

ARTICLE

A Survey on Junior Nurses' Risk Perception Level and Its Influencing Factors

Lei PENG,¹ Ling JIN,² and Xincheng MA^{*,1}

¹The Seventh Affiliated Hospital, Sun Yat-sen University, Shenzhen, China, 518107.

²First Affiliated Hospital of Sun Yat-sen University Guangzhou China. Email: 1115975363@qq.com, <https://orcid.org/0000-0002-0652-6578>

*Corresponding author. Email: maxincheng@sysush.com, <https://orcid.org/0000-0001-6082-9898>

(Received 20 May 2022; revised 25 May 2022; accepted 10 June 2022; first published online 30 June 2022)

Abstract

objective Junior nurses' perceived risk level may affect their career satisfaction and performances. This study sought to investigate the current situation of risk perception level of junior nurses with undergraduate degrees and to determine its influencing factors, with the aim to provide a reference for nursing managers to carry out targeted training and education for junior nurses.

Methods A total of 484 junior nurses with undergraduate degrees from five tertiary hospitals in Guangdong Province were selected by the convenience sampling method as the research participants. The general information questionnaire, risk perception questionnaire and the Chinese version of the Positive and Negative Affect Schedule (PANAS) scale were used for the survey. **Results** The enrolled junior nurses scored 85.84 ± 13.56 (Full score was 100) on the risk perception survey. Working years, positive and negative affect, gender, and personality characteristics were the main influencing factors for junior nurses' risk perception levels ($P < 0.05$).

Conclusions Junior nurses' risk perception was at a moderate and acceptable level. However, their risk perception was higher in dimensions such as physical function, occupational exposure, and time. Therefore, nursing managers should pay attention to high-risk perception items, and targeted measures should be taken according to different characteristics of nurses to improve their ability to correctly recognize risks and eliminate negative emotions in order to improve the quality of nursing services.

Keywords: Junior nurses; Risk perception; Survey; positive and negative affect; Personality characteristics

1. Introduction

Risk perception refers to an individual's attitude, emotion, and subjective judgment about the characteristics and severity of a specific risk [1]. It belongs to the field of psychology and is an important indicator to measure the psychological panic of the public. In recent years, it has emerged as a new topic of medical public management [2]. Several studies have reported

that the risk perception of nurses has been positively linked to their occupational exhaustion. Nurses with high-perceived risk are prone to resign, which is particularly common among junior nurses with work experience fewer than three years [1-5]. According to the statistics in 2016, nurses with an undergraduate degree accounted for about 48.27% of the total number of registered nurses [5], suggesting that they have become the main work force in the nursing industry and occupy an indispensable position in the medical security system [6]. The growth and training of young or junior nurses are the main focus of nursing management, since it is likely to affect the development of hospitals and nursing disciplines in the future. Therefore, it is necessary to understand the current status of risk perception levels of junior nurses.

Positive and negative affect can have a healthy or unhealthy impact on people's psychology, and determine people's will and behavior. Studies have shown that emotion plays an important role in risk perception [7]. At present, there is no study on the risk perception level of junior nurses with undergraduate degrees in China, and no formal report is available on the relationship between nurses' positive and negative affect and risk perception.

Therefore, in this study, we sought to understand the current situation of junior nurses' risk perception, analyze its influencing factors, and explore its correlation with positive and negative affect, with the aim to provide a reference for nursing managers to carry out effective risk perception prevention strategies.

2. MATERIALS AND METHODS

2.1 Research participants

The convenience sampling method was used to select the junior nurses with undergraduate degrees in five tertiary A-level hospitals in Guangdong Province as the research objects from April to July 2021. The inclusion criteria include (1) obtaining a nurse professional qualification certificate and engaging in clinical work for less than 3 years, (2) having a bachelor's degree, and (3) volunteering to participate in this research. The exclusion criteria include (1) those who are not in the hospital due to vacation, studying abroad, etc., and (2) nurses who are doing an internship in the hospital.

2.2 The general information questionnaire

The general information questionnaire was made according to the research content by retrieving relevant literature and consulting relevant experts, including basic information such as gender, age, working years, marital status, department, professional title, and personality characteristics.

2.3 Nurses' risk perception questionnaire

The questionnaire was made based on the one published by Xinwei Zhang *et al.* (in 2016) [8]. It includes 28 items in six different dimensions, namely personal safety risk (5 items), physical function risk (4 items), occupational exposure risk (4 items), psychosocial risk (5 items), organizational factor risk (4 items), and time risk (6 items). Each item of the scale adopts the Likert 5-level scoring method, ranging from "strongly disagree" to "strongly agree" with 1 to 5 points, with a total of 28 to 140 points. The higher the score, the better

the risk perception of nurses. The internal consistency Cronbach's alpha coefficient of the questionnaire was 0.947 [9], suggesting that it has good reliability and validity.

2.4 The Chinese version of the Positive and Negative Affect Schedule (PANAS) scale

The PANAS table (the Chinese version) was compiled by Li Huang et al. [10], with a total of 20 items using the Likert 5-level scoring method (None=1, Low=2, Moderate=3, High=4, Very high=5). The odd-numbered questions are positive sentiment scores and even-numbered questions are negative sentiment scores. The Cronbach's alpha for internal consistency of the table was 0.82.

2.5 Survey data collection

Questionnaires were collected in two forms, including field filling and online filling using Questionnaire Star App. After obtaining the support and consent of the heads of each hospital, four researchers who have been uniformly trained by the researchers distributed questionnaires to each department of the hospital. When filling out the questionnaire on-site, the researcher explained to the subjects the purpose of the study and matters needing attention before the investigation using a unified instruction language, as well as the principle of voluntary participation. The participants then filled it out independently and anonymously. In order to ensure the quality of the questionnaire, after the subjects completed the filling, the researcher took it back and checked the integrity and validity of the questionnaire on the spot, and corrected the problems in time. For departments in-person visiting was not allowed due to the COVID-19 epidemic, researchers would distribute electronic questionnaires in the form of Questionnaire Star App. In the end, a total of 496 questionnaires were distributed, and 496 were recovered. After excluding 12 invalid questionnaires such as omissions (n=4) and obvious regularity of answers (n=8), 484 valid questionnaires were recovered, with an effective rate of 97.6%.

2.6 Statistical analysis

A database was established using the Excel software by two researchers using the collected data. The SPSS 20.0 statistical software was used for statistical analysis. Enumeration data were expressed as frequency and percentage. Measurement data were expressed as mean \pm standard deviation (SD). For the comparison of risk perception of junior nurses with different characteristics, two independent student's t-test and the one-way analysis of variance (ANOVA) were used. Multivariate linear stepwise regression analysis was used for identifying the affecting factors. The P-value less than 0.05 was considered statistically significant.

3. RESULT

3.1 General information of respondents

A total of 484 nurses (16 males and 468 females) were included in this study, with an average age of 24.33 ± 1.49 years old. Their general information is summarized in Table 1.

Table 1. General information and univariate analysis of risk perception scores of junior nurses

Parameters	Number of nurses	Percentage	Score	F/t	P value
Gender				11.375	0.001
Male	16	3.30%	77.13±7.07		
Female	468	96.70%	86.13±13.63		
Age (years)				4.413	0.013
21-23	122	25.20%	83.88±11.18		
24-26	322	66.50%	85.92±13.75		
27-29	40	8.30%	91.15±17.10		
Working years				37.541	<0.001
<1	188	38.90%	81.12±11.31		
12	158	32.60%	84.93±11.62		
>2	138	28.50%	93.30±14.77		
Marital status				0.369	0.369
Single	304	62.80%	85.63±13.23		
Married	180	37.20%	86.19±14.13		
Department				2.737	0.028
Internal Medicine	174	36.00%	84.80±12.76		
Surgery	158	32.60%	86.35±13.17		
Gynecology and Pediatrics	60	12.40%	83.27±13.00		
Emergency or ICU	60	12.40%	90.55±16.34		
Others	32	6.60%	84.94±13.56		
Professional title				18.683	<0.001
Nurse	282	58.30%	82.42±11.91		
Nurse Practitioner	202	41.70%	90.60±14.30		
Personality type				4.695	0.001
Introvert	47	9.70%	89.77±14.75		
Extrovert	104	21.50%	81.25±12.15		
Ambivert	234	48.30%	86.60±13.29		
Tend to be extrovert	71	14.70%	86.17±13.25		
Tend to be introvert	28	5.80%	89.07±15.91		

ICU: intensive care unit.

3.2 Comparison of risk perception levels of low-year capital nurses with different demographic characteristics

Taking the general information of junior nurses as the independent variable and the risk perception score as the dependent variable, the univariate analysis was carried out. As shown in Table 1, the results showed that there were statistically significant differences in the risk perception level of junior nurses in terms of gender, age, working years, department, professional title, and personality type ($P<0.05$).

3.3 Junior nurses' risk perception and scores in different dimensions

The total score of risk perception of junior nurses with an undergraduate degree was 85.84 ± 13.56 . The items of each dimension were divided into physical function risk, occupational exposure risk, time risk, organizational factor risk, personal safety risk, and social psychological risk from high to low. The detailed scores were listed in Table 2.

Table 2. Survey on junior nurses' risk perception and scores in different dimensions (n=484, mean \pm SD)

Scales and dimensions	Item numbers	Total score	Item score
Risk perception	28	85.84 ± 13.56	3.06 ± 0.48
Personal safety risk	5	12.61 ± 3.72	2.91 ± 0.53
Physical function risk	4	13.26 ± 3.40	3.48 ± 0.69
Occupational exposure risk	4	12.74 ± 3.11	3.33 ± 0.65
Psychosocial risk	5	13.93 ± 3.19	2.68 ± 0.64
Organizational factor risk	4	11.59 ± 2.77	2.97 ± 0.61
Time risk	6	18.63 ± 4.92	3.13 ± 0.78

3.4 Correlation analysis of risk perception and positive and negative affect among junior nurses

In this study, the scores of positive affect and negative affect of junior nurses were 30.57 ± 7.60 and 26.40 ± 7.67 , respectively. As shown in Table 3, the results of Pearson correlation analysis showed that the risk perception level of junior nurses was negatively correlated with positive affect and positively correlated with negative affect.

Table 3. Correlation analysis of risk perception and positive and negative affect among junior nurses (n=484r)

Parameters	Positive affect	Negative affect
Risk perception	-0.076	0.187*
Personal safety risk	-0.208*	0.172*
Physical function risk	-0.086	0.249*
Occupational exposure risk	-0.193*	0.185*
Psychosocial risk	-0.045	0.216*
Organizational factor risk	0.172*	0.380*
Time risk	-0.180*	0.331*

*P<0.05.

3.5 Multiple linear stepwise regression analysis of factors influencing risk perception of junior nurses

The eight variables with statistical significance in univariate analysis and correlation analysis were used as independent variables, and the total score of risk perception of junior nurses was used as the dependent variable to conduct multiple linear regression analysis. The

assignment of each variable is listed below: gender (Male = 1, Female = 2), age (21-23 years = 1, 24-26 years = 2, 27-29 years = 3), working years (<1 year = 1, 1-2 years = 2, >2 years = 3), department (internal medicine=1, surgery=2, gynecology and pediatrics=3, emergency or ICU=4, other=5), professional title (nurse=1, nurse practitioner=2), personality type (Introvert = 1, Extrovert = 2, Ambivert = 3, More extrovert = 4, More introvert = 5). The positive and negative affect scores were entered as raw values. The results showed that working years, positive affect, negative affect, gender, and personality types were the main factors affecting the risk perception of junior nurses ($P<0.05$).

Table 4. Multivariate stepwise regression analysis affecting the risk perception level of junior nurses

Parameters	β	SE	β'	t	P
Constant variable	56.6	6.652	-	8.509	0.000
Working years	4.916	0.656	0.296	7.497	0.000
Negative affect	0.615	0.072	0.348	8.545	0.000
Positive affect	-0.47	0.072	-0.263	-6.565	0.000
Gender	7.58	2.94	-0.1	2.579	0.010
Personality type	1.09	0.54	0.079	2.018	0.044

Note: $R=0.533$, $R^2=0.284$, $F=38.008$, $P=0.000$.

4. DISCUSSION

4.1 Overview of the current situation of junior nurses' risk perception level

The total score of junior nurses' risk perception in this study was 85.84 ± 13.56 , and the total average score of the items was 3.06 ± 0.48 . Taking 5 points as a benchmark, these data suggest that the risk perception of junior nurses is overall at a moderately acceptable level, but lower than the results of the study by Zhaoyun Chen et al. [11], which might be due to the different enrolled study populations. In terms of dimensions, junior nurses scored above 3 in the items of "physical function risk", "occupational exposure risk" and "time risk", indicating that their risk perception level was relatively high. Some researchers believe that risk perception could affect the physical and mental health and work status of nursing staff, thereby affecting the quality of clinical care [12]. Therefore, it urgently requires the attention of nursing managers. The reasons for the high risk perception level in physical function may be as follows. First, due to the shortage of nursing staff in our country, the 24-hour shift mode can have an important impact on the health of nurses, and most junior nurses are the main workforce in clinical night shifts [13]. Frequent night shifts can disrupt the body's biological clock. Night shift and working overtime further aggravate the threat to the health of nursing staff, resulting in poor sleep quality. Moreover, according to the reports, the prevalence of low back pain among nurses is higher than in healthy individuals [14]. Due to the particularity of nursing work, junior nurses often need to perform repetitive labor [15], such as changing dressings, infusions, etc., and standing for a long time. Such a single posture for a long time increases the risk of physical damage, and is more sensitive to the risk of physical function. The possible reasons for the high perceived risk level of occupational exposure are as follows. First, in the process of providing nursing services for

patients, nursing staff are often exposed to blood, body fluids, and pollutants, such as contact with contaminated needles, catheters, etc. Senior nurses are more likely to have occupational exposure [16]; Second, with the development of the information society, the news media vigorously publicize and report occupational exposure-related events, and it is better to understand the development, prognosis and potential complications of post-exposure diseases. With more thought, when nurses become more aware of their events, they will also be more worried about the occurrence of various infection risks in the nursing process. For the possible reasons for the high time risk perception level, first, due to the fact that junior nurses have a lot of assessment training, they basically have very limited time to enjoy life [17]. Second, the subjects selected for this study have undergraduate degrees. Since they entered the society at a later age, most of whom are 22–23 years old, they would usually face the pressure of relationship, marriage, or having children. Moreover, given that junior nurses usually have long working hours and have relatively little social interaction, it further deepens the nurses' risk perception level of time management.

4.2 Influencing factors of risk perception among junior nurses

Working years

The results of this study show that working years are the main factors affecting the risk perception of junior nurses. The longer the working years, the higher the risk perception level, which is consistent with the report by Xinwei Zhang et al [8]. First, new nurses who have just entered the workplace often lack awareness of environmental risk factors, and their ability to judge clinical risks is low [18]. With the increase of working years, the frequency of experiencing various emergencies and crises increases, and the awareness of the risks of nursing work increases accordingly. However, there are two sides to things. The increase in awareness also increases the level of panic during emergency, which leads to an increase in the level of risk perception. Second, most of the nursing staff who worked in this study for more than one year were in a stable state. In order to stabilize the long-term development of their careers, they expect themselves to perform better in the department and get the attention and recognition of their leaders. To a certain extent, this also adds a certain amount of psychological pressure to themselves. Studies have shown that relieving psychological stress can effectively reduce the level of risk perception [19]. Third, with the increase of working years, roles are constantly changing and responsibilities increase. Nurses are afraid of making mistakes in nursing work, and they are prone to negative emotions in this long-term stressful state [20]. This study found that negative affect had a positive predictive effect on the level of risk perception. Therefore, an increase in negative affect can easily lead to an increase in risk perception.

Positive and negative affect

The data of this study showed that both positive and negative affect were influencing factors of risk perception among junior nurses, and were negatively correlated with positive affect and positively correlated with negative affect. That is, the lower the positive affect or the higher the negative affect, the higher the risk perception level. The reasons for this phenomenon may be as follows. First, positive affect is manifested in emotions such

as being inspired and energetic. When facing a crisis event, positive affect can mobilize one's rationality and wisdom, correctly understand risks, balance one's negative emotions, and increase confidence in solving problems [21]. This could help reduce the level of psychological panic, thereby reducing the level of perceived risks. Second, negative affect represents the restless, fearful, and afraid emotions of people. When facing setbacks, people with negative affect are overwhelmed and anxious. Their emotions cannot be relieved and the problems remain, which makes their level of risk perception continue to rise. At the same time, there may be adverse effects such as personal job boredom. Studies have shown that improving positive affect could reduce medical staff burnout. Therefore, it is suggested that hospital managers should carry out mental health screening in stages, pay more attention to the psychological state of nurses in different stages and periods, and communicate with them in time if any problems appear.

Gender

Similar to the data of the study by Gao Hui et al. [22] on risk perception of hemodialysis patients, our results also suggest that gender is the main influencing factor of risk perception among junior nurses, and the risk perception level of women is higher than that of men. In general, men tend to think introverted and are good at analytical and logical judgment, while women tend to be more introverted or extroverted in the psychological functions of perception, intuition, and feelings, and they are delicate and sensitive [22]. When female nurses face the pain and even death of patients when they first enter the job, they are more likely to feel a sense of disappointment and physical exhaustion. Coupled with the instability of estrogen in the body may further aggravate negative emotions, eventually leading to high levels of risk perception [23]. In addition, studies have shown that women's perception of physical function is higher than men's [24]. Clinically, nursing staff often need to carry patients and other weight-bearing work, which can easily lead to low back pain caused by skeletal muscle damage. However, anatomically, males have larger bones and greater strength than females, so they do not appear to be very strenuous to perform heavy physical activities, and the risk of physical damage is relatively low. As a result, they also have relatively low levels of perceived risk of physical function.

Personality characteristics

In this study, nurses with introverted personalities had higher risk perception level scores, while nurses with extroverted personalities scored lower, suggesting that personality characteristics were the main influencing factors of junior nurses' risk perception. The underlying reasons are obvious. First, studies have shown that people who pursue high-risk activities usually have low risk perception ability [25], while people with extroverted personality traits like to pursue exciting things and participate in risky behaviors, their risk perception levels tend to be lower than introverts [26]. Moreover, the extrovert personality represents positive enthusiasm, talkativeness, and good social skills [27], while the introvert personality represents closed introversion, timidity, and quietness. When faced with the same risk situation, extroverts are better at communicating with others, actively seeking social support, and solving current difficulties. On the contrary, introverts often hide their distress and

could not get rid of the negative thoughts, which increases the burden of psychological pressure, and therefore have a higher level of risk perception.

To sum up, the data in this study suggest that junior nurses' risk perception is at a moderate level, but their risk perception items such as physical function, occupational exposure, and time are high. Working years, gender, personality characteristics, positive and negative affect are the influencing factors of the risk perception level of low-year capital nurses. Nursing managers should pay attention to high risk perception projects, and take targeted measures according to nurses with different characteristics, so that nurses can correctly view and understand risks, eliminate the negative effects caused by risks, and stabilize the construction of nursing teams.

References

- [1] Jacob Jacoby and Leon B. Kaplan (1972) , "The Components of Perceived Risk", in SV - Proceedings of the Third Annual Conference of the Association for Consumer Research, eds. M. Venkatesan, Chicago, IL : Association for Consumer Research, Pages: 382-393.
- [2] Zeng Zhi, Xiang Gaoyue, Chen Xingzi. A review of research on medical risk perception [J]. China Health Career Management Journal Publisher, 2018,35(6):478-480.
- [3] Zhang Guifang, Liu Zhenya, Gao Shijuan, et al. Application of situational simulation exercises in emergency ability training of junior nurses[J].Chinese Journal of Nursing Education,2019,16(07):532-535.
- [4] Ma Lifang, Zhang Yaqi, Niu Yanbin, et al. Research on the influence of organizational support and risk perception of operating room nurses on their occupational exhaustion [J]. Chinese Nursing Research,2018,07:1159-1162.
- [5] Xu Yimin, Wu Ying, Zhang Yan, et al. A survey on the current situation of hospital nurses' human resources in China[J].Chinese Journal of Nursing,2016,51(07):819-822.
- [6] Wang Xiuxia, Chao Lihong. Investigation on career planning and management of first degree undergraduate nurses[J].Hospital Administration Journal of Chinese People's Liberation Army,2018,25(07):635-638.
- [7] Sobkow A,Traczyk J,Zaleskiewicz T.The Affective Bases of Risk Perception: Negative Feelings and Stress Mediate the Relationship between Mental Imagery and Risk Perception[J].Front Psychol,2016,247:932.
- [8] Zhang Xinwei. Research on the preparation and influencing factors of risk perception questionnaire for nursing staff [D]. Fourth Military Medical University, 2016.
- [9] Zhang Xinwei, Cao Guolei, Xu Zhimin, et al. Development of the Risk Perception Questionnaire for Nursing Staff [J]. Chinese Nursing Research, 2016,30(19):2353-2355.

- [10] Huang Li, Yang Tingzhong, Ji Zhongmin. A study on the applicability of the positive and negative emotion scale in Chinese population[J]. Chinese Mental Health Journal, 2003, 17(1):54-56.
- [11] Chen Zhaoyun, Gao Hui, Zhang Yinling. Analysis of the status quo and influencing factors of risk perception among nurses in a tertiary hospital [J]. Chinese Nursing Research, 2017,31(08):929-931.
- [12] Zhang Xinwei, Fang Lei, Zhang Yinling. Qualitative research on risk perception of nursing staff[J]. Journal of Nursing Science, 2015,30(16):74-76.
- [13] Qin Ailing, Qu Hong, Wang Qingli. Investigation and analysis on safety cognition and training needs of junior nurses [J]. Journal of Nursing, 2014, 18: 7-10.
- [14] Zeng Jiaqi, Yuan Gan, Tian Lingyun, et al. Investigation and analysis of the current situation and influencing factors of occupational low back pain in nurses [J]. Journal of Nursing Science, 2020, 03: 60-63.
- [15] Xia Zhijun, Tang Shunqing. Research progress of nurses' health self-management [J]. China Continuing Medical Education, 2020, 12(13): 194-196.
- [16] Zhang Xin, Zhuang Zhenhong, Xie Peiling. Investigation and Analysis of Influencing Factors of Clinical Sharps Injury [J]. Medical Innovation of China, 2016, 16 (6): 87-90.
- [17] Chen Yunmei, Zhu Shulian, Liao Peijiao, et al. Application of diversified training mode in the training of new surgical nurses [J]. Journal of Practical Clinical Nursing Science, 2017, 2(20): 138-141.
- [18] Li Yuying, Fei Yingjun, Yang Li, et al. Investigation on occupational safety protection cognition and behavior of junior nurses [J]. Chinese Journal of Industrial Medicine, 2019, 32(02): 158-159.
- [19] Pei Xiao, Li Danlin. Study on risk perception of diabetic patients and trust in nurse-patient relationship [J]. Chinese Nursing Research, 2018, 32(06): 947-950.
- [20] Li Xiaofang, Tang Jing, Shi Minxiu, et al. Analysis on the status quo and influencing factors of occupational risk perception among nurses in the military top three general hospitals [J]. Journal of Nursing Science, 2014, 29(13): 7-9.
- [21] Barr P. Personality Traits, State Positive and Negative Affect, and Professional Quality of Life in Neonatal Nurses. J Obstet Gynecol Neonatal Nurs[J]. 2018,47(6):771-782.
- [22] Gao Hui, Liu Na, Jiang Shanjiao, et al. Research on the status quo and influencing factors of risk perception in maintenance hemodialysis patients [J]. Journal of Ningxia Medical University, 2019, 41(09): 909-913 .
- [23] Yang Yong, Li Junjiao, Chen Wei, et al. Gender differences in the acquisition and extinction of fear memory and its neural mechanism [J]. Psychological Science, 2020, 43(01): 224-231.

- [24] Zhu Shihui. Differences in risk perception among Chinese outbound tourists and their preference for information sources [J]. *Commercial Research*, 2015, 457: 163-168.
- [25] Zhang Sujuan. The relationship between engineering project manager personality and risk perception: the mediating effect of risk propensity [D]. Tianjin: Tianjin University, 2014.
- [26] Vollrath M, Torgersen S. Who takes health risks? A probe into eight personality types. *Personality and Individual Differences* [J], 2002, 32(7), 1185-1197.
- [27] Luo Jie, Dai Xiaoyang. Preliminary development of the Chinese Adjective Big Five Personality Scale I: Theoretical Framework and Test Reliability [J]. *Chinese Journal of Clinical Psychology*, 2015, 23(03): 381-385.