CHAPTER 4

Findings and Discussion

The purposes of this study were to examine leader-member exchange and patient safety culture, as well as the relationship between leader-member exchange and patient safety culture among nurses in tertiary hospitals, Kunming, the People's Republic of China. The findings were presented in four parts with tables and descriptions: 1) demographic data of the subjects; 2) leader-member exchange among nurses in tertiary hospitals, Kunming, the People's Republic of China; 3) patient safety culture among nurses in tertiary hospitals, Kunming, the People's Republic of China; 4) the relationship between leader-member exchange and patient safety culture among nurses in tertiary hospitals, Kunming, the People's Republic of China. Discussions were conducted according to the research objectives and the results of this study.

Findings

Demographic Characteristics of the Subjects

The subjects in this study were 105 wards consisted of 315 nurses who worked in four provincial tertiary-A hospitals, Kunming, the People's Republic of China. The demographic data of nurses was presented in table 4-1:

Table 4-1

Frequency, Percentage, Mean, Standard Deviation, and Range of Nurses Categorized by Demographic Characteristics (n=315)

Demographic Characteristics	Frequency (n)	Percentage
Age (years) (Mean=32.68, SD=7.95, Range=20-58)		
20-30	160	50.79
31-40	102	32.38
≥41	53	16.83
Gender		
Male	7	2.22
Female	308	97.78
Marital Status		
Single	83	26.35
Married	220	69.84
Divorced or separated	12	3.81
Education level		
Secondary technical certification	13	4.13
Associated degree	80	25.40
Bachelor degree	216	68.57
Master degree	6	1.90
Work position		
Staff nurse	237	75.24
In charge nurse	78	24.76
Duration of worked in current specialty or profession		
1-5 years	121	38.41
6-10 years	72	22.86
11-15 years	37	11.74
16-20 years	33	10.48
More than 21 years	52	16.51

Table 4-1 (continued)

Demographic Characteristics	Frequency (n)	Percentage
Work shift		
Day shift	115	36.51
Rotating shift	200	63.49
Employment type		
Permanent employment	136	43.17
Temporary employment	179	56.83
Working ward		
Medicine	123	39.05
Surgery	147	46.66
Obstetrics-Gynecology	9	2.86
Pediatrics	9	2.86
Emergency department	6	1.90
Intensive care unit	12	3.81
Operation room	9	2.86

As shown in Table 4-1, almost all of the participants were female (97.78%) and their ages were between 20 and 58 years old ($\overline{X} = 32.68$, SD = 7.95). About half of the nurses (50.79%) were between 20 and 30 years old. A majority of the nurses were married (69.84%), more than half of the nurses held a bachelor degree (68.57%). Most of the nurses were staff nurses (75.24%), and the proportion of charge nurses was 24.76%. For duration of worked in current specialty or profession, a majority of the nurses had 1 to 5 years of work experience (38.41%). Concerning work shift, the largest group of participants worked on rotating shifts (63.49%) and 36.51% worked on day shift. In terms of employment status, 43.17% of the nurses were permanent employees and 56.83% were temporary employees. These nurses mostly worked in medicine wards (39.05%) and surgery wards (46.66%); small proportions of nurses worked in obstetrics-gynecology wards (2.86%), pediatrics wards (2.86%), emergency departments (1.90%), intensive care units (3.81%), and operation rooms (2.86%).

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Table 4-2

Frequency and Percentage of Nurses Categorized by Perceived Safety Grade and
Number of Adverse Events Reported by Nurses (n=315)

Items	Frequency (n)	Percentage
Perceived safety grade in their hospital		
Excellent	57	18.10
Very good	156	49.52
Acceptable	97	30.79
Poor	4	1.27
Failing	1	0.32
Number of adverse events reported by nurses in last year		
No event report	165	52.38
1 to 2 event reports	124	39.36
3 to 5 event reports	16	5.08
6 to 10 event reports	9	2.86
11 to 20 event reports	1	.32

In table 4-2, in terms of two single outcome items, majority of the nurses (49.52%, n = 156) perceived that their hospital had very good patient safety. In the previous year, the majority of nurses (52.38%, n = 165) did not report adverse events whereas 39.36% (n = 124) of the nurses had reported 1 to 2 adverse events and about 8.26% (n = 26) of the nurses had reported at least 3 events.

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Leader-Member Exchange in Tertiary Hospitals, Kunming, the People's Republic of China

There were 105 wards in the study and this part illustrated the level of leader-member exchange in each ward. The result was shown in Table 4-3.

Table 4-3

Frequency and Percentage of Wards Categorized by Level of Leader-Member Exchange (n=105)

Leader-Member Exchange in each ward	Frequency (n)	Percentage
High level	81	77.14
Moderate level	24	22.86

Table 4-3 illustrated that the majority of the wards (77.14%) had a high level of leader-member exchange and 22.86% of the wards had a moderate level of leader-member exchange.

Patient Safety Culture among Nurses in Tertiary Hospitals, Kunming, the People's Republic of China.

This part illustrated frequency and percentage of wards categorized by the level of subscale and overall of patient safety culture. The result was shown in Table 4-4.

Table 4-4

Frequency and Percentage of Wards Categorized by the Level of Subscale and Overall of Patient Safety Culture (n=105)

Total and subscale of patient safety culture	Level of patient safety culture					
	Needing improvement area		Moderate area		Strength area	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Subscale of frequency of events reported	26	24.76	37	35.24	42	40.00
Subscale of perceptions of patient safety	23	21.90	57	54.29	25	23.81
Subscale of supervisor/manager expectation & actions promoting safety	4	3.81	23	21.90	78	74.29
Subscale of organizational learning–continuous improvement	3	2.86	13	12.38	89	84.76
Subscale of teamwork within hospital unit	6	4.76	13	12.38	87	82.86
Subscale of communication openness	42	40.00	52	49.52	11	10.48
Subscale of feedback and communication about error	4	3.81	22	20.95	79	75.24

Table 4-4 (continued)

Total and subscale of patient safety culture	Level of patient safety culture					
	Needing improvement area		Moderate area		Strength area	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Subscale of non-punitive response to error	76	72.38	24	22.86	5	4.76
Subscale of staffing	71	67.62	29	27.62	5	4.76
Subscale of hospital management support for patient safety	13	12.38	17	16.19	75	71.43
Subscale of teamwork across hospital units	30	28.57	45	42.86	30	28.57
Subscale of hospital handoffs & transitions	22	20.95	48	45.72	35	33.33
Overall patient safety culture	14	13.33	68	64.76	23	21.90

As shown in Table 4-4, concerning subscales of PSC, 40.00% of the wards had a favorable level in frequency of events reported. More than half of the wards (54.29%) had a moderate level in perceptions of safety. A majority of wards (74.29%) had a favorable level in supervisor/manager expectations & actions promoting safety, and up to 84.76% of the wards had a strength level in organizational learning-continuous improvement. About 82.86% of the wards had a positive level in teamwork within the hospital unit, and nearly half of the wards (49.52%) had a moderate level in communication openness. Most of the wards (75.24%) had a positive level in feedback and communication about error. Moreover, a majority of the wards (72.38%) required improvement in non-punitive response to error, and 67.62% of the wards required improvement in staffing. Furthermore, more than half of the wards (71.43%) perceived a favorable level in hospital management support for patient safety. A majority of the wards (42.86%) had a moderate level in teamwork across hospital units, and almost half of the wards (45.72%) perceived a moderate level in hospital handoffs & transitions. More than half of the wards (64.76%) had a moderate level in overall patient safety culture.

Relationship between Leader-Member Exchange and Each Dimension of Patient Safety Culture among Nurses in Tertiary Hospitals, Kunming, the People's Republic of China

This part demonstrated the relationship between leader-member exchange and patient safety culture. Data of leader-member exchange and patient safety culture was tested and showed was non-normal distribution. Therefore, Spearman's Rank-Order Coefficient was used to explore the correlation between two variables. Result was shown in Table 4-5.

Table 4-5

The Relationship Between Leader-Member Exchange and Patient Safety Culture

Overall and subscale of patient safety culture	Leader-Member Exchange
	Correlation Coefficient
Overall patient safety culture	.56**
Subscale of frequency of event report	.30**
Subscale of perceptions of safety	.33**
Subscale of supervisor/manager expectation & actions promoting safety	.34**
Subscale of organizational learning–continuous improvement	.51**
Subscale of teamwork within hospital unit	.55**
Subscale of communication openness	.51**
Subscale of feedback and communication about error	.51**
Subscale of non-punitive response to error	.26**
Subscale of staffing	.25**
Subscale of hospital management support for patient safety	.41**
Subscale of teamwork across hospital units	.50**
Subscale of hospital handoffs & transition	.02

** P<0.01

In Table 4-5, the result illustrated that the significant correlation was between leader-member exchange and patient safety culture. There was a positive relationship between leader-member exchange and overall patient safety culture ($r = .56$, $p < .01$). In terms of the relationship between leader-member exchange and subscales of patient safety culture showed positive relations in the subscale teamwork within hospital unit ($r = .55$, $p < .01$), organizational learning–continuous improvement ($r = .51$, $p < .01$), communication openness ($r = .51$, $p < .01$), feedback and communication about error ($r = .51$, $p < .01$), teamwork across hospital units ($r = .50$, $p < .01$), hospital management support for patient safety ($r = .41$, $p < .01$), supervisor/Manager expectation & actions promoting safety ($r = .34$, $p < .01$), perceptions of safety ($r = .33$, $p < .01$), non-punitive response to error ($r = .26$, $p < .01$), staffing ($r = .25$, $p < .01$) and frequency of event report ($r = .30$, $p < .01$). There was no relationship between leader member exchange and the subscale of hospital handoffs & transition ($r = .02$, $p > .05$).

Discussions

The results of the study were discussed in three parts follow by the research objectives including 1) Leader-member exchange in tertiary hospitals, Kunming, the People's Republic of China 2) Patient safety culture in tertiary hospitals, Kunming, the People's Republic of China 3) The relationship between leader-member exchange and patient safety culture in tertiary hospitals, Kunming, the People's Republic of China.

Leader-Member Exchange in Tertiary Hospitals, Kunming, the People's Republic of China

Leader-member exchange refers to the social exchange relationship between a head nurse and a nurse under supervision by that head nurse, including a sense of affect, loyalty, contribution and professional respect that influence and motivate the nurses to act in a manner valued by the head nurse. In Table 4-3, the research results showed 77.14% of wards (n=81) had a high level of leader-member exchange. This finding was more favorable than a moderate level of LMX ($\overline{X}$=4.41, SD=.68) which used a group level analysis in Canada (Laschinger et al., 2009).

The finding could be explained in regarding to the improvement of head nurses' management skills in Chinese hospitals. Recently, in Chinese hospitals, a nurse should take position competition before she or he being appointed as a head nurse. The comprehensive evaluation includes management in the ward, communication skill with employees, teamwork and so on. Head nurses' work would be appraised not only by management department but also their employees after a period of time. Thus, under the condition, head nurse could enhance awareness of management to guide them take action to develop relationship with whole group of nurses. A head nurse always foster and encourage staff nurses work together as a team since it is a requirement of management (Teng, 2013). Moreover, recently education level of head nurse has been improved and nurses can attend nursing management course in bachelor degree. Furthermore, requirement of head nurse management skill has changed not only limited in work performance but also consisted of systemic thinking, communication skill, planning and monitoring skills, and organizational skills and leadership skill (Li, Liu, & Kong, 2010). Meanwhile training for head nurse has increased which could improve

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head nurse management skill and knowledge, as a result it may be beneficial to dealing relationship in work place. According to Maslyn and Uhl-Bien (2001), subordinates perceived more amount of efforts paid by managers were related to higher leader-member exchange. In short, head nurses improve management skill and focus on developing qualified relationship with nurses may lead a positive effect on leader-member exchange development.

Another possible explanation may be the demographic characteristics of the participants. Among the subjects, 24.76% (n=78) of them were charge nurses (Table 4-1). Normally, charge nurses handle some management tasks and assist head nurse, therefore, they always work as partners with head nurses. More opportunity to communicate and contact with head nurses perhaps is a motivator for leader-member exchange development. Moreover, in terms of work duration, about 61.59% of nurses worked more than 5 years (Table 4-1), more work experience might be have more opportunity to contact with head nurse. Nahrgang, Morgeson, and Ilies (2009) stated that leader-member exchange relationship between leader and subordinate increase over time and then stabilize. In addition, as high as 68.57% of nurses have earned a bachelor degree (Table 4-1), as mentioned previously, nurses could learn more management knowledge and may know how to be good followership, thus more positive relationship may occurred with head nurse. Furthermore, Chinese hospitals was applying the "equal pay for same work" (Wang, 2011) also could clarify high leader-member exchange perceived by nurses since this policy made temporary nurses feel they received fair treatment in hospital. When subordinates perceived leaders as fair, it had been shown to related to high quality relationship between head nurses and staff nurses (Erdogan, Liden, & Kraimer, 2006). Therefore, even though there are more than half of nurses (56.83%) were only temporary employees (Table 4-1), leader-member exchange still at a favorable level.

Additionally, a high quality relationship between head nurses and staff nurses might be due to staff nurses were respected by head nurses, so that they refer to make more contribution on their work. Normally, in morning shift meeting and nursing meeting, nurses freely give suggestion and discussion toward to patients' situation and work in department, head nurse always encourages the behavior, listens to them

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attentively, concerns about their suggestions and praises them when a good idea is provided. According to Yukl, O'Donnell, and Taber (2009), behaviors of leader: supporting, recognizing and consulting were positively related to leader-member exchange development. Under the situation, nurses would like to perform work not only limited in their job description.

Chinese culture also might be an effect that contributed to high level of leader-member exchange. In Chinese society, Confucianism, an important part of Chinese traditional culture, which advocate to improve character of people and interpersonal harmony (Zhao, Wang, Mi, & Zhou, 2014), thus nurses prefer to maintain a good interpersonal relationship in workplace. In this study, 75.24% of participants were staff nurses (Table 4-1). Chinese are viewed as hierarchical (Luo, 2011), and normally nurses concede to high position and tend to maintain a good relationship with managers (Luo, 2011). Moreover, Chinese were considered collectivist which strongly emphasize on maintaining harmony relationship among groups members (Luo, 2011).

On the other hand, 22.86% of wards (n=24) still perceived a moderate level of leader-member exchange, which would have negative influence on nurses performing their work in a manner desired by head nurse. Notably, this study was conducted using a group level analysis which useful for indicating variety of leader-member exchange in each ward rather than analyze data in an individual level. It means LMX still need to be improved in part of wards since it did not perform as well as expectation. The item rated the lowest score was "*My manager defends (would defend) my work actions to a supervisor, even without complete knowledge of the issue in question*" ($\overline{X}$=4.90, SD=.99) (Appendix A). In clinic wards, some head nurses merely think nurses' problems attribute to patients' complaints, this may discourage nurses' enthusiasm (Wen & Xiao, 2013). Head nurse would not defend staffs may due to lacking of trust in staff nurse. In addition, in Chinese hospitals, nurses have to provide high quality of care even work with limited resource (Luo, 2011) and nurses have a low professional status in Chinese society (Sui et al., 2005). Under the situation, however, head nurses may have inefficient power to support nurses in public since head nurses are directed by director of ward and director of nursing department. Moreover, relationship between nurses and patients is strained in P. R. China and this situation could prone to conflict

between patients and medical staff (Zhang, 2013). Therefore, head nurse do not defend nurses before they finding out root causes of affair.

Patient Safety Culture in Tertiary Hospitals, Kunming, the People's Republic of China

As shown in Table 4-4, majority of the wards (64.76%) had a moderate level in overall patient safety culture. The possible reason for the result is that Chinese Ministry of Health launched quality management and qualified treatment procedures in order to ensure patient safety. Chinese Hospital Association presented annual patient safety goals and provided effective strategies for healthcare professionals in 2007, which suggested that healthcare staff should be encouraged to initiatively report AEs and relative risk factors, create a non-punitive report system, learn from mistakes, find root causes from system management and participate in Chinese Medical Association voluntary non-punitive report system (Cao, 2007).

However, numbers of barriers may impact on PSC in P. R. China. First of all, China's healthcare system has being facing severe nursing shortage. In Yunnan province, the number of nurses was 1.59 per 1,000 population which was lower than the minimum standard set by WHO (National Bureau of Statistics of China, 2014). Lin (2012) illustrated a high level fatigue on physical exertion, lack of energy, and lack of motivation among nurses in Yunnan province. Moreover, Luo (2011) found a moderate level of burnout among nurses in Yunnan. Inadequacy of staffing leaded to heavy workload for healthcare workers, in turn to, negatively related to PSC development (Liu et al., 2013). Another possible obstacle may be the traditional blame culture in P. R. China. Liu et al., (2013) showed some managers viewed punishing workers as an effective manner of promoting learning. A punitive response may lead to unwilling of nurses to report errors in clinic work. Moreover, traditionally, Chinese regarded error reporting as losing face and feeling shame (Feng et al., 2012). People were shy away from discussing or reporting errors (Nie et al., 2013) rather than considering errors were important opportunities to prevent similar mistakes (Dai et al., 2009). Thus, PSC perceived by nurses in tertiary hospitals was found to be a moderate level.

Considering the results of study in each dimension of patient safety culture:

Frequency of events reported. It refers to all types of mistakes are reported. The types of mistakes include mistakes caught and corrected before affecting the patient; mistakes with potential to harm the patient; and mistakes that could harm the patient but do not. About 40% of the wards in tertiary hospitals in Yunnan province perceived frequency of event report was a strength area and about 35.24% of the wards had a moderate level of frequency of event report (Table 4-4). One possible explanation for the wards where had a strength on frequency of event report may be the progress of understanding types of adverse events. Previously, there was no standard guideline for writing incident report, which leaded healthcare workers had a vague recognition and initiatively reported only the adverse events which had factual harm result (Wei & Tian, 2011). Hence, the Ministry of Health formulated that "Medical errors and adverse events reporting system" stated adverse events are not only limited to events which actually harm to patients but also includes some mistakes that have potential harm (Wei & Tian, 2011). Moreover, hospital provided training of adverse events classification and reporting process for staffs. In addition, managers in hospital endeavored to build a climate which encouraged healthcare worker to report adverse events without punishment (Cao, 2007).

However, 35.24% of the wards had a moderate level of frequency of event report (Table 4-4). One possible reason may be nurses' concern about negative effect due to error reporting. In this study, item rated the lowest positive response rate is "When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported" (Appendix B), about 42.86% regarded it as need to be improved. This implied that nurses usually do not report mistake if error is corrected before negatively impact on patient safety. According to Xie, Shi, Luo, and Zhang (2014), the top three negative factors related to adverse events reporting were healthcare workers worried about adverse events reporting may negatively affect relationship between colleagues and may damage to own reputation; moreover, nurses felt they are too busy to report events. Chinese is collectivist, therefore, people feel embarrassed themselves and feel embarrassed as a team member once they made mistakes (Zhou et al., 2015). Nie et al. (2013) stated that healthcare professionals shown to be hesitant to discuss or report

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mistakes in Chinese setting. Moreover, a moderate level of burnout had found among nurses in university hospitals in Yunnan province (Luo, 2011). In addition, no IT reporting system was applied in Yunnan hospitals. Normally, nurses should filled several forms and submit them to management department. Thus, nurses have to spend their spare time to report adverse events. Mwachofi, Walston, and Al-Omar (2011) illustrated that IT reporting systems were significantly positively related to perception of patient safety. The final reason may a non-punitive response environment has not performed well in Chinese hospitals. Nurses worried about the approach manager treating error reporting may bring unwanted effect on their career development (Cai et al., 2006) or it would be wrote in personal file (Nie et al., 2013). According to Zhou, Zhao, Dong, and Wu, (2014), a punitive culture has been found is the primary obstacle of adverse events reporting.

Perception of safety. Perception of safety refers to procedures and systems are good at preventing errors and lack of patient safety problems. In this study, a large number of the wards (54.29%) had a moderate level in perception of safety (Table 4-4). This may be due to the importance of safety which had been emphasized in P. R. China and hospitals has attempted to establish a standard system to prevent errors occur. Since 2007, Chinese Hospital Association presented annual patient safety goals and provided effective strategies for healthcare professionals (Cao, 2007). It suggested that healthcare staff should be encouraged to report AEs and related risk factors actively, create a non-punitive report system, learn from mistakes, find out foot causes from system management and participate in Chinese Medical Association voluntary non-punitive report system (Cao, 2007). Under the situation, various activities were conducted, such as continuous education, academic communication (Zhang & Li, 2008) and creating accreditation standards for hospitals (Cao, 2007). Thus, nurses can follow criterion to preventing adverse events occur in work place. As a result it can promote patient safety in hospitals.

However, in this dimension, the most problematic item was "*We have patient safety problem in this unit*", about 60% of the wards perceived it was an area need to be improved (Appendix B). A possible explanation may be Chinese hospitals still face great challenges since high risk exists during the procedure of health care delivery (Cao,

2007). Nurses perceived patient safety was not performed well within unit since numbers of barriers were hard to solve such as nursing shortage. In addition, Dai et al. (2009) stated that almost hospitals set a reporting system but failed in data analysis, evaluation and giving feedback about errors. Another explanation may be demographic characteristic of the nurses. In this study, about 38.73% of the nurses had more than 10-year work experience. Staff who had more work experience in unit negatively related to perception of PSC (Bodur & Filiz, 2010; Feng et al., 2012). Nurses who have more work experience were more likely to recognize potential safety hazards and they disclosed their real perception (Feng et al., 2012). In summary, almost of wards (54.29%) perceived a moderate level of "perception of safety" in their units.

Supervisor/manager expectation and actions promoting safety. This implied that supervisor/managers in the ward considered staffs' suggestions for improving patient safety, praised staff for following patient safety procedure, and did not overlook patient problems. About 74.29% of the wards had a strength level in "supervisor/manager expectation and actions promoting safety" (Table 4-4). One possible explanation may be due to that patient safety is an indispensable component in Chinese hospitals. According to Cao (2007), ensure patient safety has become a consensus of health and administration departments, hospital associations, hospital managers and healthcare workers in P. R. China. Moreover, implementing relevant rules and regulations of patient safety, suggestions from the first line nurses are very significant. As we know that nurses are people who spend more time directly work and have frequent contact with patients (Nie et al., 2013), they could provide practicable suggestions to overcome the gap between regulation and clinic practice. Besides, nurses could immediately find out the problems related with patients' safety. As a result, manager endeavored to ensure patient safety and concerned about nurses' suggestions. In Yunnan hospitals, managers provided more opportunities to interact and communicate with each other, such as shift changing report (Luo, 2011). Physicians and nurses freely communicate patient situation and discuss issues of department (Luo, 2011). Furthermore, manager recognized that patient safety should not only rely on one staff but nurses should work together, thus managers prefer to have model staff among nursing team to positively influence other nurses (Dong, 2012). As a result, managers

would like to praise nurses who do work following procedure and concern patient safety in order to motivate other nurses take actions as expectation (Dong, 2012).

Organizational learning-continuous improvement. Organizational learning-continuous improvement refers to there is a learning culture in which mistakes lead to positive changes and changes are evaluated for effectiveness. In this study, 84.76% of the wards had strength on organizational learning-continuous improvement (Table 4-4). The result may due to management of patient safety has improved in Chinese hospitals. Firstly, all tertiary hospitals were involved in Hospital Accreditation System which emphasized on a specific guideline of adverse events management and continuous improvement from mistakes (Cao, 2007). Secondly, management departments have been set to analyze adverse events (Cao, 2007). Thirdly, guidelines of adverse events reporting procedure were constantly improved for healthcare worker to follow (Jiao, Wang, & Yan, 2016). Fourthly, numbers of management tools have been applied to find out root causes of adverse events such as fishbone diagram (Ding et al., 2015).

Teamwork within hospital units. It means that staff supports one another, treat each other with respect and work together as a team. Regarding this dimension, 82.86% of the wards had a strength level on it (Table 4-4). Teamwork within hospital unit refers to staff support one another, treat each other with respect and work together as a team. The result was favorable, it may be related to Chinese culture. Harmony is the priority in Chinese culture. This emphasizes on collaboration, so Chinese are warm and they are pleasure to help other people (Nie et al., 2013). Another explanation is the nature of nursing work. Cooperating with each other is critical to achieve quality of care since nurses perform various task for same patients within a ward. Individual cannot cope with every nursing task alone. Normally, numbers of programs conducted require nurses work together, share information, discuss problem and provide solution in ward such as adverse events analysis. This can provide more opportunities for nurses cooperating together. As a result, it promoted teamwork among nurses. However, high workload may lead nurse want to help others but they do not have enough time and power to support each other. This may contribute parts of wards perceived a moderate level of teamwork within unit. In summary, about 82.86% of wards had a positive level in teamwork within hospital unit.

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Communication openness. It refers to staff freely speak up if they see something that may negatively affect a patient, and feel free to question those with more authority. Nearly half of the wards (49.52%) had a moderate level in communication openness. It may be due to managers encouraging staff to participate in patient safety (Table 4-4). In Yunnan hospitals managers provided more opportunities for giving suggestions or recommendations for each staff in order to improve quality of care and ensure patient safety. Nurses who take care patients are more familiar with patient's condition and problems during practice. Nurses discuss solutions in morning handover and monthly nursing meeting. Managers listen to and respect nurses and would praise them if suggestion is functional. This makes staff members feel comfortable to speak up if they see something that negatively affect patient care. However, Chinese culture do not promote staff feeling free to question the decision or actions of those with more authority. Confucianism, the heart of Chinese cultural values, highlight individual should concern own social position (Khairullah & Khairullah, 2013). Decision-making in Chinese organization tends to be authoritative and Chinese employees rarely question formal authority (Khairullah & Khairullah, 2013). Traditionally, Chinese are viewed as hierarchical and normally nurses concede to high positions' opinions and tend to maintain a good relationship with managers (Luo, 2011). Therefore, the large number of wards in Chinese hospitals had a moderate level in communication openness.

Feedback and communication about error. It refers to staff were informed about errors that happen, given feedback about changes implemented and discuss ways to prevent errors. About 75.24% of the wards had strength in feedback and communication about error (Table 4-4). This may be due to hospitals recognize error was the most valuable resource for patient safety improvement. In 2005, "patient safety" was the theme of Chinese hospital management annual conference and patient safety has been regarded as a component of medicine tele-education in 2008 (Zhang & Li, 2008). Moreover, activity "medical quality supervision in 10 thousand mile trip" was conducted nationwide (SAGPA, 2013). Chinese Hospital Association set patient safety goals and stated hospitals should learn from mistakes (DOC88, 2011). Furthermore, patient safety has been written down into medicine textbook since 2007 (Zhang & Li, 2008). Another possible explanation may be patient safety management is a critical part in hospital quality management in hospitals. Cao (2007) mentioned that

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hospital accreditation clearly defined requirement of adverse events management. Nursing department should monitor effectiveness of strategies used to reduce adverse events. Furthermore, staff nurses should be invited to share and discuss cause of errors within wards.

Non-punitive response to error. It means that staff feels that their mistakes and event reports are not held against them, and that mistakes are not kept in their personnel file. About 72.38% of the wards required improvement in non-punitive response to error (Table 4-4). One possible reason is negative impacts of Chinese traditional punitive culture. Most Chinese hospitals still follow punitive-oriented patterns to treat staffs such as writing it in the file or reduce bonus when adverse events occurred, which focus on individuals rather than the event itself (Chen, Hu, Wei, Mao, & Liu, 2016). Even a non-punitive response system creating is urgent on patient safety culture building. Some managers have been shown to regard punishing workers as an effective manner to promote learning (Liu et al., 2013). According to Cai et al (2006) stated that nurses worried about the approach manager treat error reporting may bring unwanted effect on their career development. A punitive culture has been found was the primary obstacle of adverse events reporting (Zhou et al., 2015). Another reason may be lack of trust towards to managers as mentioned previously. Trust is a key factor determines staff perceive safety climate and their attitudes toward safety, this association confirms trust directly influence staff engage in safety behavior (Conchie, Donald, & Taylor, 2006). Thus, nurses perceived non-punitive response to error was an area need to be improved.

Staffing. It means there are enough staff to handle the workload and work hours are appropriate to provide the best care for patient. About 67.62% of wards required improvement in staffing (Table 4-4). A possible reason for the result is Chinese nursing shortage. There were 2.78 million nurses in P. R. China (The Statistics Portal, 2015). It has been illustrated higher than half of nurses felt there was insufficient staff to handle high workload and always complete task too quickly in P. R. China (Feng et al., 2012; Liu et al., 2013; Wang et al., 2014). Inadequacy of staffing would lead to heavy workload for healthcare workers and, in turn to, negatively relate to patient safety culture development (Liu et al., 2013). By the end of 2013, there were 73,305 RNs in Yunnan province and the number of nurses per 1,000 population was 1.59 which is

lower than the minimum standard (National Bureau of Statistics of China, 2014). Another possible explanation may be nursing staffing is inappropriate. Normally, nurses usually take care of 10 patients during the day shift and have to take care of about 20 to 30 patients in night shift in Yunnan (Luo, 2011). Nurses take care regular patients and emergency operational patients as well. Sometimes, nurses nurse also have to rescue patients. Furthermore, a high level of fatigue on physical exertion, lack of energy and lack of motivation among nurses was found in Yunnan province hospitals (Lin, 2012). Thus, under a complex environment, 85.72% of wards perceived "*We work in 'crisis mode' trying to do too much, too quickly*" (Appendix B) which was rated as the most problematic item.

Hospital management support for patient safety. It refers to hospital management in their ward provided a work climate that promoted patient safety and showed that patient safety was a top priority. About 71.43% of the wards had strength in hospital management support for patient safety (Table 4-4). One possible explanation may be that safety has been emphasized by Chinese healthcare system and managers have built up consciousness of patient safety. In P. R. China, quality care is the priority in the reform of China's healthcare system and poor quality care is viewed as the root cause contribute to medical error (SAGPA, 2013). In order to build a patient safety climate and overcome existent issue, Chinese healthcare system have taken action through three levels. Cao (2007) stated that in the macro level, government has enacted laws and regulations; in the meso level, administration department of public health has introduced numbers of policies and standard guidelines; and in the micro level, hospitals conducted activities to response above calls. Another explanation may be with the economic growing, patients' demands of qualified and safe healthcare service were increasing. Moreover, patients' consciousness of legal rights and monitor of safe healthcare service were increasing lead managers pay attention to enhance patient safety development (Zhao & Meng, 2007). Hospital set variety of quality assurance teams and risk management teams, among them patient safety is one part of these teams (Cao, 2007). Furthermore, manager always conduct training program and share information within ward (Wang et al., 2014). Therefore, nurses can understand regulations, vision, and resource provided by hospitals.

Teamwork across hospital units. It refers to hospital units cooperate and coordinate with one another to provide the best care for patients. About 42.86% of the wards had a moderate level in teamwork across hospital units (Table 4-4). This result was in contrast to the result on the dimension on "teamwork within hospital unit". Some activities need healthcare workers cooperate across units such as multidisciplinary team. Regarding multidisciplinary team, it has been shown lacking of inefficient communication across management department and clinic unit may lead low efficiency (Zuo et al., 2016). One possible explanation may be that cooperation across different wards is more difficult since more healthcare workers are included in the process. Moreover, high workload within hospital wards may contribute to healthcare professionals finding difficult to take adequate time to discuss solutions with other wards. As a result, majority of wards had a moderate level in teamwork across hospital units.

Hospital handoffs and transitions. It means that patient care information is transferred across hospital units and during shift changes. Majority of the wards (45.72%) had a moderate level in hospital handoffs & transitions (Table 4-4). Notably, positive response rate analysis of each item showed information transition from shift to shift within unit was more favorable than information transition across units. The result also showed that the most favorable item was "*Important patient care information is often lost during shift changes*", it was a positive area in 56.19% of wards (Appendix B). That could related to handover procedure has been standardized in hospitals. SBAR handover has been applied (Lan & Zhu, 2012) and managers conducted a risk review in morning shift (Ma, 2015) which may ensure comprehensive information transmission between shift to shift. In Yunnan hospitals, normally, a director and a head nurse take part in morning shift who listen to information of each patient and review patients' conditions. Staff nurses and physicians transmit patients' information following handover procedure. Moreover, managers monitor handover. Both manager and healthcare worker have opportunity to suggest advices and share information in order to ensure patient safety. Moreover, almost hospitals in Yunnan province adopted a bedside shift reporting which provide opportunity for nurses to confirm patient information. Thus, important patient care information can be transferred during shift changes.

However, the most negative item rated was "*Problems often occur in the exchange of information across hospital units*", which was an area needing improvement in 52.38% of the wards (Appendix B). One possible explanation may be because information exchange across units is more complicated than handover within a unit. Handoff is not only transfer patients' information across shift to shift or to another unit but also provides opportunity to question and confirm information (Friesen, White, & Byers, 2008). Normally, more healthcare workers are involved in the procedure such as nurse, physician and healthcare aid. Variety of factors lead to inefficient patient transfer including delay or wasted time caused by communication breakdowns, waiting for responses from other nurses or physicians or a response from patient placement management or bed control (Friesen et al., 2008). In addition, nurses work under a high workload and always are very busy. Thus, nurses may do not confirm and question each information of patients. Moreover, health care worker's interpersonal communication skill, knowledge and experience level significantly impact on handoff (Friesen et al., 2008). Furthermore, different wards require specific knowledge for taking care patient, therefore nurse have to transfer large information to another ward. However, nurses may do not master comprehensive clinical knowledge or lack of inefficient work experience, which may be a barrier for nurse receiving holistic patient's information.

Relationship between Leader-Member Exchange and Patient Safety Culture among Nurses in Tertiary Hospitals, Kunming, the People's Republic of China

The result of this study illustrated that there was a significant positive correlation between LMX and overall PSC (r=.56, p<.01) (Table 4-5). LMX also significantly positively related to 11 dimensions of PSC including subscale of organizational learning-continuous improvement (r=.51, p<.01), teamwork within hospital unit (r=.55, p<.01), communication openness (r=.51, p<.01), feedback and communication about error (r=.51, p<.01), perception of safety (r=.33, p<.01), supervisor/manager expectation & actions promoting safety (r=.34, p<.01), hospital management support for patient safety (r=.41, p<.01), teamwork across hospital units (r=.50, p<.01), non-punitive response to error (r=.26, p<.01), staffing (r=.25, p<.01) and frequency of event report (r=.30, p<.01) (Table 4-5). However, no relationship was found between LMX

and subscale of hospital handoffs & transition (Table 4-5). The result interpreted that nurses perceived a more positive patient safety culture when a high quality of LMX exist between themselves and head nurse. These results supported framework of this study, which high quality of LMX can enhance the level of affect, loyalty, contribution, and professional respect, resulting in respond by performing safety communication and, safety commitment, as well as the presence of expanded safety role behaviors and a strong safety culture (Hofmann & Morgeson, 1999; Hofmann et al., 2003). The results were quite similar with previous study (Thompson et al., 2011), which showed perceptions of PSC varied in units with high LMX compared with low LMX in dimensions of supervisor expectations and actions promoting safety ($F = 26.65$, $p < .001$), organizational learning-continuous improvement ($F = 3.79$, $p = .034$), communication openness ($F = 4.05$, $p = .027$), feedback and communication about error ($F = 5.16$, $p = .012$), and non-punitive response to error ($F = 6.28$, $p = .005$). However, the result was not congruent with one previous Chinese study conducted by Feng and peer's (2012) in which found no significant relationship between LMX and PSC.

LMX as the quality of dyadic social exchange relationship between a head nurse and a nurse under supervision by that head nurse, including a sense of affect, loyalty, contribution and professional respect that influence and motivate the nurses to act in a manner valued by the head nurse (Liden & Maslyn, 1998). Possible reason for the correlation relationship may be explained by LMX theory (Liden & Maslyn, 1998) which posited that high quality of relationship between leader and subordinates can foster affect such as friendship which mainly developed based on interpersonal attraction rather than work and professional value. Such an affect can increase more trust and reduce power distance between head nurse and subordinates. Nurses may feel more comfortable to offer advices on patient safety promoting when they regard head nurse as a friend. The study finding also support the study by Liu et al. (2013). Liu et al. (2013) stated that lack of trust had negative impacts on health care workers endorse idea in open communication environment creation and learning from mistakes.

High relationship between head nurse and staff nurse may promote employee expresses public support for organizational goals and individual character of the other

member of the LMX dyad (Liden & Maslyn, 1998). Moreover, when nurses perceived high LMX with head nurse may show contribution which means employees take responsibility and complete task not only limited to job description or resource head nurse provided (Liden & Maslyn, 1998). In hospital, patient safety has become consensus of administration department, hospital association, hospital manager and healthcare workers (Cao, 2007). Nurses normally work under a high workload condition, they may only complete task limited in job description since copious nursing tasks have to handle. However, nurses may spend extra vigor to heed ways to improve patient safety once they are highly responsible for and support organization. Liden and Maslyn (1998) explained members perceive professional respect which nurses perceive the level to which each member of the dyad has built a reputation, with and/or outside the organization, of excelling at his or her line of work is a content of LMX. If nurses esteem head nurse's management skill and professional knowledge, they may regard head nurse as the role model and respect head nurse (Yang et al., 2013) and may be willing to endorse head nurse's work in order to achieve organizational goals. According to Yang et al. (2013) explained that nurses' perception of respect may increase citizen behavior which means nurses voluntarily dedicate to performing in work place that not limited to role requirement and is not a rewarded job achievement in work contract.

However, the results showed no relationship between LMX and subscale of hospital handoffs and transition. The possible reason may be that handover & transition is ritual in clinic work, which is influenced by variety of factors, such as environment, interaction between nurses and knowledge of nurses (Friesen et al., 2008). Moreover, handoff and transition is closely related to continuity nursing care in nurses' own work shit; nurses may ask question about patient's condition and confirm confused information during information transition no matter high or low quality of LMX with head nurse.