การแลกเปลี่ยนระหว่างผู้นำกับสมาชิกและวัฒนธรรมความปลอดภัยของผู้ป่วยตามการรับรู้ของพยาบาลในโรงพยาบาลตติยภูมิ คุนหมิง สาธารณรัฐประชาชนจีน

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

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บทคัดย่อ

วัฒนธรรมความปลอดภัยของผู้ป่วยเป็นสิ่งสำคัญในการป้องกันไม่ให้เกิดเหตุการณ์ไม่พึงประสงค์ในโรงพยาบาล อย่างไรก็ตามยังคงมีช่องว่างองค์ความรู้เกี่ยวกับความสัมพันธ์ระหว่างการแลกเปลี่ยนระหว่างผู้นำกับสมาชิกกับวัฒนธรรมความปลอดภัยของโรงพยาบาลในประเทศจีน วัตถุประสงค์ของการศึกษานี้เพื่ออธิบายการแลกเปลี่ยนระหว่างผู้นำกับสมาชิกและวัฒนธรรมความปลอดภัยของผู้ป่วย รวมทั้งศึกษาความสัมพันธ์ระหว่างการแลกเปลี่ยนระหว่างผู้นำกับสมาชิกกับ 12 ด้านของวัฒนธรรมความปลอดภัยของผู้ป่วยในโรงพยาบาลระดับตติยภูมิ คุนหมิง สาธารณรัฐประชาชนจีน กลุ่มตัวอย่างในการวิจัยนี้คือ พยาบาล 315 คนจาก 105 หอผู้ป่วย เครื่องมือที่ใช้ในการวิจัย ประกอบด้วย 1) แบบบันทึกข้อมูลส่วนบุคคล 2) แบบวัดหลายด้านของการแลกเปลี่ยนระหว่างผู้นำกับสมาชิก (LMX-MDM) ที่พัฒนาขึ้นโดย ไลเดน และ มาสลีน (Liden & Maslyn, 1998) และ3) แบบสำรวจวัฒนธรรมความปลอดภัยของผู้ป่วยในโรงพยาบาล (HSOPSC) นี้ ที่พัฒนาโดย ซอร่า และ เนว่า (Sorra & Nieva, 2004) ซึ่งเครื่องมือ LMX-MDM และ HSOPSC มีค่าสัมประสิทธิ์อัลฟาของครอนบาคเท่ากับ 0.98 และ 0.91 ตามลำดับ ข้อมูลที่ได้นำมาวิเคราะห์ในระดับหอผู้ป่วย โดยใช้สถิติเชิงพรรณา และสหสัมพันธ์แบบสเปียร์แมน

ผลการวิจัยพบว่า

1. ร้อยละ77 ของหอผู้ป่วยมีการแลกเปลี่ยนระหว่างผู้นำกับสมาชิกอยู่ในระดับสูง ขณะที่ประมาณร้อยละ 23 มีการแลกเปลี่ยนระหว่างผู้นำกับสมาชิกอยู่ในระดับปานกลาง

2. ร้อยละ22 ของหอผู้ป่วยมีวัฒนธรรมความปลอดภัยของผู้ป่วยโดยรวมอยู่ในระดับที่เข้มแข็ง ร้อยละ 65 มีวัฒนธรรมความปลอดภัยของผู้ป่วยโดยรวมอยู่ในระดับปานกลาง ในขณะที่ประมาณร้อยละ 13 มีวัฒนธรรมความปลอดภัยของผู้ป่วยโดยรวมอยู่ในระดับที่ต้องปรับปรุง

3. การแลกเปลี่ยนผู้นำกับสมาชิกมีความสัมพันธ์เชิงบวกกับ 11 ด้านของวัฒนธรรมความปลอดภัยของผู้ป่วยใน ในขณะที่การแลกเปลี่ยนผู้นำกับสมาชิกไม่มีความสัมพันธ์กับวัฒนธรรมความปลอดภัยของผู้ป่วยในด้านการส่งเวรและการเคลื่อนย้ายผู้ป่วยในโรงพยาบาล

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การศึกษานี้ทำให้ได้ข้อมูลที่มีประโยชน์ในการทำให้ผู้บริหารโรงพยาบาลและผู้บริหารการพยาบาลตระหนักถึงความสำคัญของวัฒนธรรมความปลอดภัยของผู้ป่วยและมีข้อเสนอแนะให้ผู้บริหารโรงพยาบาลและผู้บริหารการพยาบาลว่าควรมีการส่งเสริมให้เกิดความสัมพันธ์ที่ดีระหว่างหัวหน้าพยาบาลกับพยาบาล เพื่อทำให้เกิดวัฒนธรรมความปลอดภัยของผู้ป่วยในโรงพยาบาล

คำสำคัญ : Leader-Member Exchange, Patient Safety Culture, Nurses, Tertiary Hospital, China

Abstract

Patient safety culture is critical for hospitals to prevent adverse events occurring. However, gaps still remain regarding the relationship between leader-member exchange and patient safety culture in China. The purposes of this study were to describe leader-member exchange and patient safety culture in China, and to examine the relationship between leader-member exchange and each dimension of patient safety culture in tertiary hospitals in Kunming, the People's Republic of China. The research sample consisted of 315 nurses, representing 105 wards. The research instruments included: 1) Demographic Data Form, 2) the Multi-Dimensional Leader-Member Exchange Scale (LMX-MDM) developed by Liden and Maslyn (1998), and 3) Hospital Survey on Patient Safety Culture (HSOPSC) developed by Sorra and Nieva (2004). The Cronbach's alpha coefficients for LMX-MDM and HSOPSC were .98 and .91 respectively. Data were analyzed using descriptive statistics and Spearman's Rank-Order Correlation Coefficient.

The findings of this study were as follows:

1. Approximately 77% of the wards had a high level of leader-member exchange, while the rest had a moderate level of leader-member exchange.

2. Approximately 22% of the wards had a strength area in overall patient safety culture. About 65% had a moderate area in overall patient safety culture, while 13% of the wards need improve in overall patient safety culture.

3. There was a positive relationship between leader-member exchange and the subscales of patient safety culture, except in the case of the subscale of hospital handoffs and transition.

The results of this study could provide valuable information for hospital administration and nurse managers to be aware of the importance of patient safety culture and to set up interventions to enhance leader-member exchange in order to promote patient safety culture.

Key words: Leader-Member Exchange, Patient Safety Culture, Nurses, Tertiary Hospital, China

Background and Significance

Patient safety has a substantial direct effect on patients' lives and an indirect effect on cost of patient care in health systems (D'Amour, Dubois, Tchouaket, Clarke, & Blais, 2014). In response to the problems of patient safety, hospitals carry out a series of initiatives to prevent adverse events, including encouraging patient safety culture (PSC) (The Research Priority Setting Working Group, 2008). PSC refers to the product of individual and group values, attitudes, perceptions, competencies and patterns of behavior that determine the commitment to, and the style and proficiency of, an organization's safety management (Nieva, & Sorra, 2003). It consists of frequency of events reported, perceptions of patient safety, supervisor/manager expectations and actions promoting safety, organizational learning–continuous improvement, teamwork within units, communication openness, feedback and communication about error, non-punitive response to error, staffing, management support for patient safety, teamwork across units, and handoffs and transitions (Sorra & Nieva, 2004). Positive PSC contributes to patient safety such as fewer in-hospital complications or adverse events (Mardon, Khanna, Sorra, Dyer, & Famolaro, 2010). Moody, Pesut, and Harrington (2006) studied PSC on nursing units in U.S.A., finding showed that dimensions of openness of communication, aspects of error reporting norms, and hospital handoffs and transitions of patients were areas need to be improved. Therefore, creating a high quality PSC is essential to overcome the challenge of patient safety.

Developing a culture of safety has been a core element of many efforts and a critical determinant of the success of activities intended to improve safety (Halligan & Zecevic, 2011). Leaders play an important role in promoting PSC (Tregunno, et al., 2009). Leader-member exchange (LMX) is one leader behavior that is related to successful safety outcomes in the organization. LMX is defined as the quality of social relationships between subordinates and leaders (Liden & Maslyn, 1998). When good relationships between subordinates and leaders occur, staff members create high senses of affect, loyalty, contribution and professional respect, resulting in a response of performing in a manner desired by the leader (Liden & Maslyn, 1998). High LMX has been shown to faster constructive safety communication and raise staff members' safety concerns and suggest safety strategies (Hofmann & Morgeson, 1999). However, previous studies showed that LMX was a moderate level between nurses and head nurse (Laschinger, Finegan, & Wilk, 2009, 2011).

In P. R. China, the Ministry of Health set a variety of regulations and outlines in order to enhance quality of care and patient safety, such as "Outline of Development Plan for Nursing in China (2011-2015)" (Department of Medical Administration, 2012). Activities were conducted as part of this campaign. For example, "patient safety" was the theme of a Chinese hospital management annual conference, setting a special journal column for patient safety and risk management (Zhang & Li, 2008). Also, "patient safety" was introduced as a component of medical education (Zhang & Li, 2008). However, Chinese hospitals still face many barriers to achieve patient safety, such as nursing

shortages that lead more than half of the nurses to feel high workload and complete tasks too quickly (Feng, Bobay, Krejci, & McCormick, 2012; Liu, Liu, Wang, Zhang, & Wang, 2013; Wang, et al., 2014). About 68% of the nurses perceived no "non-punitive response to error" in their hospitals (Wang et al., 2014), and most respondents preferred to keep silent about mistakes due to the punitive environment (Wang, et al., 2014; Liu et al., 2013). The results of previous studies are limited to explain the linkage between LMX and PSC. There is one study (Feng et al., 2012) which examined the relationship between LMX and PSC among nurses in a tertiary hospital; the results showed no significant relationship between LMX and PSC. The results of Feng's study are not consistent with another study (Thompson, Hoffman, Sereika, & Lorenz, 2011) that showed a positive relationship between LMX and PSC among nursing personnel. The inconsistent findings were drawn from different study designs. Feng's study used an individual level analysis which was contrary to the unit level analysis in Thompson's study. Notably, employees develop homogenous perceptions concerning supervisory safety practices within group and the perceptions vary between subunits, resulting in significantly different safety scores (Blegen, Pepper, & Joseph, 2005). Therefore, unit analysis is a better fit than individual analysis in PSC study. This study will use unit level analysis to examine the relationship between LMX and PSC in Chinese hospitals. The findings of this study could provide crucial information for hospital managers to foster PSC in Chinese hospitals.

Objectives

This study aims to examine LMX and PSC among nurses in tertiary hospitals, Kunming, the People's Republic of China and to explore the relationship between LMX and PSC.

Conceptual Framework

The conceptual framework in this study was based on Liden and Maslyn's multidimensional leader-member exchange model (1998) and Sorra and Nieva's patient safety culture model (2004). According to the literature review (Hofmann & Morgeson, 1999; Hofmann, Morgeson, & Gerras, 2003), high quality of leader-member exchange can enhance the level of affect, loyalty, contribution, and professional respect, resulting in responses of performing safety communication, safety commitment and presence of expanded safety role behaviors and a strong safety culture. The relationship between LMX and PSC was examined in this study.

Methodology

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

Population and Sample

The target population was 142 wards from four tertiary provincial tertiary-A hospitals in Kunming, the People's Republic of China. This study focused on the unit level analysis; nurses working in the same inpatient ward and under supervision by the same head nurse were considered as a group. The number of nurses

chosen from each ward was based on a study conducted by Ferris (1985), who chose at least three nurses as a unit to analyse average leader-member exchange at units. Therefore, three nurses were chosen from each selected ward. The sample size of this study was calculated by using the formula of Yamane (1973). Thus, the sample size was 105 wards—or 315 (105 × 3 = 315) register nurses. Proportional random sampling method was used to determine the number of wards in each hospital based on the number of wards in the selected hospitals.

Research Instruments

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

1. Demographic Data Form. This form consisted of many questions including age, gender, marital status, education level, work position, duration of work experience, work shift, employment type and, work wards.

2. The Multidimensional Leader-Member Exchange Scale (LMX-MDM) was developed by Liden and Maslyn (1998) and was translated to Chinese version by Hu and Liden (2013). It has 12 items and each item was rated on a 7-point scale from 1 (strongly disagree) to 7 (strongly agree) representing agreement. It contains four dimensions: affect , loyalty, contribution, and professional respect. Each dimension has 3 items. The range of score was categorized into low (Mean=1.00-3.00), moderate (Mean=3.01-5.00) and high level (Mean=5.01-7.00). The validity of the LMX-MDM showed a good model fit (CFI = .986, GFI = .960, AGFI = .930) (Liden & Maslyn, 1998). In this study, the reliability of this scale was tested, and it yielded a Cronbach's alpha of .98.

3. Hospital Survey on Patient Safety Culture (HSOPSC) was developed by Sorra and Nieva (2004) and was translated to Chinese version by Li and Liu (2009). the questionnaire includes 12 dimensions:1) frequency of events reported (3 items), 2) perceptions of patient safety (4 items), 3) supervisor/manager expectations and actions promoting safety (4 items), 4) organizational learning–continuous improvement (3 items), 5) teamwork within units (4 items), 6) communication openness (3 items), 7) feedback and communication about error (3 items), 8) non-punitive response to error (3 items), 9) staffing (4 items), 10) management support for patient safety (3 items), 11) teamwork across units (4 items), and 12) handoffs and transitions (4 items). Its 42 items were rated on a 5-point Likert's scale ranging from 1 (strongly disagree) to 5 (strongly agree) for presenting agreement, or rating from 1 (never) to 5 (always) for presenting frequency. Positive response percentage (PRP) was calculated for overall dimensions and each dimension of HSOPSC. Each dimension was classified into three ranks based on range of ward PRP: area needing improvement (PRP = 50.0%), moderate area (50%<PRP<75.0%), and strength area (PRP= 75.0%). Additionally, it also includes two single outcome items: 'patient safety grade' and 'number of incidents reported'. The validity of HSOPSC was tested by correlation analysis, which showed intercorrelation ranges from .23 to .66. (Sorra and Nieva, 2004). In present study, the reliability and the scale was tested and the results showed a Cronbach's alpha of .91.

Data Collection

Self-administered questionnaires were used to collect data from February to April, 2016. Three coordinators were chosen from the selected hospitals. Coordinators and researchers distributed the questionnaires, and participants were asked to return them within two weeks. There were 304 questionnaires returned and 5 of them were incomplete. The response rate was 94.9%. Then 16 questionnaires were distributed to different nurses from 7 wards. Finally, 315 nurses completed the questionnaires (3 nurses per ward), which is a response rate of 100% response rate.

Ethical Considerations

The research study was approved by the Research Ethics Committee in the Faculty of Nursing, Chiang Mai University, Thailand. Permission for data collection was obtained from the directors of the nursing departments in the selected hospitals in Kunming, the People's Republic of China. All participants were notified of the study objectives, data collection methods, and the right to refuse, stop or withdraw from the present voluntary study at any time without losing any benefits. A research consent form was handed to each participant in order to ensure protection of human rights. A sealed envelope was used for each participant's completion of and return of the surveys to ensure anonymity. Information provided by subjects was only applied for this study and kept confidential.

Data Analysis Procedures

The data were analyzed by using the SPSS version 13.0 program. The significance level was set at .05. The results of the study were presented as a group. The score was derived by summing the items and dividing by the number of items that make up the scale. Individual scores were averaged across members to get a score for each ward for LMX-MDM; meanwhile, individual PRP was averaged across ward members to get a team PRP for each ward of HSOPSC. Descriptive statistics were used to describe demographic data of the subjects and the level of LMX and PSC. The data of LMX and PSC showed a non-normal distribution; therefore, Spearman's Rank-Order Correlation was used to examine the relationship between two variables.

Results

Demographic Data

The study sample was 105 wards representing 315 nurses. Almost all of the participants were female (97.78%) and their ages were between 20 and 58 years old (= 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%), and 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%. A majority of the nurses had 1 to 5 years of work experience (38.41%). The largest group of participants worked on rotating shifts (63.49%). In terms of employment status, 43.17% of the nurses were permanent employees. These nurses mostly worked in medical wards (39.05%) and surgical 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%).

Leader-Member Exchange

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

Table 1 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

Patient Safety Culture

More than half of the wards (64.76%) had a moderate area in overall PSC (Table 2). Concerning subscales of PSC, results demonstrated that 84.76% of wards perceived a strength area in organizational learning-continuous improvement, 82.86% of wards had a strength area on teamwork within the hospital unit, 74.29% of the wards had a strength area of supervisor/manager expectation & actions promoting safety, 71.43% of wards had strength area in hospital management support for patient safety and most of the wards (75.24%) had a strength area in feedback and communication about error. However, 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.

Table 2 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
Overall patient safety culture	14	13.33	68	64.76	23	21.90
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

Table 2 Frequency and Percentage of Wards Categorized by the Level of Subscale and Overall of Patient Safety Culture (N = 105) (continue)

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 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
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

Relationship between Leader-Member Exchange and Patient Safety Culture

The results demonstrated that there was a positive relationship between LMX and overall PSC ($r = .56$, $p < .01$). Positive relationships were found between LMX and 11 subscales of PSC and no significant relationship was found between LMX the subscale of handoffs & transition (Table 3).

Table 3 The Relationship between Leader-Member Exchange and Patient Safety Culture

Overall and subscales 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

Discussion

Leader-Member Exchange (LMX): The results showed that 77.14% (n = 81) of the wards had a high level of LMX (Table 1). This finding was more favorable than previous studies showed a moderate level (Laschinger et al., 2009, 2011). The high quality of LMX may be due to the fact that head nurses generally encouraged nurses to offer suggestions and advice and, praised them when a good idea was provided. It has been shown that behaviors of leaders including supporting, recognizing and consulting were positively related to LMX development (Yukl, O'Donnell, & Taber, 2009). Another reason may be Chinese culture. Firstly, Confucianism, an important part of Chinese culture, advocates improving the character of people and interpersonal harmony (Zhao, Wang, Mi, & Zhou, 2014). Moreover, Chinese is considered collectivist, which strongly emphasizes maintaining harmonious relationships among group members (Luo, 2011).

The demographic characteristics of the subjects may explain the high quality of LMX. About 24.76% (n = 78) of the nurses were charge nurses; they normally work as partners to assist head nurses. Moreover, 61.59% of the nurses had worked for more than 5 years. Nurses

working as a partner and working with longer work experience may have more opportunities to have contact with head nurses. LMX has been shown to increase over time and then stabilize (Nahrgang, Morgeson, & Ilies, 2009). Additionally, 68.57% of the nurses had earned a bachelor's degree, so they could learn more management knowledge and understand the way to be good followers. Furthermore, Chinese hospitals applied the "equal pay for same work" policy (Wang, 2011), which may have made temporary nurses feel fair treatment in the hospital. When subordinates perceive leaders as fair, it had been shown to relate to high quality LMX (Erdogan, Liden, & Kraimer, 2006). Therefore, even though more than half of the nurses (56.83%) were only temporary employees, LMX was still at a favorable level.

Patient Safety Culture (PSC): A majority of the wards (64.76%) had a moderate area in overall PSC (Table 2). This result may be explained by patient safety being given attention in the Chinese healthcare system, such as presenting annual patient safety goals, encouraging a non-punitive report system, and learning from errors (Cao, 2007). The results demonstrated that 84.76% of wards perceived a strength area in organizational learning-continuous improvement, 82.86% of wards had a strength area on teamwork within the hospital unit, 74.29% of the wards had a strength area of supervisor/manager expectation & actions promoting safety and about 71.43% of wards had strength area in hospital management support for patient safety. This finding was more favorable than the previous study (Fujita, Seto, Kitazawa, Matsumoto, & Hasegawa, 2014). A possible explanation may be to the fact that patient safety has become a consensus of health and administration departments, hospital associations, hospital managers and healthcare workers in China (Cao, 2007). Managers apply tools learn from errors and provide more opportunities to interact and communicate with each other, such as in shift changing reporting.

Results also illustrated that approximately 75% of the wards had strength in feedback and communication about error. However, nearly half of the wards (49.52%) had a moderate area in communication openness and 45.72% of the wards had a moderate area in hospital handoffs & transitions. The finding was similar with the result of the study (Fujita et al., 2014). This may be because managers provided more opportunities for nurses giving suggestions to ensure patient safety in morning handover and nursing meetings. However, in China, decision-making in organizations tends to be authoritative and employees rarely question formal authority (Khairullah & Khairullah, 2013).

Some area in patient safety culture are needed to improve, 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. The result quite similar with previous study (Fujita et al., 2014). These findings may be related to progress of adverse events consciousness. The Ministry of Health formulated that adverse events are not only limited to events which actually harm the patient but also includes mistakes that have potential harm (Wei & Tian, 2011). Chinese hospitals set a reporting system but failed in data analysis, evaluation and giving feedback

about errors (Dai, Shi, & Mao, 2009). In term of staffing, there is a nursing shortage in China. The number of nurses per 1,000 population was 1.59 (National Bureau of Statistics of China, 2014), which is lower than the minimum standard. Moreover, nurses usually take care of 10 patients during the day shift and have to take care of about 20 to 30 patients during the night shift in Yunnan (Luo, 2011).

Relationship between LMX and PSC: The results of this study illustrated that there was a significant positive correlation between LMX and overall PSC ($r = .56$, $p < .01$). LMX also significantly positively related to most subscales of PSC; however, no significant relationship was found between LMX and the subscale of hospital handoffs & transition (Table 4). These results supported the framework of this study and were similar to a previous study conducted by 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, organizational learning-continuous improvement, communication openness, feedback and communication about error, and non-punitive response to error. However, the result was not congruent with the Chinese study conducted by Feng and peer's (2012) in which found no significant relationship between LMX and PSC. A possible reason for the relationships can be explained by the LMX theory developed by Liden and Maslyn (1998). High quality of LMX can enhance the level of affect, loyalty, contribution and professional respect resulting in responding by performing safety communication and safety commitment, as well as the presence of expanded safety role behaviors and a strong safety culture. For example, employees show contribution when they take responsibility and complete task not only limited to job description or resource (Liden & Maslyn, 1998). However, no relationship was found between LMX and the subscale of hospital handoffs & transition. A possible reason is that handover and transition are rituals in clinic work, which are influenced by a variety of factors, such as environment, interaction between nurses, and knowledge of nurses (Friesen, White, & Byers, 2008). Moreover, handoff and transition are closely related to continuity nursing care in nurses' own work shifts; they may confirm patient conditions during information transition despite high or low quality of relationships with head nurses.

Conclusions

The purposes of this study were to examine the level of LMX and PSC perceived by nurses and to explore the relationships between LMX and PSC. There was a high level of LMX in 77.14% (n = 81) of the wards, while 22.86% (n = 24) of the wards had a moderate level of LMX. Overall PSC was a strength area in 21.90% (n = 23) of the wards and 64.76% (n = 68) of the wards had a moderate area in overall PSC. However, 13.33% (n = 14) of the wards needed to improve PSC. Furthermore, positive relationships were found between LMX and dimensions of PSC except the subscale of hospital handoffs & transition.

Implications and Recommendations

The findings of the study reported several

dimensions of PSC were need to be improved, such as the subscales of communication openness, non-punitive response, teamwork across units and staffing. Therefore, nursing administrators should find solutions to improve the above components of PSC within nursing wards. Moreover, the results supported that LMX is an effective strategy to promote patient safety culture. Nursing administrators should be concerned about the importance of leader-member exchange and pay attention to providing a way to increase leader-member exchange in order to enhance patient safety culture.

Based on these findings, future research is needed to be carried out to replicate this study in primary and secondary healthcare institutions in Chinese region. Moreover, future study should explore factors influencing patient safety culture.

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