CHAPTER 2

Literature Review

For purpose of the study, the literature review included the following topics:

1. Innovative behavior
   - 1.1 Definitions of Innovative Behavior
   - 1.2 Conceptual Models of Innovative Behavior
   - 1.3 Measurements of Innovative Behavior
   - 1.4 Studies Related to Innovative Behavior
2. Factors Related to Innovative Behavior
   - 2.1 Job Title
   - 2.2 Educational Attainment
   - 2.3 Knowledge Sharing
   - 2.4 Job Autonomy
3. Situations Related to Innovative Behavior of Nurses in the P. R. China

Innovative Behavior

Definitions of Innovative Behavior

Innovative behavior has been studied by using different terms. While some scholars used innovative behavior (Scott & Bruce, 1994), some used innovation behavior (Tung, 2013), with others used innovative work behavior (Janssen, 2000). Therefore, in this study, the term "innovative behavior" was used.

Many scholars have defined innovative behavior from different perceptions. Farr and Ford (1990, as cited in Scott & Bruce, 1994) defined innovative behavior as an individual's behavior that aims to achieve the initiation and intentional introduction (within a work role, group or organization) of new and useful ideas, processes, products or procedures. Scott and Bruce (1994) defined innovative behavior a change process which begins with idea generation and culminates in successful implementation of the idea within the organization.

Janssen (2000) defined innovative behavior as "the intentional creation, introduction and application of new ideas within a work role, group or organization, in order to benefit role performance, the group, or the organization". Kleysen and Street (2001) defined innovative behavior as "all individual actions directed at the generation, introduction and /or application of beneficial novelty at any organizational level". In addition, Kheng, Mahmood and Beris (2013) defined innovative behavior as "an employee's action directed at the generation, application and implementation of novelty ideas, products, processes, and methods to his or her job position, departmental unit, or organization". Nurses' innovative behavior was defined as an act of seeking and developing new methods, techniques and work patterns, and introducing and applying the new idea into work (Bao et al., 2012).

Based on the above information, Bao et al.'s (2012) nurses innovative behavior definition was used in this study. Because the definition is specific to nurses. It is fit for nursing's work contents.

Conceptual Models of Innovative Behavior

Many previous studies work on innovative behavior focuses on the individual's creativity and the generation of idea, in other words, focus on the early stage of innovation process. There are also some researchers who identified innovative behavior as an act or a process.

According to Kanter's (1988, as cited in Kanter, 2000) model, Kanter stated that innovation is a multistage process and outlines the discrete tasks involved in innovation. The process includes (a) idea generation and activation of the drivers of the innovation; (b) coalition building and acquisition of the power necessary to move the idea into reality; (c) idea realization and innovation production, turning the idea into a model - a product or plan or prototype that can be implemented; (d) transfer or diffusion, the spreading of the model - the commercialization of the product, the adoption of the idea. The multistage process view indicates that some aspects of organizational innovation are clearly an individual level activities, beginning with idea generation at the first stage. However, individual level activities are not limited to this first phase.

Based on Kanter's (1988, as cited in Kanter, 2000) innovative behavior model, Scott and Bruce (1994) suggested the idea generation stage of the innovative process is seen as including ideas which are new to the organization and individual. Stage models of innovation (Kanter, 1988, as cited in Kanter, 2000) illustrate that the mix of activities required during the innovation process varies greatly from stage to stage. Innovation has a broad range of other types of behavior which combine to produce the final innovative outcome. Therefore, innovative behavior as complex behavior consisting of activities pertaining to both the generation/introduction of new ideas and the realization or implementation of a new idea. Scott and Bruce (1994) stated individual innovation begins with problem recognition and the generation of ideas or solutions, either novel or adopted. Next, an innovative individual seeks sponsorship for an idea and through coalition

building tries to gain support for it. Finally, the innovative individual contributes to idea implementation.

Kleysen and Street (2001) proposed five stages of individual innovative behavior, including opportunity exploration, generativity, formative investigation, championing and application. ***Opportunity exploring*** relates to individuals paying attention to opportunity resources in order to look for opportunities to innovate. ***Generativity*** refers to generating association and combination of ideas and information. ***Formative investigation*** refers to formulate, experiment and evaluate ideas and solutions. ***Championing*** means mobilizing resources, persuading and pushing participants to support the new ideas or solutions. ***Application*** refers to implementation of new ideas or solutions, after modifying, the new ideas or solutions would be routinized.

Based on Scott and Bruce's (1994) innovation model, De Jong and Den Hartog (2008) stated four stages of innovative behavior, including opportunity exploration, idea generation, championing, and application. Opportunity exploration includes looking for ways to improve current services or delivery processes or trying to think about work processes, product or services in alternative ways. Idea generation refers to generating concepts for the purpose of improvement. The generation of ideas may relate to new products, services or processes, the entry of new markets, improvements in current work processes, or in general terms, solutions to identified problems. Championing includes behaviors related to finding support and building coalitions, such as persuading and influencing other employees or management, and pushing and negotiating. Application behavior relates to the efforts individuals must put forth to develop an idea selected for implementation into a practical proposition.

In 2010, De Jong and Den Hartog reformed the four stages of innovative behavior and labelled them as idea exploration, idea generation, idea championing, and idea implementation. ***Idea exploration*** includes looking for ways to improve current products, services or processes or trying to think about them in alternative ways. ***Idea generation***

appears to be the combination and reorganization of information and existing concepts to solve problems or to improve performance. ***Idea championing*** focus on persons in informal roles who push creative ideas beyond roadblocks in their organizations and help realizing innovative ideas. ***Idea implementation*** also includes making innovations part of regular work processes like developing new products or work processes, and testing and modifying them.

Bao et al. (2012) developed Nurse Innovative Behavior Model based on literature, Kanter's (1988, as cited in Kanter, 2000) model and Scott and Bruce's (1994) innovative behavior model, in order to fit to Chinese nurses. The researchers stated three stages were involved in nurse's innovative behavior, namely idea generation, support obtaining and idea realization. ***Idea generation*** refers to the acts of identifying problems and generating ideas or solutions. The ideas or solutions can be original or existing. ***Support obtaining*** refers to the acts of seeking other people to support a new idea and solution while building a coalition. ***Idea realization*** refers to the acts of transferring a new idea into prototype or model, which can be touched or felt, and it can be produced on a large scale or institutionalized, therefore, generalizing to others.

Nurse innovative behavior model was developed based on two classical models, from literature, most models which related to innovation were developed based on the two models (Kanter, 1988, as cited in Kanter, 2000; Scott & Bruce, 1994), but Scott and Bruce (1994) did not identify the stages of innovation, Kanter's (1988, as cited in Kanter, 2000) innovation model might not be suitable for current situation. Compared to the two models, Bao et al.'s (2012) nurse innovative behavior model is more suitable for current situation of Chinese nursing innovation while focusing on nurse's "behavior", and it clearly states three stages to explain nurse innovative behavior. Therefore, this study used Bao, Wang and Zhang's innovative behavior model.

Instruments Measuring of Innovative Behavior

Innovative behavior has been measured by various instruments. Based on the literature review, the following instruments are commonly used to measure innovative behavior among workers.

Innovative Behavior Measure. This scale was developed based on innovation model by Scott and Bruce (1994). It is a unidimensional and 6-item scale which is rated on a 5-point Likert scale ranging from 1 (not at all) to 5 (an exceptional degree), and it was used to measure employee's innovative behavior. The sum of the questions is divided by the total number of items and is the individual's innovative behavior score. Higher scores indicate higher employee's innovative behavior. Some researchers suggested on a 6-point Likert scale, the mean score < 2.25 means a lowest level of innovative behavior, 2.26 - 3.50 means a lower level, 3.51- 4.75 means a moderate level, and > 4.67 means a high level of innovative behavior (Li, 2014; Lin & Guo, 2013; Wang & Ding, 2012). The Cronbach's alpha on this scale was .89.

Innovative Work Behavior Scale (IWB). Based on Scott and Bruce's (1994) innovation model, Janssen (2000) developed the Innovative Work Behavior Scale which involved three stages, including idea generation, idea promotion and idea realization, three items for each dimension. The 9-item IWB scale was completed by both the respondents (self-reports) and their supervisors (leader-reports). It was indicated how often employees performed those innovative work behaviors in the workplace. The response format was a 7-point scale ranging from 'never' (1) to 'always' (7). Janssen (2000) reported inter-correlations between the three stages of innovative work behavior ranged from .84 (between idea generation and idea realization) to .87 (between idea generation and idea promotion) for the leader-reports, and from .76 (between idea generation and idea realization) to .85 (between idea promotion and idea realization) for the self-reports. Cronbach's α was .95 for the self-rated and .96 for the leader-rated scores of IWB. A higher score indicated higher innovative behavior level.

Individual Innovative Behavior Questionnaire. This questionnaire was developed based on Kleysen and Street's (2001) innovative behavior model by Kleysen and Street (2001). Fourteen items are combined into the following subscales to measure individual innovative behaviors: opportunity exploration, generativity, formative investigation, championing, and application. Each item is evaluated using a 6-point Likert scale (1 = never, 6 = always). It was used among nurses in South Korea, the higher scores indicate greater levels of innovative behaviors. The inter-correlation of stages ranged from .68 to .76, and the Cronbach's alpha of each dimension ranged from .71 to .89, the Cronbach's alpha of overall scale was .95.

Nurse Innovative Behavior Scale (NIBS). Based on Nurse Innovative Behavior Model (Bao et al., 2012), Bao et al. (2012) developed this scale among Chinese nurses. It contains 10 items within three stages namely idea generation (3 items), support obtaining (3 items), and idea realization (4 items) on a 5-point Likert scale (1 = never, 5 = always). The researchers indicated higher scores means the more innovative behavior, but did not set the criteria to classify the level of innovative behavior base on score. The author tested the construct validity via factors analysis, the accumulated variance contribution rate was 72.01%. Test-retest coefficient ranged from .78 to .86. The correlation coefficient of each dimension ranged from .44 to .62, $p < .05$. The correlation coefficient of dimensions and overall score ranged from .78 to .87, $p < .05$. The content validity of scale was evaluated by 13 experts, the CVI was .91, CVI of each dimensions ranged from .88 to .95. The overall Cronbach's α was .88 and .75, .83 and .87 were for idea generation, support obtaining and idea realization respectively (Bao et al., 2013).

In summary, the Nurse Innovative Behavior Scale which was developed by Bao et al. (2012) was employed in this study. The scale was developed and tested for nurses' innovative behavior among Chinese nurses. All values of validity and reliability indicated the good psychometric properties of the instrument. It has been used to measure

innovative behavior by several researchers (Bao et al., 2013; Liu et al., 2015, 2016; Yang, 2015).

Studies Related to Innovative Behavior

Numerous studies related to nurses' innovative behavior have been conducted in western and eastern countries. A study which was conducted among 251 nurses in California indicated a moderate level of innovative behavior ($\bar{x}$ = 3.17) (Bunpin et al., 2016). The results of two studies which conducted in Vietnam (Tung, 2013) and Italy (Odoardi, 2014) illustrated a low level of innovative behavior of nurses ($\bar{x}$ = 2.36, SD = .36; $\bar{x}$ = 2.82, SD = .83, respectively).

In P. R. China, there are 11 studies explored nurses' innovative behaviour among tertiary hospitals. These studies indicated a moderated level of innovative behaviour (mean score ranged from 2.64 to 4.32) in Harbin (Li, 2014; Liu, 2014; Liu et al., 2015, 2016; Zhang & Wang, 2015), in Zhejiang (Lin & Guo, 2013; Zhu et al., 2014), in Tianjin (Wang & Ding, 2012; Wang, Ding, Yang, & Li, 2012), in Sahnghai (Bao et al., 2013), and in Shandong (Yang, 2015).

Previous studies showed the inconsistent results of nurses' innovative behavior among different countries. In P. R. China, almost studies showed a moderate level of innovative behavior as perceived by nurses. However, the results of Chinese studies showed the different mean score of innovative behavior of nurses. This might because that different strategies were adopted for nursing innovation in different cities or hospitals. For example, many hospitals in developed cities have conducted the nursing innovation competition, set nursing innovation funds, as well as set specific policy of nursing innovation in order to motivate and support nurses to perform more innovative behavior (Gao et al., 2016). However, Autonomous Hospitals in Dali conducted nursing competition once time in 2015. This may influence innovative behavior of nurses in autonomous

hospital. Therefore, it is necessary to study nurses' innovative behavior in different settings.

Factors Related to Innovative Behavior

Previous studies showed many factors influencing innovative behavior, such as conflict with co-workers, turnover intention (Janssen, 2003), transformational leadership style (Khan et al., 2012). Moreover, the relationships of innovative behavior with these four factors were found, including job title, educational attainment, knowledge sharing and job autonomy.

Job Title

Job title is a logogram of "the title of a technical or professional post" and it refers to the work position of a professional individual. Depending on the job, a job title can describe the level of the position or the responsibilities of the person holding the position (Doyle, 2016). In P. R. China, nurses job title contains five hierarchies: junior nurse, senior nurse, nurse in charge, assistant chief senior nurse and chief senior nurses (Health technical personnel proposed regulation, 2012). Assistant chief senior nurse and chief senior nurses work duties as nursing manager whereas senior nurse, nurse in charge and junior nurse, work duties as bedside nursing personnel. However, senior nurse and nurses in charge have similar responsibilities and different from junior nurse. The hierarchies of Chinese mainland nurses are quite different from other areas or countries. For instance, the study of Chang and Liu's (2008) in Taiwan showed work positions include registered nurse, registered professional nurse, head nurse and family planning nurses. The study of Knol and Van Linge's (2009) in Netherlands listed job positions in nurses as nurse, specialty nurse, nurse specialist, senior nurse and others. Therefore, this study used the term "job title", because it was a common term that was found in previous Chinese studies.

Job title is a key indicator to assess the professional skills of nurses in hospitals, and it reflects a nurse's experience, professional knowledge and skill levels, and

represents the ability of work and work achievements (Jia et al., 2012). Innovative behavior was viewed as an extra-role behavior (Jansson, 2000). Generally, senior nurses have a long duration of work, they may have more experience in innovation, while the incentive of organization stimulating them, they may perform more innovative behavior beyond their responsibility (Zhao & Wang, 2013). Moreover, senior nurses are usually the mainstay nurses in a team, they may be provided more opprtunities to learn new knowledge, once new idea was generated, more innovative behavior they may perform (Li, 2014; Wang, 2015).

The relationship between job title and innovative behavior existed in some previous studies. Bao and her colleagues (Bao et al., 2013) illustrated that job title was positively related to innovative behavior among 820 nurses which included junior (38.5%), senior (44.3%), assistant chief senior nurses and chief senior nurses (17.2%) ($F = 15.443$, $P < .001$). Lin and Guo's (2013) study found a positive relationship between job title and innovative behavior ($F = 10.275$, $p < .001$) among 226 nurses which included junior (36.8%), senior (59.4%) and assistant chief senior nurses (3.8%) in Zhejiang. Zhu et al. (2014) reported a positive relationship between job title and innovative behavior among 346 nurses which included junior (36.1%), senior (62.2%) and assistant chief senior nurses (1.7%) in Zhejiang ($F = 5.649$, $p < .01$). Li (2014) also found a positive relationship between job title and innovative behavior (beta = .072, $p < .01$) among 1185 nurses which included junior and senior nurses (84.9%), assistant chief senior nurse and chief senior nurses (15.1%) in Harbin. Wang (2015) described job title as an important predictor (beta = .191, $P < .05$) and the higher job title, the more innovative behavior was demonstrated among 690 nurses which included junior (37.0%), senior (55.1%), assistant chief senior nurse and chief senior nurses (7.9%) in Fuzhou. Yan and Shang (2015) reported a positive relationship between job title and innovative behavior ($F = 6.257$, $p < 0.01$) among 360 nurses which included junior (36.9%), senior nurses (63.1%) in Zhejiang.

In Summary, almost all previous Chinese studies reported the positive relationship between job title and innovative behavior. Although the nurses' job title were named by

the same terms, but due to there is no an exact national policy to guide the promotion of job title of nurses, there are some difference on promotion criteria among provinces, even among hospitals. Therefore, it is necessary to explore the relationship of job title and innovative behavior among nurses in Autonomous Hospitals, the P. R. China.

Educational Attainment

Educational attainment was defined as the highest level of education that an individual has completed (Census Bureau, 2016). The similar concepts were "Education" and "Level of education" in previous studies. In the P. R. China, educational levels of nurses include five categories: diploma program, associate degree, bachelor's degree, master's degree and doctoral degree (Deng, 2015).

There are some Chinese studies which have reported the relationship between educational attainment and innovative behavior. Bao et al. (2013) investigated innovative behavior among 820 nurses which include nurses with diploma (19.4%), associate (60.6%) and bachelor's degree (20%) in Shanghai and found educational attainment is positive related to innovative behavior ($F = 10.070$, $p < .01$). Li (2014) reported a positive relationship between educational attainment among 1,185 nurses which included nurses with diploma (25.6 %), associate (56.1 %) and bachelor's degree (18.3 %) in Harbin (beta = 0.089, $p < .05$). Liu (2014) also studied the relationship between organizational climate and innovative behavior among 1,208 nurses with diploma (27.6 %), associate (49.6%) and bachelor's degree (22.8 %)in Harbin and the results indicated a positive relationship between educational attainment and innovative behavior (beta = 0.102, $p < 0.05$). Liu et al. (2015) indicated the higher educational level the more innovative behavior among 682 nurses with diploma (1.6 %), associate (24.8 %), bachelor's (70.5 %) and master's degree (3.1%) in Harbin. Bao et al. (2013) stated during reforming of nursing in the P. R. China, the leaders expect the nurses who have obtained a higher degree to create more ideas and activities. Therefore, more opportunities were provided to them to learn new knowledge and develop skills. In addition, nurses with bachelor's degree usually master certain

management and research skills, they may undertake different nursing tasks than diploma and associate degree holders, thus they may obtain more opportunities to share and gain knowledge in different areas to generate idea (Xue & Li, 2010). Therefore, the nurses with higher educational attainment may perform more innovative behavior.

However, in P. R. China, the relationship between educational attainment and innovative behavior have shown inconsistent results. Some studies indicated there was no relationship between educational attainment and innovative behavior in Tianjin (Wang & Ding, 2012), in Zhejiang (Yan & Shang, 2015; Zhu et al., 2014). Since there are inconsistent results of the relationship between educational attainment and innovative behavior, it is beneficial to replicate and explore the relationship of educational attainment and innovative behavior in other provinces of the P. R. China.

Knowledge Sharing

Knowledge sharing has been defined by many researchers. Some scholars stated knowledge sharing refers to the willingness of individuals in an organization to share with others the knowledge they have acquired or created, through communication or indirectly (Gibbert & Krause, 2002, as cited in Neurink, 2013). Knowledge sharing refers to the degree to which one actually shares knowledge with others (Bock & Kim, 2002). Bartol and Srivastava (2002) defined knowledge sharing as individuals sharing organizationally relevant information, ideas, suggestions, and expertise with one another. In another perception, knowledge sharing refers to the behavior of disseminating one's acquired knowledge with other members within one's organization (Ryu & Han, 2003). Yi (2009) defined a set of individual behaviors involving sharing one's work-related knowledge and expertise with other members within one's organization, which can contribute to the ultimate effectiveness of the organization. Then, Shaari, Bakri, and Rahman (2015) defined knowledge sharing as peoples' behavior or the action of either sharing or not sharing their knowledge with others as in donating or collecting knowledge. Knowledge sharing was defined as a process by some researchers. Chua (2003) pointed out that

knowledge sharing is a process in which individuals collectively and iteratively share their thoughts, ideas or suggestions based on experiences. Van den Hooff and de Ridder (2004) defined knowledge sharing is the process where individuals mutually exchange their implicit and explicit knowledge and jointly create new knowledge. Sharing involves two central processes, i.e. knowledge donating (communicating to others what one knows) and knowledge collecting (consulting others in order to learn what they know).

Yi's (2009) knowledge sharing definition was used in present study. Since this definition specific to individual's behavior and indicated the knowledge should be work-related knowledge. It is more suitable than other definitions.

Based on Bartol and Srivastava's (2002) knowledge sharing model, Yi (2009) stated that there were four channels which an individual uses to share their knowledge in organizations. These include written contributions, organizational communications, personal interactions, and communities of practice. ***Written contributions*** means behaviors of employees' contributing their ideas, information, and expertise through written documentation rather than dialog. Such as by posting ideas to organizational database and submitting reports which can benefit other employees and the organization, through the person-to-document channel. ***Organizational communications*** means behaviors of sharing knowledge in formal interactions within or across teams or work units. For example, working teams or project groups may have regular meetings for brainstorming or problem solving by seeking ideas from employees. Knowledge is shared through formal social interactions of a person-to-group channel. ***Personal interactions*** means behaviors of sharing knowledge in informal interactions among individuals such as chatting over lunch and helping other employees who approach them. Knowledge is shared through the informal social interactions of a person-to-person channel. ***Communities of practice*** means behaviors of sharing knowledge within communities of practice, which are voluntary groups of employees communicating around a topic with common interests in a non-routine and personal way, knowledge is shared through informal social interactions of a person-to-group channel. Yi's knowledge sharing model

(2009) was used in this study due to it focuses on individual behaviors and via documents, communications and voluntary groups to share knowledge, compared with other models, it covers four channels which can be used to share knowledge, thus, it is more complete. In addition, it has been used in Chinese nursing area.

Yi (2009) also developed a scale based on Yi's knowledge sharing behavior model to measure the four behaviors of knowledge sharing, namely Knowledge Sharing Behavior Scale (KSBS). It consists of 28 items measuring four dimensions of knowledge sharing behavior namely written contributions (5 items), organizational communications (8 items), personal interactions (8 items), and communities of practice (7 items). On a five-response choice frequency scale, the total score of this scale ranges from 28 to 140. A higher score means a performance of more innovative behavior. This scale was tested among employees in the U.S. The results showed that the KSBS is a well-developed instrument with sufficient evidence of its dimensionality, reliability, and validity. The overall reliability was .73 and the reliability of each dimension ranged from .506 to .939.

Chen and Wu (2015) translated and modified the Knowledge Sharing Behavior Scale (Yi, 2009) in order to fit to Chinese contents and called it the "Chinese Knowledge Sharing Behavior Scale". This scale contains 4 dimensions, 4 items for written contribution, 5 items for organizational communication, 5 items for personal interaction and 5 items for communities of practice for total 19 items on a 5-point Likert scale. The higher score indicates more knowledge sharing behavior. The researchers translated and modified the scale and followed the procedure "Translation - Back translation - Cultural adapted - Pilot study". Then, the authors (Chen et al., 2016) tested the validity and reliability among 364 clinical nurses and the results showed the CVI of overall scale was 0.931 and for each dimension range from 0.882 to 1.000. The correlation coefficient of dimensions and overall scale ranged from 0.753 to 0.884 ($p < 0.01$). The KMO of scale is 0.932. The Bartlett test of Sphericity $X^2 = 3442.848$ ($p < 0.01$) indicated it was suitable for factors analysis. The Cronbach's alpha of overall scale was 0.923 and ranged from 0.727 to 0.921

of each dimension. The Guttan Split- Half of overall scale was 0.797 and ranged from 0.662 to 0.855 of each dimension. In factors analysis, 4 factors were exacted. The cumulative variance is 67.253% and each item on relevant factor has enough strength of load. Those results indicated the satisfactory validity and reliability of the scale.

In this study, the Chinese Knowledge Sharing Behavior Scale (Chen & Wu, 2015) was employed. Because the original English version scale (Yi, 2009) was developed based on a classic model and has been used to measure nurses' knowledge sharing behavior in western country (Li, Paunova, & Egerod, 2016). The Chinese version scale has been used to measure Chinese nurses' knowledge sharing behavior, the results indicated the scale has satisfactory validity and reliability and is an appropriate fit for Chinese contents.

The relationship between knowledge sharing behavior and innovative behavior was found in some previous studies. Kim and Park (2015) studied the relationship between knowledge sharing and innovative behavior based on individual and organizational characteristics among 347 register nurses in South Korea. A 9-item knowledge sharing questionnaire (Bai & Lee, 2005, as cited in Kim & Park, 2015) and innovative behavior questionnaire (Kleysen & Street, 2001) were used. The researchers found that more individual knowledge sharing was associated with more individual innovative behaviors. Individual knowledge sharing had a positive total effect on individual innovative behavior (beta = 0.406, $P < 0.05$).

Some researchers described idea generation is a process of knowledge creation that requires to combine internal and external knowledge into new forms (Popadiuk & Choo, 2006). During idea promotion, individuals should "translate" a new idea into a form that is understandable and palatable for other individuals and teams. Finally, during idea implementation, individuals coordinate and integrate different sets of knowledge with other individuals or teams, so that the innovation can be routinized (Howell & Sheab, 2001). For example, Radaelli et al. (2014) presented a micro-level investigation that provides new insights into how employees' knowledge sharing affects their own

innovative behaviors among 155 employees (including nurses) in four Italian palliative care organizations by using 4 items adapted from Janssen's (2000) innovative work behavior scale and 4 items adapted from Daft's (2001) and Wasko and Faraj (2005)'s knowledge sharing questionnaires (as cited in Radaelli et al., 2014). The findings indicated knowledge sharing had a direct effect on innovative behavior ($\beta = 0.303$, $P < 0.01$). Jaberi (2016) examined the impact of the knowledge sharing on innovative behavior among 279 hospital employees (including nurses) in Iran by using innovative behavior measurement (Kanter, 2000) and knowledge sharing measurement adapted from Bennett and Gabriel's (1999, as cited in Jaberi, 2016) knowledge management scale. The results showed knowledge sharing has a positive and meaningful effect on innovative behavior ($r = 0.474$, $p < 0.01$).

Li et al. (2016) investigated the influence of knowledge sharing behavior and innovative behavior among 200 ICU nurses by using three dimensions (namely written contributions, organizational communication and personal interaction) which were adopted from Yi's (2009) knowledge sharing behavior scale and a subscale of the Role-Based Performance Scale (Welbourne, Johnson, & Erez, 1998) to measure innovative behavior in Denmark. The researchers considered nurses communicate with others for sharing knowledge and experience through formal and informal way. By engaging in these knowledge sharing activities, it is expected that nurses may become more innovative in general. The results of this study showed knowledge sharing through written contributions ($b = 0.37$, $p < 0.01$), organizational communication ($b = 0.41$, $p < 0.01$) and personal interaction ($b = 0.20$, $p < 0.05$), were positively related to innovative behavior. The Cronbach's alpha of the three knowledge sharing dimensions ranged from 0.69 to 0.86.

Wang and Ding (2012) studied the correlation among organizational support, knowledge sharing and innovative behavior among 420 nurses by using Scott and Bruce's (1994) innovative behavior measures and donating and collecting scales (Hooff & De

Ridder, 2004) to measure innovative behavior and knowledge sharing behavior respectively in Tianjin, the P. R. China. The researchers stated innovation is a process of donating and collecting knowledge. The knowledge which nurses have already mastered is the foundation for engaging in innovation, knowledge sharing provides a channel for nurses to obtain knowledge quickly which is needed in innovation. The results displayed knowledge donating ($r = 0.463$, $p < 0.01$) and collecting ($r = 0.450$, $p < 0.01$) scores positively associated with innovative behavior and both the two processes were the predictors of innovative behavior.

Yu, Yu, and Yu (2013) investigated the relationship between individual knowledge sharing and innovative behavior among 430 employees in Taiwan, the P. R. China by using Janssen's (2000) innovative work behavior scale and 6 items adapted from previous studies (Bartol & Srivastava, 2002; Fong & Wu, 2007; Huang & Tsai, 2003, as cited in Yu et al., 2013) to measure innovative behavior and knowledge sharing behavior respectively. The researchers indicated knowledge sharing could stimulate an organization to create knowledge. When employees are more involved in knowledge sharing, they internalize a greater amount of knowledge. Such conditions might be beneficial for increasing innovative behavior. Innovation is influenced by cognitive ability, character, knowledge, inner motives, and social networks. Faster knowledge transfer through sharing helps cultivate the ability to think and create. The findings of this study demonstrated knowledge sharing created significant effects on employees' innovative behavior ($r = 0.512$, $p < 0.001$).

Kim and Lee (2013) inspected the relationship between knowledge sharing processes (knowledge collecting and donating) and employee service innovative behavior among 418 hospitality employees in Korea by using 6 items scale (Hu, 2009, as cited in Kim & Lee, 2013) which was modified based on Scott and Bruce's (1994) innovative behavior measure and knowledge donating and collecting scales (Van den Hooff & Hendrix, 2004). The authors specified that knowledge sharing occurs when an individual

is willing both to learn and assist others in developing new capabilities (Bock and Kim, 2002). According to Van den Hooff and De Ridder (2004), knowledge sharing is a process of communication between two or more participants involving the "acquisition" and "provision" of knowledge which means it consists of both the supply of new knowledge and the demand for new knowledge. The results of this study revealed both the two knowledge sharing processes positively associated with employees' service innovative behavior, knowledge collecting ($\beta = 0.496$, $p < 0.01$), and knowledge donating ($\beta = 0.477$, $p < 0.01$).

Although some studies supported the relationship between knowledge sharing behavior and innovative behavior, there is a study which reported an inconsistent result. Yesil and Hirlak (2013) suggested knowledge sharing processes (knowledge collecting and donating) did not influence individual innovative behavior. This study was conducted to identify barriers and their impact on knowledge sharing and individual innovative behavior among 230 academics in Turkey. A 7-item scale and 4-item scale which were taken from previous studies (Van Den Hooff & De Ridder, 2004; Lin, 2007, as cited in Yesil & Hirlak, 2013) were used to measure knowledge donating and knowledge collecting, as well as 9 items were taken from De Jong and Hartog's (2008) scale to measure innovative behavior.

In conclusion, knowledge sharing provides platforms and opportunities for nurses to gain knowledge from others, it can promote nurses to generate new ideas or solutions. Via the formal and informal ways communication with co-workers and leaders, the innovative nurse may obtain sufficient supports from others. During the final stage, the innovative nurse and supporters may work together in a voluntary group in order to practice the new idea and solution. There are several studies have been done to explore the relationship between knowledge sharing and innovative behavior in different professions, but showed the inconsistent results. In addition, only one study has been done in the P. R. China and the finding of Tianjin may not be generalized into all health care

settings in the P. R. China. Thus, more studies should be conducted to explore the relationship between knowledge sharing and innovative behavior among nurses.

Job Autonomy

The terms of "job autonomy" and "work autonomy" can be used interchangeably. Thus, in this study, the term of "job autonomy" will be used. Job autonomy has been defined by numerous researchers. The most common definitions of job autonomy is formulated by Hackman and Oldham (1975) and Ganster (1989). They defined job autonomy as "the degree to which the job is provided by substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out". Breaugh (1985) defined job autonomy as the degree of control or discretion that a worker is able to exercise with respect to method, scheduling and criteria of work facets. Another researcher stated job autonomy in the organization can be define as "a physical performance, or set of practices relating the allocation of responsibility and produce the chain of command so as to give employees greater than before decision-making power in respect to the implementation of their main work activities" (Leach et al., 2003, as cited in Rizwan et al., 2014). Breaugh's (1985) job autonomy definition was used in present study. Based on Hackman and Oldham's (1975) definition, Breaugh viewed job autonomy as an independent concept, deleted the concept "independence", as well as added a work facet "criteria" into this definition. It is more specific and complete than other definitions.

Job autonomy was introduced firstly as a dimension of Job Characteristics model (Sims, Szilagyi, & Keller, 1976) and Job diagnosis model (Hackman & Oldham, 1975). However, job autonomy as the core job dimensions in these two models, but some scholars doubted about these two sub-dimensions, such as they concerned if study a such complex concept by using a simplified broad index it would mask more than it revealed, they considered job autonomy should be studied as an independent concept (Kiggundu, 1983; Vroom, 1964, as cited in Breaugh, 1985). As well as they questioned on the validity,

reliability and complex responds of the two subscales (Breaugh, 1985). In order to deal with those problems, Breaugh (1985) separated job autonomy from Job diagnosis scale (Hackman & Oldham, 1975) and developed a model to explain job autonomy. The model was consisted of method autonomy, scheduling autonomy and criteria autonomy. ***Method autonomy*** is "the degree of discretion/ choice individuals have regarding the procedures (methods) they utilize in going about their work"; ***Scheduling autonomy*** is "the extent to which workers feel they can control the scheduling/sequencing/timing of their work activities"; and ***Criteria autonomy*** is "the degree to which workers have the ability to modify or choose the criteria used for evaluating their performance". Breaugh's work autonomy model was used in present study, as this model was developed for particular job autonomy concept and present the three aspects of job autonomy clearly.

Breaugh (1985) developed the Work Autonomy Scale to measure three facets of job autonomy (method, scheduling and criteria autonomy). It consists of nine items (three items for each facet) and is answered on a 7-point response scale. Breaugh and Becker conducted five studies (Breaugh, 1985, 1989; Breaugh & Becker, 1987) in order to provide evidence to support validity and reliability of this scale. In 1985, the results of a study (N = 97) revealed the means of method autonomy, scheduling autonomy and criteria autonomy were 5.04, 5.23, 3.60 respectively, and SD were 1.53, 1.20 and 1.38. The retest reliability were 0.76, 0.71 and 0.65 respectively. The results of a study (N = 312) reported the means of method autonomy, scheduling autonomy and criteria autonomy were 5.13 (SD = 1.30), 4.67 (SD = 1.35) and 3.77 (SD =1.39). In 1987, Breaugh reported method autonomy (mean = 5.60, SD = 1.27, Cronbach's α = 0.90), scheduling autonomy (mean = 5.52, SD = 1.54, Cronbach's α = 0.88) and criteria autonomy (mean = 4.11, SD = 1.69, Cronbach's α = 0.89) among 93 MBA students in the US. As well as reported mean scores of method autonomy, scheduling autonomy and criteria autonomy ranged from 4.13 to 5.35, SD ranged from 1.35 to 1.60, the Cronbach's α is 0.91, 0.85 and 0.78 respectively among 9,421 employees. In 1999, among 133 undergraduate business students, Breaugh

reported method autonomy (mean = 4.79, SD = 1.64, Cronbach's α = 0.93), scheduling autonomy (mean = 4.73, SD = 1.65, Cronbach's α = 0.88) and criteria autonomy (mean = 3.68, SD = 1.65, Cronbach's α = 0.85). The correlation of three dimensions ranged from 0.57 to 0.72 (Breaugh, 1989).

In brief, the scale developers tested validity of Work Autonomy Scale via confirmatory factor analyses and sub group comparison. The results indicated the good validity and reliability of the scale. Through factor analysis, coefficients of congruence for the respective factors of two samples are greater than 0.93. Tested with Hackman and Oldham's Scale, the average correlation between the three facet measures was 0.37. Internal consistencies ranged from 0.77 (criteria autonomy) to 0.97 (method and scheduling autonomy). Test-retest reliabilities ranged from 0.65 to 0.76 (one study, 1- month time interval). Three studies which used work autonomy scale to measure nurses' job autonomy and showed the Cronbach's αranged from 0.78 to 0.88 (Lin, 2012; Nwankwo, Kanu, Obi, Aboh & Agu, 2013). In this study, work autonomy scale (Breaugh, 1985) was used. The scale was developed in order to deal with some researchers' questions, it is specified to job autonomy, shows the satisfied validity and reliability and it has been used to measure nurses' job autonomy.

From the literature review, these studies were found to explore the relationship between job autonomy and innovative behavior. Zhu et al., (2014) investigated the effect of psychological empowerment on the innovation behavior among 346 nurses in a tertiary hospital, Zhejiang province, the P. R. China by using a subscale (3 items) of psychological empowerment scale (Sprietzer, 1995) and innovative behavior measure (Scott & Bruce, 1994) to measure job autonomy and innovative behavior respectively. The results indicated job autonomy had a significant positive relationship with innovative behavior (r = 0.477, p = 0.018).

De Spiegelaere et al. (2015) explored the problem of how to promote the engagement of employees in their work and boost their implication in the innovation process among

3,098 employees in Belgium. A combined scale picked up items from Scott and Bruce's (1994) measure, Janssen's (2000) and De Jong and Den Hartog's (2010) scale to measure innovative behavior and used the Dutch 'VBBA' survey (Van Veldhoven et al., 2002, as cited in De Spiegelaere et al., 2015) to measure job autonomy. The researchers noted job autonomy gives employees (a sense of) control over how they do their work which enables them to find and develop fitting ways to perform the work tasks. As a consequence, the employees will not only do a better job, but will also try to be more creative and innovative. Innovative behavior is all about experimenting with different alternatives in order to find a new, better fitting approach. Autonomy over work processes is therefore crucial for employees to be able to demonstrate innovative behaviors. The results of this study showed job autonomy is positively related to innovative behavior ($\beta = 0.165$, SE = 0.017).

De Spiegelaere et al. (2014) examined the relationship between job autonomy and innovative behavior among 927 Flemish workers by using a 9-item scale (De Jong & Den Hartog, 2010) and 4 items adapted from 'Nova-Weba' survey (Schouteten & Benders, 2004 cited in De Spiegelaere et al., 2014) to measure innovative behavior and job autonomy respectively. The researcher stated autonomy enables employees to experiment with different work approaches and methods. It enables them to find ideas and develop them further through the small-scale application of these ideas. Moreover, research also found that in jobs with a lot of autonomy, employees tend to participate more in knowledge sharing. The results showed job autonomy is positively related to innovative behavior ($\beta = 0.16$, SE = 0.03).

Wu et al. (2014) proposed the need for cognition as an antecedent of innovative behavior among 179 employees in Holland. 3 items were taken from Scoot and Bruce's (1994) innovative behavior measure and 6 items were taken from Morgeson and Humphrey's (2006) Work Design Questionnaire to measure innovative behavior and job autonomy respectively. The authors stated job autonomy improves individuals' felt

responsibility and ownership at work as well as their breadth of understanding and perspective taking. Job autonomy also can facilitate incremental learning the development of expertise and individuals' control beliefs to bring change. Therefore, these mechanisms enhance the likelihood that employees will engage in the generation and pursuit of ideas. The results showed a positive correlation between job autonomy and innovative behavior ($r = 0.40$, $p < 0.01$).

Hammond, Neff, Farr, Schwall, and Zhao (2011) conducted a meta-analysis on predictors of individual-level innovation at work. The researchers noted jobs with little discretion in how, when, or where work is accomplished may stifle an employee's ability to be innovative. Alternatively, providing employees with sufficient freedom to determine which procedures should be used to carry out a task may increase the likelihood that they will be willing to implement them within their job. Autonomy is positively correlated with innovative behavior ($p = .32$).

Sazandrishvili (2009) investigated the relationship between job autonomy and innovative behavior by using Kwakman's scale (1999, as cited in Sazandrishvili, 2009) and the innovative behavior scale (De Jong & Den Hartog, 2010) to measure job autonomy and innovative behavior respectively among 456 teachers in Holland. The researcher stated job autonomy provides power and more opportunities to employees to determine the frames of the job they are implementing. Valuing and dedicating their activities and outcomes can stimulate the willingness to improve the established processes and bring something new. This can be the basis of generating novel and useful ideas. During implementation of a new idea, the generated idea should be supported and realized in order to accomplish the innovative process (Scott & Bruce, 1994). Autonomous people are empowered with the flexibility to manage their own time, resources and responsibilities. They are more forced towards self-organizing behavior and they have more power in controlling the outcomes of their activities. This might promote the perception that they

are the managers and supporters of their activities. The results revealed a significant relationship ($\beta = 0.16$, $p < 0.01$) between job autonomy and innovative behavior.

Ramamoorthy et al. (2005) developed a causal model to predict innovative behavior among 204 employees in Ireland by using innovative work behavior scale (Janssen, 2000) and a self-designed scale to measure innovative behavior and job autonomy respectively. The researchers regarded autonomy as a permit for employees to contribute to 'trial and error' and find more efficient and effective methods of doing their work. Since innovation involves trial and error, and successes and failures, job autonomy provides employees with an avenue to experiment new ideas even in the face of failure. Autonomy eliminates the need for the employees to work within a prescribed set of bureaucratic rules and regulations. Furthermore, autonomy has also been shown to be one of the critical components that employees have come to expect from their employment (Herriott et al., 1997 cited in Ramamoorthy et al., 2005). Perceptions of autonomy in their work may also influence the extent to which an employee may want to engage in innovative work behaviors (obligation to innovate) and also on the behavior itself. The findings of this study showed job autonomy had a direct effect ($r = 0.57$, $p < 0.001$) on innovative behavior.

De Naeyer (2011) investigated the relationship between innovative behavior and job autonomy among 445 employees via internet, Janssen's innovative work behavior scale (2008) and 3 items which were taken from VBBA research (Van Veldhoven & Meijman, 1994, as cited in De Naeyer, 2013) were used to measure innovative behavior and job autonomy respectively. The finding showed a positive relationship between innovative and job autonomy ($r = 0.34$, $p < 0.01$).

Dhar (2016) explored the correlation between service innovative behavior and job autonomy among 428 employees in India. Innovative behavior scale (Hu, Horng, & Sun, 2009 cited in Dhar, 2016) which was modified from Scoot and Bruce's scale (1994) was used to measure service innovative behavior, and a 4-item scale from (Park and Searcy,

2012 cited in Dhar, 2016) was used to measure job autonomy. The results indicated a positive correlation between service innovative behavior and job autonomy ($r = 0.654$, $p < 0.01$)

Johana (2013) investigated the relationships among organizational culture, worker autonomy and employee innovativeness among 193 employees in Ghana, Africa. Breaugh's work autonomy scale (1989) was used to measure employees' job autonomy as well as a 13- items scale (George & Zhou, 2001) which combined the Scott and Bruce (1994) innovative behavior measure and the researcher designed scale to measure employee innovativeness. The findings showed a positive relationship between workers' job autonomy and innovative behavior ($r = 0.256$, $p < 0.05$).

In conclusion, Job autonomy gives nurses freedom to determine when and how to carry on their work. Method autonomy allows nurses to decide which methods they will use to deal with the problems. More freedom enables nurses to feel more of a sense of responsibility and ownership. Nurses may be willing to improve their work, be more efficiency, and actively engage in, seek out and generate new ideas. Meanwhile when nurses are allowed scheduling autonomously, they can arrange their time or sequence of work more reasonably. There are several studies which have been explored the relationship between job autonomy and innovative behavior, but only one study has been conducted among nurses in the P. R. China by using a subscale which has been questioned on its validity and reliability by some scholars (Kiggundu, 1983; Vroom, 1964, as cited in Breaugh, 1985). Therefore, it is beneficial for exploring the relationship among Chinese nurses.

Situations Related to Innovative Behavior of Nurses in The P. R. China

The P. R. China is a big country located in East Asia, with a huge population approximates to 1.37 billion up to 2014 and the land area of 9.6 million square kilometers (National Bureau Statistic of China, 2014). According to National Health and Family

Planning Commission of the P. R. China, at the end of July, 2016, there are 28,341 hospitals including 2175 tertiary hospitals. Classified by economy, there are 12,871 public hospitals and 15,470 private hospitals. The private hospitals increased more than 2,115 in 2015. At the end of 2015, the number of nurses was 3,241,000 while the ratio of nurse to population was 2.36: 1000. Meanwhile, this ratio was different in different areas. For instance, the ratio was 5.3: 1000 in Beijing, but in Guizhou and Yunnan it was 1.4: 1000 and 2.05:1000 respectively. The ratio was quite lower than America (9.8:1000), Japan (11.49:1000) even the standard of European Union (8:1000). Therefore, a nursing shortage is still a huge challenge in the P. R. China.

Based on the function of health care organizations, hospitals are classified into three categories with certain criteria (Ministry of Health of China, 1989). The primary hospital which services community population. It has less than 100 beds, and is responsible for disease prevention, medical service, healthcare and rehabilitation. The secondary hospital which services multi-communities. It has 101-500 beds and takes responsibility for healthcare services, teaching and scientific research. The tertiary hospital which serves the whole city, province or country with more than 501 beds, take responsibility of high level special medical services, medical education and scientific research.

Economically, there are two types, public and private hospitals. The characteristics of public hospitals are commonweal, multilayered, non-profit and provide medical service. Although, non-profits have been emphasized and financial investment is put into the operation of health care organizations, but the financial investment from the government is not enough to support hospitals. From 2002 to 2009, the financial investment from the government ranged from 5.98% to 7.49% as the average income of all general hospitals (Ben, 2011). Approximately 92% financial income should be earned by hospitals themselves.

According to the Central People's Government of the P. R. China (Chinese Overview, 2009), a four-level administrative subdivision is running in the P. R. China, including the first-level administrative subdivision (e.g. province-level division), prefecture, country and township level divisions. The autonomous prefecture belongs to prefecture-level division. According to Law of the People's Republic of China on Regional National Autonomy (1984), Autonomous prefectures were classified based on the number, culture and customs of minority citizens, there are thirty one autonomous prefectures were set up nationwide. The central government allows the local government to set up regulations which is based on national regulations and should be suitable for minority customs. The local government also has the rights to manage the finances by themselves. Minority citizens have prior rights to be the leaders in public organizations. Hospital which is Autonomous Prefecture- level, can be secondary or tertiary hospital. Therefore, Autonomous Prefecture Hospital not only meets the criteria of secondary or tertiary hospital, but also has obligation to provide special services to minority and has rights to set regulations of administration based on the characteristics of minority (Personal communication, 2016)

Yunnan is located in southwest of the P. R. China. It is a developing economic province with 394 thousand square kilometers, accounting for 4.10% of China's area. According to Yunnan Provincial Bureau of Statistics (2016), at the end of 2015, there were 1,101 hospitals, 236,000 beds, and they provided health care service to 47.42 million residents. The average GDP of the population was $4,350, which was lower than the national average GDP. At the end of 2014, there were 110,000 registered nurses and the nurse to population ratio was 2.05: 1000 which is lower than National standard with 2.20: 1000 (National Health and Family Planning Commission the People's Republic of China, 2015). There are 82 universities that have the ability for culturing master's nursing students in the whole country, but in Yunnan province only two universities have master's degree program (New Oriental Web, 2016). It might reflect the low level of nursing staffing, economic and education in this province. A study stated that the total innovative ability

in some provinces, including Yunnan, were the lowest compared with other provinces which are located in the western areas of China. The author considered that because of the weak economic basis, lack of resources and financial investment, less education and techniques are evidenced in this area (Dai, 2007).

According to geographic location, there are 4 areas in Yunnan province, including middle, western, southern and eastern areas. At the end of 2015, there are 32 tertiary hospitals in Yunnan province, including 15 tertiary hospitals are located in the middle area, and responsible for 8,970,000 people's medical service, 5 tertiary hospitals are located in the western area and responsible for 9,860,000 people's medical service. In addition, the nurse to population ratio was 4.21 in Kunming (middle area), but in the western area, the ratio was 1.95, 1.8 and 1.72, in Chuxiong, Dali and Dehong autonomous prefectures, respectively (Yunnan News, 2016). Thus, nurses who work in the western area tertiary autonomous prefecture hospitals may have higher workload than nurses who work in middle area.

Recently, an increasing number of hospitals' directors realized the importance of nursing innovation. Some strategies were adopted to encourage nurses perform more innovative behavior. For example, innovation competitions regard to nursing service, object, clinical education and process were organized in some hospitals. In Anshan, a city of Liaoning province, the Nursing Association organized a competition in innovation among all nurses in this city (Ba, 2016). As well as several hospitals organized the first time nursing innovation competition in 2016 (Tian, 2016; Wang & Tian, 2016; Wang, 2016). Even in Dali Bai Autonomous Prefecture People's Hospital, one time nursing innovation competition was conducted in 2015. This did motivate nurses to perform more innovative behavior during a short time. But there is no a long-term incentive mechanism may not encourage nurses perform innovative behavior in daily work. For instance, in Shiyan hospitals, Hubei province, a policy specified to nursing innovation was implemented for guiding and motivating nurses to perform innovative behavior (Nursing new techniques and projects management regulation, 2015). Nevertheless in Autonomous

Hospitals, there is just only one regulation is enacted to guide the management of all new techniques and projects (Zhou & Liu, 2006). However, once the nurses have innovated a new project or process, the hospital might support them to apply for a patent (Chen et al., 2015), for example, there was less activities conducted for motivating nurse' innovative behavior in Dehong Dai and Jingpo Autonomous Hospital, but there are 6 cases of nursing patent by the end of 2016 (Personal communication, 2017). This may be a way to motivate nurse to innovative.

Zhao and Wang (2013) analyzed the main reasons of Chinese nurses' not well performance in innovative behavior may be that nurses lacked of ability to conduct research, communication and self-study, and nursing managers lack of transformational leadership and sufficient supports to staffs. Wang (2015) found the work environment would impact nurses' innovative behavior and the nurses who work in tertiary hospitals act more innovative behavior than who worked in primary and secondary hospitals. In addition, a majority of nurses in Chinese hospitals provide nursing care still based on empiricism, habitual thinking and following doctor's orders (Wang, Li, & Mu, 2015). Those phenomena may influence nurses' innovative behaviors and innovation development in nursing work.

In the P. R. China, the nurses' job titles are different from other countries'. According to Ministry of Health of China (1989), nurses' job title is divided into 5 categories as below: junior nurse, senior nurse, nurse in charge, assistant chief senior nurse and chief senior nurses. Nurse is the lowest position while chief senior nurse is the highest position. According to "Health technical personnel proposed regulation"(2011), the standards of the five categories of job titles are concluded briefly as below: junior nurse – who obtained Chinese nurse license, master the basic nursing skills and provide general nursing care to patients in clinical department; senior nurse – who graduated from technical secondary school with 5-year work experience in clinical department or obtained associate/bachelor's degree with 2/1-year work experience in clinical department. Senior nurses are responsible

for providing some difficult nursing skills, guiding nurses' work and participating in nursing research; nurse in charge - bases on senior nurse, educational attainment and year of work experience, participating in nursing management within clinical departments; assistant chief senior nurse and chief senior nurse have a main responsibility as similar to nurse manager.

The nurses' job titles are promoted according to nurses' research ability, educational attainment, years of work experience, English and computer abilities, the number of published articles, and clinical ability (Du, 2012). Promotion of job title means salary increases which motivates nurses, and improves quality of nursing care and service (Cao, 2006). Meanwhile, the promotion of nurses' job title is viewed as competition with the limited number is provided to nurses, this lead to although a nurse met all criteria of higher job title, but she may not obtain this higher job title, this lead to some nurses' nursing ability is higher than the relevant job title required (Du, 2012). In Autonomous hospitals, the percentage of nurses with higher job title is quite lower than the previous studies, for example, in Dali Bai Autonomous Hospital, the percentage of nurses with assistant chief senior nurse was 2.7% in 2016, and there was no chief senior nurse in clinical departments.

There are five nursing educational levels in the P. R. China: diploma, associate, bachelor's, master's and doctoral degrees. The diploma, associate and bachelor's degree programs focus on culturing students' clinical nursing skills with a few knowledge about nursing education. Nursing management and research was added into the curriculum of undergraduate program. Master's degree and doctoral degree program focus on nursing management and research deeply (Deng, 2015). However, the majority of nurses who received master's or doctoral degrees would not work in clinical departments or hospitals, they preferred to be the nursing educators in colleges or universities (Zhang, Liu, & Xie, 2010).

According to National Health and Family Planning Commission of China demands, in respect to the tertiary hospitals, at least 50% nurses should obtain associate degree (Dong, 2015), and a report indicated the percentage of nurses who obtained associate degree and above is 62.5% (Xinhua News Agency, 2016). Up to August, 2016, in Dali Bai Autonomous Prefecture People's Hospital, the percentage of nurses' educational attainment was 26.1% of diploma, 45.9% of associate degree and 27.6% bachelor's degree. However, the percentage of nurses who obtained associate and bachelor's degree is more than the national average standard, but no nurses obtained master's and doctoral degree in this hospital. In recent years, many hospitals implement "Nurse hierarchical management system" (Lu, 2015), instead of that nurses, no matter which level of education, undertake the same clinical work in clinical nurses (Fang, 2007). In Autonomous Hospitals, it is at the beginning of the implementation of Nurse hierarchical management system, nurses with bachelor's degree still have to focus on providing basic nursing care because of nursing shortage. This situation may impact nurses' innovative behavior.

However, knowledge management is very popular in western countries' nursing area, but in the P. R. China, the majority of hospitals implement knowledge sharing instead of knowledge management. Knowledge can be shared via internet, documents, individuals and groups (Yi, 2009). Since 2005, Hospital Information System has been commonly used in all tertiary hospitals, but most hospitals cannot utilize it sufficiently to share nursing knowledge and focus on management of medical records (Chen et al., 2016). However, fewer hospitals utilize reflective diary and built the knowledge sharing platform specified for nursing via internet (He, 2013). Commonly, all hospitals sharing nursing knowledge via hospital's conferences, small teaching lecture of staff nurses, nursing round and consultations, clinical nursing teaching, organizing voluntary group around interested topics and nursing documents which keep in departments as well as interpersonally communications.

However, in Autonomous Hospitals, there is no hospital's database and internet knowledge sharing platforms. although the social software "QQ" and "WeChat" are quite popular among young nurses, but few young nurses used them to sharing work-related knowledge. Lacked of the communities of sharing may be a limitation in Autonomous Hospital, for example, in Dali Bai Autonomous Hospital, the Quality Control Circle was introduced for few year, and community of sharing only regard to nursing research. In addition, some researchers stated one of the limitation of knowledge sharing might be that members view knowledge as the private property and were unwilling to share, while there may be a lack of awareness and nurses are too busy to care for their patients during duty (Ge et al., 2016). Thus, the barriers of the organizational, personal and technical may influence nurses' knowledge sharing.

In the term of job autonomy among nurses, since 2010, Chinese nursing care has transformed from function nursing care to holistic nursing care of responsibility system. Meanwhile, the new role of nurse "primary nurse" required nurse takes the responsibility of providing all nursing care for one patient till discharge (Wang & Yang, 2010). Compared to function nursing care, nurses must 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 accomplish (Xu, Yu, Ruan, & Wan, 2011; Yin, Liu, & Yang, 2013). In addition, a report (Modern Nursing Newspaper, 2015) indicated nurses should be encouraged to participate in the policy and standard making (Zheng & Liu, 2010). Fan and Chen (2013) suggested self-scheduling method is a popular way and accepted by nurses. These situations may increase nurse's job autonomy.

In summary, the nurses of Autonomous Hospitals in Yunnan province are facing more difficult situations and changes as mentioned above. These situations and changes may imply some problems about innovative behavior, job title, educational attainment, knowledge sharing and job autonomy. Therefore, it is meaningful to explore these five variables among nurses in Autonomous Hospitals, Yunnan province, the P. R. China.

Conceptual Framework

Conceptual framework of this study is based on literature review. Nurses' innovative behavior is defined as an act of seeking and developing new methods, techniques and work patterns, and introducing and applying the new idea into work (Bao et al., 2012). According to literature review, these four factors related to innovative behavior have been found that include job title, educational attainment, knowledge sharing and job autonomy. Job title and educational attainment are non-modified factors that associate to innovative behavior. Knowledge sharing and job autonomy are modified factors that relate to innovative behavior. In this study, knowledge sharing was measured based on knowledge sharing behavior model (Yi, 2009) and job autonomy was measured based on Work Autonomy model (Breaugh, 1985). Nurses who are senior nurse have more experience, under the stimulation of organization, they may perform more innovative behavior than junior nurses. In terms of educational attainment, nurses who obtained bachelor's degree may have more platforms and opportunities for sharing knowledge. Knowledge sharing provides platforms and opportunities to nurses for obtaining knowledge, communicating and developing new ideas. Job autonomy increases nurses' sense of responsibility. They may be willing to find or generate new ideas or solutions to improve quality of nursing care. In the present study, the relationships between innovative behavior and the four factors of job title, educational attainment, knowledge sharing and job autonomy were examined.