Current Situation and Influencing Factors of Nursing Information Ability of Nurses in Traditional Chinese Medicine Hospital

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Abstract: In order to understand the nursing information ability of nurses in traditional Chinese medicine hospitals and explore its influencing factors. From April to June 2023, a survey was conducted on 420 in-service nurses in Xi'an Traditional Chinese Medicine Hospital using a general information questionnaire, a nurse information ability evaluation scale, and an organizational innovation atmosphere scale. The results showed that the total score of nursing information ability of nurses in traditional Chinese medicine hospitals was (82.25±13.91)points, and the total score of organizational innovation atmosphere was (79.72±10.61) points. The total score of nursing information ability was significantly positively correlated with organizational innovation atmosphere (r=0.280, P<0.01).Therefore, the nursing information ability of nurses in traditional Chinese medicine hospitals is at a moderate level and needs further improvement.

Keywords: Nurses, Nursing information competence, Organizational innovation climate

1．Introduction

The quality of medical industry informatization construction is related to the future development of hospitals and even the entire medical and health system, and is also the key task of domestic hospital informatization construction during the 14th Five-Year Plan period[1]. As the main implementer of medical activities, nurses need to systematically learn and apply the knowledge of computer, information, cognitive science and other aspects to their work[2], which puts higher requirements on the informatization ability of nurses. however, the domestic nursing information research starts late, There are few researches on nursing information ability of nurses in TCM hospitals. Therefore, the aim of this study is to investigate the current situation of clinical nurses' information ability in a traditional Chinese medicine hospital in a certain city, explore its influencing factors, and provide theoretical basis for the hospital management department to formulate relevant policies.

2. Materials and methods

2.1. General information

From April 2023 to June 2023, 420 nurses from Xi 'an Hospital of Traditional Chinese Medicine were selected by convenience sampling method. Inclusion criteria: (1) nurses who are officially registered and use the nursing information system; (2) Informed consent and voluntary participation in this investigation. Exclusion criteria: nurses who practice or study. The formula method was used to calculate the sample size. The scale with the most items in the scale used in the research was selected. The scale with 10 times the items and 20% loss rate were added to obtain the final sample size. The Chinese version of Nursing Information Ability Assessment Scale was selected, which contained 32 items with a sample size of 32×10× (1+20%) =384, and 420 samples were finally included in this survey.

2.2. Research Tools

①General data questionnaire: designed by myself after consulting literature, including 8 contents, such as gender, age, education level, job title,etc. ②Nursing information ability evaluation scale: Compiled by Luo Hong[3]of Jilin University in 2016, the scale has a total of 32 items, including 5 dimensions of nursing information awareness, computer operation ability, computer software management ability, nursing information operation ability, and nursing information management ability. Using 5-level Likert scoring method, the scale is rated from 1 to 5 points from "completely inconsistent to completely consistent". The total score ranges from 32 to 160 points. Cronbach'sα coefficient is 0.947[4]. ③Nurse organization innovation climate scale: Compiled by scholar Qian Yan[5],the scale has a total of 21 items. Using 5-level Likert scoring method, the scale is calculated from 1 to 5 points from "strongly disagree to strongly agree", and the score ranges from 21 to 105 points. The higher the score, the better the cognition and experience of innovation atmosphere in nurses' organizations. Cronbach'sα coefficient was 0.938.

2.3. Questionnaire survey method was adopted

With the help of the "Juanxing" platform, an electronic questionnaire was produced and a QR code poster was generated. After obtaining the consent of the nursing department of the hospital, the QR code poster, research purpose, filling instructions and informed consent were distributed to each department's work group and filled in anonymously. After the questionnaire was collected, the quality of questionnaire filling was checked. 16 questionnaires with repeated filling and obvious logic contradictions were eliminated. Finally, 404valid questionnaires were recovered, with a recovery rate of 96%.

2.4. Statistical Methods

SPSS26.0 software was used to analyze the data. The measurement data conforming to normal distribution were described by means plus ± standard deviation ($\overline{x} \pm s$), and independent sample T-test or one-way analysis of variance were used. Pearson correlation analysis was used. Test level α=0.05.

3. Results

3.1. Scores of nurses' nursing information ability and organizational innovation atmosphere in TCM hospitals (see Table1)

Table 1: Scores of nurses' nursing information ability and organizational innovation atmosphere in TCM hospitals ($\overline{x} \pm s$, n=404).

items	Number of entries	Total points	Entry equalization
Nurse information ability	32	82.25±13.91	2.57±0.43
Nursing information consciousness	4	9.74±2.16	2.44±0.54
Computer ability	8	21.49±5.63	2.69±0.71
Computer software management ability	5	13.63±3.57	2.73±0.71
Nursing information operation ability	3	8.54±2.14	2.85±0.71
Nursing information management ability	12	28.85±7.29	2.40±0.61
Nurse organization innovation climate	21	79.72±10.61	3.81±0.60
Innovation incentive	7	30.48±4.06	4.35±0.58
Resource supply	6	21.77±4.03	3.63±0.67
Management practice	8	26.47±4.78	3.81±0.60

3.2. Single factor analysis of nursing information ability of nurses in Chinese hospital

The results showed that there were statistically significant differences in nursing information ability scores among nurses with different ages, professional titles, years of using information systems, years of working, whether they had received information system training, and whether they learned

professional knowledge through the Internet (P<0.05),as shown in Table 2.

Table 2: Univariate analysis of nursing information ability of nurses in TCM hospitals (n=404).

Items	Number of people	Score	*F*	*P*
Sex			1.54	0.215
Male	14	86.79±20.61		
Female	390	82.09±13.62		
Age (years)			2.484	0.043
18～25	57	84.5±14.72		
26～30	124	80.87±14.17		
31～40	157	84.18±12.82		
41～50	52	84.4±14.82		
51～60	14	78.93±13.71		
Educational level			0.307	0.736
High school/technical school/technical school	4	77±6.48		
Junior college	21	81.71±18.98		
undergraduate	379	82.34±13.66		
The title of a professional post			2.87	0.036
Nurse	66	81.23±15.68		
Nurse practitioner	157	80.25±13.51		
Supervisor nurse	156	84.01±13.21		
Associate chief nurse and above	25	86.56±14.20		
Years of use of information system (years)			12.03	0.001
1-2 years	386	81.74±13.90		
3-5 years	18	93.22±9.03		
Years of service (years)			9.608	0
1-5years	111	87.48±13.75		
6-10years	108	81.04±12.47		
11-15years	83	84.93±14.43		
＞15years	102	86.94±13.44		
Have received any information systems training			5.73	0.004
Yes	273	83.74±13.71		
No	101	78.32±13.35		
Have no idea	30	82.03±15.39		
Whether to use the Internet to learn professional knowledge			5.924	0.015
Yes	347	81.58±13.56		
No	57	86.39±15.38		

3.3. Correlation results between nurses' nursing information ability and organizational innovation atmosphere in TCM hospitals (see Table 3)

Table 3: Correlation between nurses' nursing information ability and organizational innovation atmosphere in TCM hospitals (r value).

Items	Total score of the information competence assessment scale for nurses	Nursing information consciousness	Computer ability	Computer software management ability	Nursing information operation ability	Nursing information management ability
Total score of the nurse Organization Innovation Climate Scale	.280**	.315**	.169**	.116*	.142**	.212**
Innovation incentive	.264**	.254**	.158**	.107*	.186**	.200**
Resource supply	.300**	.275**	.180**	.121*	.136**	.253**
Management practice	.145**	.251**	0.089	0.065	0.044	0.088

* At 0.05 level (two-tailed), the correlation was significant; ** At level 0.01 (two-tailed), the correlation was significant.

4. Discussion

4.1. Current situation of nursing information ability of nurses in TCM hospitals

The results of this study showed that the total score of nurses' nursing information ability was (82.25±13.91), which was lower than the results of Zhu Li et al[6].(120.75±27.42). In the average score of each dimension item, the nursing information operation ability score (2.85±0.71) was the highest, and the nursing information management ability score (2.40±0.61) was the lowest, which was similar to the research results of Zhu Li[6]and He Xiaolu[7].Nursing information ability refers to the comprehensive ability of clinical nurses in nursing information activities, including knowledge, attitude and skills. It mainly covers three ability modules: computer skills, information literacy and information management[8]. The application of nursing information system can improve nursing work efficiency and reduce nursing error rate[9].Compared with foreign countries, the development of nursing information education in domestic colleges and universities is backward, the curriculum system is incomplete, and the content is not comprehensive enough to meet the needs of clinical information office. A large number of nursing practices will bring continuous accumulation of experience, but the lack of theoretical knowledge will lead to the lack of nurses' nursing information management ability. Although the hospital of Traditional Chinese medicine in our city is a third class A, it is located in the northwest area, the economic development is unbalanced, and the construction of medical information in the hospital is slow, which restricts the development of nursing information. In addition, the nursing information system currently used in hospitals cannot meet the actual needs of clinical nursing work, and the software developers have no medical background, so the software development is not suitable[10].It is suggested that medical colleges should improve the curriculum system, increase the curriculum setting of nursing informatization, improve students' information literacy and ability, and give students the opportunity to participate in the construction of nursing informatization. In addition, nursing managers can organize nurses to study in hospitals with perfect medical information construction equipment and high level, so as to improve their theoretical knowledge and skill level of nursing information profession.

4.2. Analysis of influencing factors of nurses' nursing information ability

The results of this study showed that nurses with different ages, professional titles, years of using information systems, years of work, whether they have received information system training, and whether they use the internet to learn professional knowledge are the influencing factors of nursing information ability, and the differences are statistically significant (P<0.05).This study found that nurses aged 18-25 and 31-50 have stronger nursing information abilities.Kleib's[11]study showed a significant negative correlation between the age of nurses and their information abilities,with older nurses having lower information abilities. Newly graduated nurses have a high level of work enthusiasm, are good at active learning and thinking, have a stronger desire to explore new things than senior nurses, have stronger computer learning and operation abilities, are more familiar with information knowledge and skills, and have higher nursing information abilities, which is consistent with the research results of Chen Yuan et al[12].The study also found that nurses with higher professional titles and longer working years have stronger information management abilities. Nursing information systems are a key tool for nursing quality management, and are crucial for continuous improvement of clinical work effectiveness. Long term integration with information systems makes nurses more skilled in information retrieval, application, evaluation, and organization.The results of this study suggest that receiving information system training has an impact on the information ability of clinical nurses, which is consistent with the research results of Yu Zijuan et al[13].Nurses who receive long-term information professional training are more likely to master nursing information systems. When using information systems, they will actively apply the knowledge they have learned, leverage the advantages of information systems, and even participate in the design and development of nursing information systems. However, this study also found that one-third of nurses did not participate or were unclear about whether they had participated in information professional training, which may be due to the hospital's delayed implementation of information professional training, insufficient training time and content.Whether or not to use the internet for professional knowledge learning can also affect the information ability of nurses. In the era of information explosion, using online learning has become an important way for the public to improve their comprehensive abilities. The abundance of online information resources and the degree of information ability and knowledge mastery depend on individual subjective initiative. Nurses with stronger learning initiative will actively seek solutions when encountering problems, and the internet is undoubtedly the most convenient and effective way. Therefore, nursing managers should also regularly organize nursing information ability training or attend relevant meetings to broaden the sources of information for nurses. At the same time, it is necessary to optimize the training plan for new nurses, incorporate standardized nursing information

system training content, and conduct knowledge and skill training simultaneously to improve the information literacy and ability of nurses[14].

4.3. Current Situation of Innovative Climate for Nurses in Traditional Chinese Medicine Hospitals

The innovative atmosphere of nursing organization refers to the cognitive and experiential level of innovation among clinical nurses in the department, nursing department, and internal environment of the hospital[5]. The results of this study showed that the total score of nurse organizational innovation atmosphere was (79.72±10.61) points, with an average score of (3.81±0.60)points, slightly lower than the survey results of Zheng Yaping[15]on nurses in Western medicine hospitals (4.00±0.47)points, indicating that the organizational innovation atmosphere of nurses in traditional Chinese medicine hospitals is relatively low. Among them, the innovation incentive dimension scored the highest, while the resource supply dimension scored the lowest, which is basically consistent with the research results of Zhao Xinna et al[16]. This indicates that although nursing managers in traditional Chinese medicine hospitals attach importance to organizational innovation atmosphere, their attention is relatively low, and related policies are not perfect enough, resulting in less participation of nurses in nursing management and insufficient understanding and experience of organizational innovation atmosphere. Therefore, nursing managers in traditional Chinese medicine hospitals should refer to medical institutions with good organizational innovation atmosphere based on the actual situation of the hospital, provide policy support to nurses, actively create a positive organizational innovation atmosphere for clinical nurses, encourage nurses to participate in various forms of innovation training activities online or offline, stimulate nurses' innovation awareness, and improve their innovation ability.

4.4. Correlation analysis between nurse nursing information ability and organizational innovation Climate

The results of this study showed a significant positive correlation (r=0.280,P<0.01) between the total score of nursing information ability and organizational innovation atmosphere, indicating that the better the organizational innovation atmosphere, the higher the nursing information ability of nurses. Research has shown[17] that the organizational innovation atmosphere has a significant impact on the information ability and innovative use of nursing information systems by clinical nurses, and the information ability of nurses also affects their innovative use of information systems. The nursing information awareness of nurses is a prerequisite for the innovative use of information systems, and computer operation ability and nursing information operation ability are the basis for behavior generation. The ability to manage computer software and nursing information involves the design and implementation of nursing information systems. Nurses can use nursing information system resources to conduct nursing research and nursing management. These are important manifestations of the combination of information theory and practice, which puts higher requirements on the information ability of nurses. If nursing leaders can change their leadership style, listen to the thoughts and suggestions of nurses in a timely manner, encourage them to express different opinions and opinions without any concerns, and take corresponding incentive measures, it will greatly promote the development of nursing information ability of nurses and improve nursing quality. At the same time, hospitals should increase investment in information technology construction, ensure resource supply, such as strengthening training, updating equipment, and promoting the comprehensive development of nurse information capabilities.

5. Summary

The nursing information ability of nurses in traditional Chinese medicine hospitals is at a moderate level, and factors affecting nursing information ability include age, professional title, years of using information systems, years of work, whether they have received information system training, whether they use the internet for professional knowledge learning, and organizational innovation atmosphere. Next, we should focus on how to improve the nursing information ability of nurses. China is currently in a stage of rapid development in information technology. The application of artificial intelligence and 5G technology has accelerated the process of medical informatization. Our hospital's information construction should keep up with the trend of the Internet era, update equipment, strengthen the cultivation of information technology talents, and nursing managers should pay more attention to the importance of nursing information ability in improving patient safety and clinical nursing quality. We should do a good job in continuing education and training for nursing information technology to achieve the goal of improving the level of nursing information technology among nurses.

References

[1] Zhao Xia, LI Xiaohua. Some thoughts on the development of hospital informatization construction during the 14th Five-Year Plan period [J]. Chinese Hospital, 2021, 25(01):64-66.

[2] Harrington L. American Nurses Association releases new scope and standards of nursing informatics practice [J]. AACN Adv Crit Care, 2015, 26(2):93-96.

[3] Luo Hong. Preparation and empirical Study of Nursing Information Competence Scale [D]. Jilin University, 2016.

[4] Luo Hong, Li Xiaohan, Li Yuling, et al. Development of nursing information competence Scale and its reliability and validity test [J]. Chinese Journal of Nursing Management, 2019,20(03):423-427.

[5] Qian Yan, Zhang Yaqing, Wu Juemin, et al. Preliminary construction and reliability and validity test of nurse organizational innovation Climate scale [J]. Chinese Journal of Nursing, 2016, 51(02): 243-247.

[6] Ju Lili, Zhao Xiaomin. Research on the current situation and influencing factors of clinical nurses' information ability in hospitals of different grades in a city [J]. Health Vocational Education, 2022, 40(22):91-94.

[7] He Xiaolu, Tan Xiaoyan, Huang Tieniu, et al. Current situation and influencing factors of nursing information ability of nurses in Grade A hospitals in Hunan Province [J]. Nursing Practice and Research, 2022,19(02):194-199.

[8] Sun Qiuyu, ZHANG Jingxuan, LIU Yuqi et al. Research progress of nursing information ability training for clinical nurses [J]. Chinese Journal of Modern Nursing,2022,28(19):2521-2526.

[9] Zheng E, Yang Mei, FENG Xianqiong. Current situation and enlightenment of nurses' use behavior of nursing information system in tertiary and Grade A general hospitals [J]. Nursing Research, 2018, 32(06):961-965.

[10] Huang Chen, Pan Hongying. Establishment and practice of information nurse post [J]. Chinese Journal of Nursing,2017,52(05):546-548.

[11] Kleib M, Nagle L. Factors Associated With Canadian Nurses' Informatics Competency[J]. Comput Inform Nurs, 2018,36(8):406-415.

[12] Chen Yuan, Lin Bixia, Zhang Bolun, et al. A survey and analysis of the current status of nursing information ability among clinical nurses in tertiary hospitals [J]. Modern Clinical Nursing, 2020,19 (09): 13-18.

[13] Yu Zijuan, Zhang Yan, Li Hongjie, etc. Analysis of the Current Situation and Influencing Factors of Nursing Information Ability of Nurses in Third Class A Comprehensive Hospitals in Zhengzhou City, Henan Province [J]. Journal of Nurse Continuing Education, 2020,35 (05): 399-403.

[14] Li Jing. Survey on the demand for standardized pre job training for newly hired nurses [J]. Tianjin Nursing, 2021, 29 (01): 109-111.

[15] Zheng Yaping, Wang Hui, Luo Yao, etc. The mediating role of organizational innovation atmosphere in the relationship between nurse information literacy and innovative behavior [J]. Journal of Nursing Management, 2023:1-5.

[16] Zhao Xinna, Zhao Liting, Hao Shuya. Research on the Current Situation of Nurses' Research Ability and Organizational Innovation Atmosphere [J]. Journal of Nursing Management, 2022,22 (01): 67-71.

[17] Wu Hongtao. Research on the influencing factors and improvement needs of innovative usage behavior in nursing information systems [D]. Zhengzhou University, 2020.