Third People's Hospitals of Yunnan Province but were not sample in this investigation. Cronbach's alpha coefficient of LMX-MDM was .98.

2. Hospital Survey on Patient Safety Culture (HSOPSC). In this study, the internal consistency reliability of HSOPSC was tested among 15 nurses who worked at the Third People's Hospital of Yunnan Province but were not sample in this investigation. Cronbach's alpha coefficient of HSOPSC was .91.

Protection of Human Subjects

Prior to data collection, the research proposal was submitted to the Research Ethics Review Committee of Faculty of Nursing, Chiang Mai University, Thailand and selected hospitals in order to obtain approval of the study before data collection. Researcher met directors of nursing department in each selected hospital. All participants were notified about the study objectives and methods. They were informed that this study was voluntary, they have the rights to refuse, stop or withdraw the study at any time without being punished or losing any benefits. During research data collection procedure, no risk was involved and no complications occurred on them. Moreover, a research consent forms were given to the subjects to assure protection of human rights of the participants. A statement was included in a cover letter to guarantee confidentiality and anonymity of individual response. Furthermore, information provided by subjects was only applied for study. Data provided by participants was kept confidential and anonymous all the time. Only code number was used for questionnaire follow-up. The results of the study were presented as a group without disclosing subjects' identifies. Finally, the consent form was written in accessible Chinese language in order to make sure participants easily understand it. Nurses who voluntarily agreed to take part in this study were asked to sign the consent form.

Data Collection Procedure

Data of this study were collected in four provincial tertiary-A hospitals, Kunming, the People's Republic of China from February to April, 2016. The following data collection was performed:

1. The research proposal was submitted to the Research Ethics Review Committee, Faculty of Nursing, Chiang Mai University.

2. After receiving the approval letter from the Research Ethics Review Committee of Faculty of Nursing, Chiang Mai University. The researcher met and submitted the approval letter, research proposal, and official letter to directors of nursing department in four selected hospitals.

3. Nursing department selected one coordinator to assistant data collection excluded 3rd PHY since researcher collected data in 3rd PHY. Coordinators were chosen following the criteria: 1) A nurse who practiced in the selected hospital; 2) A nurse who did not practice as a "head nurse" or an administrator; 3) A nurse was willing to work as a coordinator.

4. Researcher asked for the number of nurses in each ward from nursing departments. Then sampling were chosen based on a random number table.

5. Researcher informed coordinators about research objectives, benefits, data collection procedure and protection of human subjects.

6. Coordinators distributed questionnaires to participants who were randomly selected by the researcher and asked to complete questionnaires in their available time. Subjects were requested to separate consents forms and questionnaires before submitting.

7. The questionnaires were returned within two weeks in sealed envelopes to the box in each ward. The researcher coordinators collected questionnaires from the box and returned them to researchers.

8. Total 304 questionnaires were returned after three weeks. Researcher scrutinized the completeness of questionnaires and 5 incomplete questionnaires were excluded. The response rate was 94.9%. The 16 questionnaires were distributed to new participants in the 7 wards using random sampling. Finally, 315 nurses completed questionnaires and response rate was 100%.

Data Analysis Procedure

The data collected in this study was coded and entered into the Statistical Package for Social Science (SPSS) version 13.0 Program. Both descriptive and inferential statistics were used for data analysis. The significant level was set at .05. The data analysis procedure was performed as follows:

1. Demographic data was analyzed using frequency, percentage, range, mean and standard deviation.

2. LMX data was analyzed using mean, frequency and percentage.

3. PSC data was analyzed using frequency and percentage.

4. Data on LMX and PSC was tested for normal distribution using Kolmogorov-Smirrnov (KS) test which result reported data was non-normal distribution. Therefore, Spearman's Rank-Order Correlation was used to examine the relationship between LMX and PSC and with each dimension of PSC as well.

53