CHAPTER 4

Findings and Discussion

The purposes of this study were to explore the level of innovative behaviour of nurses, as well as explore factors related to innovative behavior of nurses in autonomous hospitals, the P. R. China. The findings are presented in three parts: 1) Demographic data of the subjects. 2) Innovative behavior of nurses in Autonomous Hospitals, the People's Republic of China. 3) Factors related to innovative behavior of nurses in Autonomous Hospitals, the People's Republic of China. Discussion is conducted based on research objectives and results of this study.

Findings

Part I: Demographic Characteristics of the Subjects

Sample for this study consisted of 385 nurses, the demographic data of the subjects are presented in Table 4-1.

Table 4-1

Frequency, Percentage, Mean, Standard Deviation and Range of the Subjects Categorized by Demographic Characteristics (n=385)

Demographic Characteristics	Frequency (n)	Percentage (%)
Gender		
Male	10	2.60
Female	375	97.40
Age ($\bar{u}$ = 30.75, SD = 6.67, range = 21-59 years old)		
21-30 years old	245	63.64
31-40 years old	104	27.01
>40 years old	36	9.35
Marital status		
Single	94	24.42
Married	274	72.47
Divorce	12	3.11
Educational attainment		
Diploma and Associate degree	199	51.43
Bachelor's degree	187	48.57
Job title		
Junior nurse	138	35.58
Senior nurse	247	64.42

Table 4-1 (continued)

Demographic Characteristics	Frequency (n)	Percentage (%)
Work department		
Medical department	129	33.53
Surgical department	113	29.35
Obstetric Gynaecology department	25	6.49
Paediatric department	33	8.57
Intensive Care Unit	25	6.49
Operative Room	23	5.97
Emergency Room	19	4.93
Out-patient Department	18	4.67
Years of working		
($\bar{x}$ = 9.21, SD= 7.30, range= 2-35years)		
2-10 years	268	69.61
11-20 years	82	21.30
21-30 years	29	7.53
>30 years	6	1.56
Employment status		
Temporary nurse	264	68.57
Permanent nurse	121	31.43

Based on Table 4-1, majority of subjects were female (97.40%), 63.64% of subjects were in age group of 21-30 years old and 72.47% were married. The diploma and associate degree holders (51.43%) were more than bachelor's degree (48.57%) holders. More than half of the subjects were senior nurse (64.42%). Regarding years of working of subjects has been worked 2-10 years (69.61%) and more than half of the subjects were temporary nurses (68.57%). As well as 33.53% of the subjects worked in Medical Department, followed

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Surgical Department (29.35%), Pediatric (8.57%), Obstetric Gynecology (6.49%), Intensive Care Unit (6.49%), Operative Room (5.97%), Emergency Room (4.93%) and out-patient Room (4.67%).

Part II: Innovative Behavior of Subjects in Autonomous Hospitals, the People's Republic of China

This part illustrated frequency and percentage of subjects categorized by the level of overall score of innovative behaviour, as well as the mean score and standard deviation of innovative behaviour. The result was presented in Table 4-2.

Table 4-2

Mean, Standard Deviation and Level of Innovative Behavior (n=385)

Variable	Mean	SD	Level
Innovative behavior	3.12	.56	Moderate
Idea generation	3.52	.58	Moderate
Support obtaining	2.82	.60	Moderate
Idea realization	3.04	.79	Moderate

Based on in Table 4-2, mean score of overall innovative behavior was 3.12, and SD was .56 which indicated a moderate level of innovative behavior of nurses. The stage of idea generation was rated the highest mean score (3.52, SD = .58), followed by support obtaining ($\bar{u}$= 2.82, SD = .60), idea realization ($\bar{u}$= 3.04, SD = .79),

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Part III: Factors Related to Innovative Behavior in Autonomous Hospitals, the People's Republic of China

This part presented the descriptive statistic of knowledge sharing and job autonomy of subjects. The result was shown in Table 4-3. The Pearson Product-moment Correlation Coefficient among four variables was used. The result was presented in Table 4-4. And factors predicting innovative behavior was showed in Table 4-5.

Table 4-3

Range, Mean and SD of Knowledge Sharing and Job Autonomy (n=385)

Variable	Range	Mean	SD	Level
Knowledge sharing	1 - 4.37	2.68	.59	Quite low
Job autonomy	1.33 - 7	4.54	1.07	Quite high

Table 4-3 presented the mean score of knowledge sharing was 2.68 (SD = .59) and at a quite low level. The mean score of job autonomy was 4.54 (SD = 1.07) at a quite high level.

Table 4-4

Pearson Product-Moment Correlation Among Innovative Behavior, Job Title, Educational Attainment, Knowledge Sharing and Job Autonomy (n = 385)

	JT	EA	KS	JA	IB
JT	1.00	.30**	.07	.05	.07
EA	.30**	1.00	.09	.01	.10
KS	.07	.09	1.00	.22**	.63**
JA	.05	.01	.22**	1.00	.20**
IB	.07	.10	.63**	.20**	1.00

Note. JT = job title, EA = educational attainment, KS = knowledge sharing, JA = job autonomy, IB = innovative behavior

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** p < .01

In Table 4-4, the results of Pearson Product-moment Correlation showed a strong positive correlation between innovative behavior and knowledge sharing (r = .63, p < .01), and a weak positive relationships between innovative behavior and job autonomy (r = .20, p < .01), as well as a weak positive correlation between job autonomy and knowledge sharing (r = .22, p < .01). However, there were no relationship between job title and innovative behavior (r = .07, p > .05), and between educational attainment and innovative behavior (r = .10, p > .05).

Table 4-5

Multiple Regression Analysis of the Factors Predicting Innovative Behavior (n = 385)

Variables	B	β	t	P
JT	.01	.01	.28	.78
EA	.04	.04	.89	.38
KS	.58	.61	14.98	.00*
JA	.04	.07	1.75	.08

Note. JT = job title, EA = educational attainment, KS = knowledge sharing, JA = job autonomy

R = .64, R^2 = .40, Adjusted R^2 = .40, F = 64.36, *p<.01

In Table 4-5, knowledge sharing was significant predictor of innovative behavior (β = .61, p < .01). This predictor could explain 40 % of variability in innovative behavior among the subjects. Other three factors could not predict innovative behavior.

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Discussion

The discussion of the findings consists of two parts according to the research objectives including 1) Innovative behavior of nurses in Autonomous Hospital, the People's Republic of China. 2) The factors related to innovative behavior of nurses in Autonomous Hospital, the People's Republic of China.

Innovative Behavior of Nurses in Autonomous Hospital, the People's Republic of China

Innovative behavior refers to an act of seeking and developing new methods, techniques and work patterns, as well as introducing and applying the new idea into work. The results of this study showed a moderate level and the mean score of innovative behavior was 3.12 (SD =.56; Table 4-2). The results were consistent with a previous study (Liu et al., 2015) which indicated that nurses in tertiary hospitals had a moderate level of innovative behavior ($\bar{\mathrm{u}}$ = 3.25, SD = .64). Another study by Yang (2015) also indicated that nurses in thirty-three hospitals with different levels had a moderate level of innovative behavior ($\bar{\mathrm{u}}$ = 3.39, SD = .85).

The possible explanation of moderate level of innovative behavior among Chinese nurses may be that they could perform well on some subscales of innovative behavior but not well on other subscales of innovative behavior. In this study, results revealed that the mean score of subscale idea generation ($\bar{\mathrm{u}}$ = 3.52, SD = .58) was higher than support obtaining ($\bar{\mathrm{u}}$ = 2.82, SD = .60) and idea realization ($\bar{\mathrm{u}}$ = 3.04, SD = .79; Table 4-2). This implied that the participants in this study had performed quite well on idea generation, following by idea realization and performed less well on support obtaining.

Innovative behavior in the workplace begins by nurses identifying a work-based problem and generating ideas or solutions for the problem (Bao et al., 2013). In this study, nurses had performed quite well on the idea generation stage ($\bar{\mathrm{u}}$ = 3.52, SD = .58), the results showed all participants reported that they had performed the behavior "*Generate the*

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intention to deal with problem", and 59.22 % of participants marked high scores (score 4 and score 5; Appendix A, Table A2). The possible explanation may be that increasing opportunities were provided to nurses for presenting their ideas within the department and hospital, so this may promote nurses to generate ideas. For instance, hospital-wide nursing rounds and consultations that involve nurses who worked in different areas with different job titles or education levels, may obtain and combine new knowledge to generate new ideas to solve patients' problems (Jin, 2004). The questioning of nursing managers in morning conferences promotes nurses to recognize problems and to learn more knowledge purposefully, then generate ideas actively (Pi, 2015). Additionally, Quality Control Circle and a mentoring teaching mode are applied in the nursing area in autonomous hospitals. More opportunities were provided to nurses for sharing their ideas and obtaining others' knowledge, so that nurses may create more new ideas for problems. This may be the explanation of nurses' good performance in this stage.

Although nurses in this study performed quite well on the idea generation stage, they did not perform well on the stage of support obtaining ($\bar{u}$ = 2.82, SD = .60). A possible reason may be that approximately 63.64% of nurses in the study were young nurses between the age of 21-30 years old (Table 4-1). Moreover, 68.57% (n = 264) of participants were temporary nurses (Table 4-1), which may lead to be the lack of competences to obtain support from the organization, particularly technical and financial support. The mean score of the item "*Investigate and survey the new methods, in order to obtain more information and data*" was 2.93 (SD = .84; Appendix A, Table A2). Innovative behavior was a complex process (Scott & Bruce, 1994), junior nurses with limited knowledge and experience may not completely understand the whole process. Additionally, the lack of nurses who accepted higher levels of education or obtained higher levels of job title in clinical departments, junior nurses may not obtain systematic technical guidance within the clinical department. For example, in this present study, there were no nurses who hold a master's or doctoral degree in the three hospitals, and only 2.6% of nurses who obtained the job title "assistant chief senior nurse" in Dali Bai Autonomous Prefecture People's

Hospital by the end of 2016. This may lead to nurses perform less on investigating new methods.

The results also indicated 35.84% of participants reported they never "*Seek financial aid for the new methods*" ($\bar{u}$ = 1.96, SD = .90; Appendix A, Table A1 and A2). In P. R. China, A national wide report showed 90% nurses agreed that the social status of nurse is very low (China Youth News, 2017), even some nurses viewed themselves affiliates to physicians. Some nurses considered obtaining the financial support of the hospital as quite difficult, thus they may not bother to make the effort. In the other hand, the innovative ability of Chinese nurses was low due to the lack of innovative trainings, a heavy workload and the numerous nurses accepted lower level of nursing education (Ku, 2010). In present settings, 27.6% and 22% of nurses hold bachelor's degree in Dali Bai and Dehong Dai Jingpo Autonomous Prefecture People's hospitals respectively. In addition, 68.57% (n = 264) of participants were temporary nurses (Table 4-1). Temporary nurses were provided less opportunities than permanent nurses to improve their education and nursing skills (Sun, 2012). The nurses who work at autonomous hospitals may not have enough knowledge and technical support for innovation. Therefore, they do not have the competencies to provide a qualified proposal for new solution to persuade leaders and obtain financial support. Thus, they performed less behavior at this stage.

In terms of the stage of idea realization ($\bar{u}$ = 3.04, SD = .79; Table 4-2), participants performed better than the stage of support obtaining. This might because these items "*Applying implementation plans to work*" ($\bar{u}$ = 3.29, SD = .90; Appendix A, Table A1), and "*Revise implementation plans and apply into work*" ($\bar{u}$ = 3.06, SD = .99; Appendix A, Table A1) were rated with a high score. One possible reason is the majority of nurses were senior nurses (64.42%) in this study. Senior nurses may have more knnowlegde on innovation than junior nurses, once an implementation plan was developed, they can apply it to nursing work, also they can revise it based on the outcomes. Another possible explanation is due to the lack of motivation in applying new ideas into nursing care. In P. R. China, most

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hospitals do not issue specific regulations to guide, motivate and enhance nurses' innovative behavior. Only one national regulation is executed in all hospitals for all professionals, namely "the New Technique and Project Regulatory Regime", which emphasizes the management of new technique and projects, but it may not be enough of an incentive for professionals to develop specific implementation plans for new methods.

Additionally, in recent years, nursing innovation competitions were occasionally organized among some tertiary hospitals, which did motivate more nurses to participate in innovation during this short time. For instance, several hospitals organized the first time nursing innovation competition in 2016 (Tian, 2016; Wang & Tian, 2016; Wang, 2016). As well as in the settings of this study, only one nursing competition was organized in Dali Bai Autonomous Prefecture People's Hospital in 2015, for another two settings, there were no activities conducted to encourage nurses' innovation. Consequently, the lack of a long-term incentive mechanism may not motivate nurses to perform innovative behavior in their daily work.

The Factors Related to Innovative Behavior of Nurses in Autonomous Hospitals, the People's Republic of China

There are four factors hypothesized to associate with and predict innovative behavior. Results showed that knowledge sharing and job autonomy were associated with innovative behavior but only knowledge sharing could predict innovative behavior of nurses when controlling other three variables. The relationship between each factor and innovative behavior will be discussed as bellows.

Knowledge sharing. Knowledge sharing refers to a set of nurses' behaviors involving sharing one's work-related knowledge and expertise with other nurses within a team or a hospital. In Table 4-2, the results showed quite low level with mean of 2.68 (SD = .59). The results supported that Chinese nurses had low performance on knowledge sharing behavior in their work. It was consistent with previous studies (Chen et al., 2016;

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Gao et al., 2016) which were conducted among nurses in tertiary hospitals in P. R. China, and showed the mean scores were 2.80 (SD = .83) and 2.36 (SD = .69) respectively.

Possible reasons of these findings were explained by the low score for the items measuring the knowledge sharing among nurses. In the present study, the item "*Contribute ideas and thoughts to hospital online databases*" had a very low mean score ($\bar{\square}$ = 1.99, SD = .90). And 40.81% of participants (n = 157) disagreed with the item "*Have online chats (e.g. e-mail, QQ and WeChat) with others to help them with their work-related problems*", as well as 53.52% of participants (n = 206) disagreed with the item "*Share ideas and thoughts on specific nursing topics through e-mail or hospital supported online community-of-practice system*" (Appendix B, Table B1). According to the above information, it is implied that in autonomous hospitals the P. R. China, although there are some channels to share knowledge via personal interaction or documents, but there was still a lack of the channels through the internet to search and share new ideas and knowledge. Recently, a hospital information system was implemented and applied in tertiary hospitals, but it was only used for the management of medical records, the role of sharing knowledge was ignored (Chen et al., 2016). Some social software such as "QQ" and "WeChat" is quite popular in P. R. China, which can be the pathway of group-discussion knowledge sharing, but most nurses did not adequately utilize these social softwares to share work-related knowledge. Thus, the lack of knowledge sharing platforms via the internet and insufficient usage of internet resources limited nurses' knowledge sharing behavior.

In terms of the relationship between knowledge sharing and innovative behavior of nurses in Autonomous Hospital, the P. R. China, the results of this study illustrated a strong significant positive relationship between knowledge sharing and innovative behavior (r = .63, p < 0.01; Table 4.4). It also showed that knowledge sharing could predict the variance of innovative behavior when controlling other factors (β = .61, p < .01; Table 4.5). This result was similar with the findings of Yu, Yu-Fang and Yu-Cheh's study (2013) which indicated a strong positive relationship between knowledge sharing and innovative behavior among employees in Taiwan, the P. R. China (r = .51, p < .01) and a study by Wang

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and Ding (2012) that revealed a moderate relationship (r = .45, p < .01) of knowledge sharing and innovative behavior among nurses in China. The findings of the present study was also congruent with Kim and Park's (2015) and Radaelli et al.'s (2014) studies which revealed knowledge sharing can predict innovative behavior (β = .41, p < .05; β = .30, p < .01). It means the more experience in knowledge sharing, the more innovative behavior there is among nurses.

The results supported the hypothesis that knowledge sharing can provide platforms and opportunities to nurses to obtain knowledge, communicate and develop new ideas, resulting in performing innovative behavior. The possible explanation of the findings may be that knowledge sharing assists nurses to not only share their knowledge, but also to obtain other knowledge (Hooff & De Ridder, 2004). Combination and integration of external and internal knowledge stimulate nurses to think more creatively and critically (Popadiuk & Choo, 2006). Knowledge sharing is also an occasion to promote the way of transferring ideas from one individual to other individuals (Li & Zheng, 2014) and provides the pathway of communities (Yi, 2009). The community is a group consisting of nurses who have the same interests and are eager to practice new methods, such as the Quality Control Circle within a team or the organization (Chen & Wu, 2016). In this type of group, all group members will contribute to coordinate and integrate different sets of knowledge for forming a new prototype or model, then they will apply, evaluate and revise it in their daily work (Howell & Sheab, 2001), so that the new idea is realized.

Job autonomy. Job autonomy refers to the degree of control or discretion a nurse is able to exercise with respect to these three work facets: method, scheduling and criteria. As showed in Table 4-3, the result showed that the participants of this study had quite a high level of job autonomy ($\bar{u}$ = 4.54, SD = 1.07). The explanation may regard to the transformation of nurse' roles during the implementation of holistic nursing care of responsibility system. Since 2010, Chinese nursing care was transformed from functional nursing care to holistic nursing care of responsibility system. Meanwhile, the role of nurse

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was transformed to "primary nurse", who takes the responsibility of providing all nursing care for one patient till discharge (Wang & Yang, 2010). This requires the primary nurse should know more about the patient's situations, then determine what nursing care the patient needs and what is the appropriate method, determine the sequence of each nursing activities, as well as determine what outcomes need to be accomplished (Xu et al., 2011; Yin et al., 2013). In the present study, the dimension of "method autonomy" got the highest mean score ($\bar{u}$ = 4.73, SD = 1.19; Appendix C, Table C1). A little more than 75% of participants (n = 290) agreed *"I have some control over the sequencing of my work activities (when I do what)"* (Appendix C, Table C2). It illustrated that the majority of participants have sufficient autonomy on methods selection and work arrangement.

The current study also revealed that there was a weak positive bivariate relationship between job autonomy and innovative behavior of nurses in Autonomous Hospital, the P. R. China (r = .20, p < .01; Table 4-4). However, job autonomy could not explain the variances of innovative behavior when controlling the effect of knowledge sharing (β = .07, p > .05; Table 4-5). This means that without knowledge sharing, job autonomy could not independently effect innovative behavior. The study by Foss, Minbaeva, Pedersen, and Reinholt (2009) supported the strong relationship between job autonomy and knowledge sharing and indicated that the more job autonomy was given to individuals, the higher level of intrinsic motivation of individual to share knowledge. Accordingly, when nurses felt that they had a lot of freedom to control or able to exercise their job, they will share ideas and more knowledge with others and resulting in performing innovative behavior as well. Job autonomy increases nurses' sense of responsibility, so they may be willing to find or generate new ideas or solutions (Wu et al., 2014). In hospitals, nurses had adequate responsibility and was trusted by leaders, they could take control over their work activities and have the authority to make decisions to provide nursing care when they are satisfied with their autonomy. This would create a sense of responsibility and more importantly, a sense of ownership, because it enables nurses to not only perform their tasks, but also search and develop better ways to do these tasks (De

Spiegelaere et al., 2015; Lee, 2011). Therefore, job autonomy enhances the likelihood that nurses perform more behavior in the stage of idea generation (Wu et al., 2014). During the realization of new ideas, the generated idea should be supported. Job autonomy empowers nurses with the flexibility to manage their own time, resources and responsibilities. This leads to nurses having more power in controlling the outcome of their activities (Sazandrishvili, 2009).

Job title. There was no significant relationship between job title and innovative behavior of nurses in the present study (r = .07, p > .05; Table 4-4), There was no difference in innovative behavior experience between senior and junior nurses. This result does not support the results of previous studies that job title is positively correlated with innovative behavior and was contradictory with previous studies (Bao et al., 2012; Li, 2014; Lin & Guo, 2013; Wang, 2015; Zhu et al., 2014) which indicated a significant positive relationship between job title and innovative behavior. The possible explanation of these results may be that nurses lack the motivation to perform innovative behavior. In Autonomous Hospital, the P. R. China, the promotion of nursing job title focuses on the research ability rather than clinical ability (Du, 2012). Furthermore, there are no incentives for nurses to generate new ideas and improve their jobs. Nursing innovation was not viewed as an indicator of nurses' job performance. Some hospitals may occasionally organize nursing competitions to reward nurses, but it is not the best way to motivate nurses to perform innovative behavior in their daily work (Zhang, 2015). Nevertheless, even if innovative nurses generated new ideas, there may be a lack of financial and technical support. Some strategies did not adopt in Autonomous Hospitals, for example, special awards and funds of nursing innovation and the platforms to assist nurses to transfer new idea into products (Zhang, 2015). Although, there are senior nurses with long duration of working at Autonomous Hospital, the P. R. China, they have no encouragement to perform innovative behavior.

Educational attainment. There was no significant relationship between educational attainment and innovative behavior of nurses in the current study (r = .10, p > .05; Table 4-4). It means nurses who are diploma holders or bachelor's degree holders have no difference in experience of innovative behavior. This result was congruent with previous studies (Shih & Susanto, 2016; Wang & Ding, 2012; Yan & Shang, 2015; Zhu et al., 2014) which suggested educational attainment did not influence Chinese nurses' innovative behavior. However, the results were contradictory with previous studies by Liu et al. (2015) and Bao et al. (2013) which stated that nurses who obtained higher degrees would create more ideas and activities than nurses who had a low level of education. In Autonomous Hospital, the P.R. China, nurses who are diploma or bachelor's degree holders have the same job responsibilities to provide basic nursing care and have the same opportunities to contribute their ideas or knowledge into nursing or multidisciplinary teams (Xue & Li, 2010). Based on the rapid development of nursing education, the nursing undergraduate program focuses on nursing expertise and pays less attention on cultivating nursing students' comprehensive ability, including innovative ability and awareness (Li, Yu, Cheng, Zheng, & Cheng, 2012). This may lead nurses with bachelor's degree to not master more innovative knowledge than diploma holders. In addition, in clinical departments, nurses undertake the same nursing work, and every nurse can share their ideas and knowledge via the same channels, such as nursing meetings, consultations, communities and so on. This can stimulate nurses to generate new idea and solutions. Accordingly, there was no difference in innovative behavior between nurses who are diploma or bachelor's degree holders.

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