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ORIGINAL RESEARCH

Current Status and Factors Influencing Emergency Response Capability of Shared Nurses in the Internet + Nursing Service Model: A Descriptive Cross-Sectional Study

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Aim: To evaluate the existing level of emergency capabilities among shared nurses and analyze the factors influencing these capabilities.

Methods: An descriptive cross-sectional survey was conducted from September to October 2023, a purposive sampling method was employed to select 340 shared nurses as the subjects for investigation in Nanchang and Ganzhou cities of Jiangxi Province, as well as Wenzhou city in Zhejiang Province. A self - designed questionnaire on the emergency capabilities of shared nurses was utilized for data collection.

Results: This investigation encompassed the collection of 340 valid questionnaires, assessing the overall emergency response proficiency of shared nurses. The cumulative score amounted to (170.81±24.62), averaging (4.27±0.62). It is noteworthy that the dimension scoring the highest was preparedness (4.33±0.68), whereas the recovery capability dimension received the lowest score (4.17±0.75). Through multiple linear regression analysis, it was determined that marital status, participation in emergency capability training, and experience in home nursing services significantly influenced the emergency capabilities of shared nurses ($P<0.05$).

Conclusion: Shared nurses in China demonstrate a moderately high level of emergency response capability. The marital status, participation in emergency capacity training, and on-site nursing service experience are pivotal factors influencing the emergency capabilities of shared nurses. Nursing administrators should prioritize the development of emergency capacity training and team building for shared nurses, establishing a scientifically standardized mechanism for training, assessment, and management. The implementation of performance evaluation mechanisms for shared nurses is crucial to enhance professional awareness within the workforce.

Keywords: shared nurses, internet + nursing services, emergency capability, cross-sectional study, influencing factors analysis

Introduction

According to the most recent data from the World Health Organization (WHO), it is projected that by 2030, one-sixth of the global population will be 60 years of age or older.[1] Mirroring the global demographic shift, China is undergoing a rapid process of population aging. By November 2020, China had reached a milestone with 264 million people aged 60 and above, accounting for 18.70% of the total population. Among this group, approximately 65% are dealing with chronic diseases, making elderly individuals with chronic conditions a significant concern in both healthcare and society.[2] The existing medical resources and care service models have proven inadequate to meet the escalating demand.[3,4] In this context, the Chinese government has issued notifications in both 2019 and 2020 to drive forward the implementation of pilot projects for "Internet Plus Nursing Services". Additionally, the "National Plan for Nursing Development (2021–2025)" has identified the active promotion of these pilot initiatives as a critical focus. This underscores a strong commitment to actively encourage healthcare institutions to offer "Internet Plus Nursing Services".[5] "Internet Plus Nursing Services" represents a pioneering nursing service approach adopted by healthcare facilities. This approach

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leverages cutting-edge information technologies like the internet and the Internet of Things (IoT) to deliver health education and specialized nursing services to patients in their homes through a blend of "online applications" and "offline services".[6] Being an emerging industry, "Internet Plus Nursing Services" has the capability not only to mitigate the issue of unequal distribution of nursing resources in Chinese hospitals but also to fully exploit the professional value of nurses and propel the expansion of the nursing services sector. As the main actors delivering "Internet Plus Nursing Services". Nurses delivering Internet-based nursing services hold a chief nursing qualification and boast over 5 years of clinical work experience. these nurses utilize internet information platforms to provide in-home nursing services to patients during their off-duty hours. This involvement is regarded as a supplementary professional pursuit for hospital nurses, and this collective is commonly identified as shared nurses.[7] The research indicates that shared nurses face significant constraints in effectively addressing disease treatment and care, particularly when dealing with unexpected situations during home visits. These challenges are primarily a result of their independent work nature, the unpredictable home environments, and the shortage of medical equipment.[8] The data shows that 75% of unexpected medical incidents occur during home nursing services, with 70.6% of home visit nurses reporting incidents of workplace violence.[9] Data from the Centers for Disease Control and Prevention in the United States indicate that among nurses providing home-based services, 13% have encountered adverse events, 20% to 33% have experienced issues related to medications and adverse drug reactions, and 35% of nurses have been injured by sharp objects at least once during home care.[10] When faced with unforeseen situations, 66.99% of nurses are not aware of safety measures to protect themselves and their patients.[11] This underscores the relatively high occurrence rate of sudden events in the context of Internet Plus Nursing Services, and the limited emergency preparedness capabilities of shared nurses.

Emergency capability pertains to the capacity to address and manage unforeseen urgent situations. When individuals encounter sudden emergencies, the brain instinctively processes them based on past experiences and self-awareness, operating within the realm of the subconscious. This phenomenon is integral to the subconscious domain, wherein the brain reflexively employs prior knowledge and self-awareness to navigate unexpected circumstances.[12] Nursing emergency capability is defined by a nurse's acute ability to observe and analyze changes in a patient's condition during clinical nursing duties. It encompasses the application of refined nursing skills and the capacity to calmly and decisively collaborate in emergency rescue efforts.[13] Shared nurse emergency capabilities represent a holistic combination of competencies, comprising the requisite knowledge, skills, attitudes, behaviors, and qualities. These capabilities empower shared nurses in the context of home nursing to identify potential risks for both patients and themselves, promptly detect changes in a patient's condition, and proficiently handle emergency medical tasks.[14] The study reveals that shared nurse emergency capabilities exert a positive influence on users' sustained intent to use and their satisfaction with "Internet Plus Nursing Services".[15] These capabilities represent a pivotal element within the risk management framework of "Internet Plus Nursing Services" and have a direct bearing on patient safety. Furthermore, they impact the quality and efficiency of home nursing practices. Elevating the emergency capabilities of shared nurses is an essential prerequisite for ensuring the structured and sound development of "Internet Plus Nursing Services".[16] Current research primarily emphasizes risk response strategies and safety management at the organizational level within hospitals, while the emergency response capabilities of shared nurses, who serve as the primary providers of "Internet Plus Nursing Services", have received relatively limited attention.[17] Consequently, based on the assessment index system for shared nurse emergency capabilities previously established by our research team, we crafted a dedicated survey questionnaire to assess the current state of shared nurse emergency capabilities in China. The primary goal was to analyze the contributing factors and provide valuable input for the formulation of targeted training programs.

Materials and Methods

Study Design

A descriptive cross-sectional design was used in a survey study conducted from September 2023 to October 2023.

Participants

In September and October 2023, shared nurses were chosen as the subjects of the survey in Nanchang and Ganzhou cities, Jiangxi Province, as well as in Wenzhou City, Zhejiang Province, China. This selection was made using a purposive sampling method.

Inclusion Criteria:① Possession of a valid nursing license within its expiration date.② Clinical nursing experience of ≥5 years, Registered Nurse or higher.③ Inclusion in the shared nurse database of the "Internet Plus Nursing Services" information platform after hospital approval.④ Voluntary participation in this research.

Exclusion Criteria: Nurses not currently on active duty, including those on maternity or paternity leave, as well as nurses pursuing external educational studies.

Utilizing the sample size estimation method relevant to variable influencing factors, it is advisable to have a minimum sample size of at least ten times the number of independent variables.[18] With 16 predictor variables under consideration and a provision for a 15% non-response rate, the sample size must meet or exceed 184 cases.

A total of 340 shared nurses were surveyed. 8 individuals with a vocational education (2.35%), 52 with an associate degree (15.29%), 271 with a bachelor's degree (79.71%), and 9 with a graduate degree (2.65%); 88 staff nurses (25.88%), 203 head nurses (59.71%), 43 deputy chief nursing officers (12.65%), 6 chief nursing officers (1.76%). In terms of emergency response training, 245 (72.06%) participants had undergone training, while 95 (27.94%) participants had not; Only 131 (38.53%) individuals had accepted and provided home care services, while 209 (61.47%) individuals had not. Detailed demographic information is provided in Table 1.

Table 1 Demographic Characteristics of the Shared Nurses (n=340)

Variables	Grouping	N	%
Age	<30	65	19.12
	30–39	197	57.94
	40–49	62	18.24
	≥50	16	4.71
Sex	Female	334	98.24
	Male	6	1.76
Education level	Technical secondary school	8	2.35
	Junior College	52	15.29
	Undergraduate	271	79.71
	Postgraduate and above	9	2.65
Professional Title	Registered Nurse	88	25.88
	Chief Nurse	203	59.71
	Deputy Director of Nursing	43	12.65
	Director of Nursing	6	1.76
Position	No	245	72.06
	Yes	95	27.94
Marital status	Unmarried	40	11.76
	Married	296	87.06
	Others	4	1.18
Years of work experience	5–10	64	18.82
	11–15	140	41.18
	16–20	55	16.18
	>20	81	23.82
Department	Internal Medicine	104	30.59
	Surgery	123	36.18
	ICU	18	5.29
	Emergency Department	22	6.47
	Others	73	21.47

(*Continued*)

Table 1 (Continued).

Variables	Grouping	N	%
Hospital level	Tertiary Hospital	271	79.71
	Secondary Hospital	68	20.00
	Primary Hospital	1	0.29
Specialized Nurse Qualification Certificate	No	259	76.18
	Yes	81	23.82
Emergency Capability Training Experience	No	95	27.94
	Yes	245	72.06
Experience in Home Nursing Services	No	209	61.47
	Yes	131	38.53

Survey Tools

In this study, a cross-sectional survey was conducted utilizing both a general information questionnaire and a survey questionnaire specifically designed to assess the emergency capabilities of shared nurses.

General Information Questionnaire

Formulated through the project team's prior literature analysis and the outcomes of semi-structured interviews, the general information survey questionnaire was designed independently.[19] Following consultation with experts, the questionnaire encompasses details such as age, gender, education level, professional title, job position, marital status, years of work experience, department affiliation, hospital grade, possession of specialized nursing qualifications, participation in emergency capability training, and experience in providing in-home services.

Emergency Capability Survey Questionnaire Design

Following the structured framework set by our research group, we devised an assessment system to evaluate the emergency capabilities of shared nurses. Employing a comprehensive methodology that involved literature analysis, semi-structured interviews, the Delphi expert consultation method, and the Analytic Hierarchy Process, this system comprises four primary indicators: prevention capability, preparedness capability, response capability, and recovery capability. These are further subdivided into 13 secondary indicators and 40 tertiary indicators. Using the detailed information derived from the third-level indicators, we developed a survey questionnaire for a nationwide inquiry into the emergency capabilities of shared nurses.[17] The preliminary survey results indicate that the questionnaire exhibits robust reliability and validity, with a Cronbach's α coefficient of 0.983, the Cronbach's α coefficients for each dimension were consistently above 0.90, a split-half reliability of 0.916, the Spearman-Brown coefficients for each dimension consistently exceeded 0.90, item-level content validity (I-CVI) ranging from 0.79 to 1.00, and a Scale-level Content Validity Index (S-CVI/Ave) of 0.97[20] (Table 2).

Table 2 The Cronbach's α Coefficients and the Split-Half Reliabilities for the Questionnaire

Dimensions	Items	Cronbach's α Coefficient	Spearman-Brown Coefficient
Prevention capability	16	0.954	0.906
Preparedness capability	6	0.948	0.929
Response capability	14	0.970	0.950
Recovery capability	4	0.959	0.949
Overall questionnaire	40	0.983	0.916

The questionnaire consists of four dimensions: prevention capability (16 items), preparedness capability (6 items), response capability (14 items), and recovery capability (4 items), encompassing a total of 40 items. Encompassing expertise in the field, first aid proficiency, additional pertinent knowledge and skills, training and exercises, professional ethics, equipment preparedness, risk management, emergency response capabilities, organizational management skills, self-safety protocols, effective communication and coordination, summary and continuous improvement, psychological adjustment. It utilizes a 5-point Likert scale, where responses range from "excellent" to "very poor", corresponding to scores from 5 to 1. The scores for the Prevention Capability dimension, Preparedness Capability dimension, Response Capability dimension, and Recovery Capability dimension are 80, 30, 70, and 20 points, respectively, resulting in a total score of 200 points, with higher scores signifying stronger shared nurse emergency capabilities.

Procedures

The self-designed questionnaire was uploaded to the online platform powered by www.wjx.cn. Nursing managers responsible for the study shared the questionnaire's QR code or link within their respective workgroups on WeChat. Nurses anonymously completed the questionnaire and submitted it. Quality control measures were implemented through the Wenjuanxing platform, ensuring that each IP address and WeChat account could only complete the questionnaire once. Moreover, respondents were required to spend more than 5 minutes completing the questionnaire, and they had to fill out all questionnaire sections before submission. This study has obtained ethical approval from the Biomedical Ethics Subcommittee of the Academic Committee of Nanchang University (Approval No.: NCUREC202310004).

Data Analysis

Data entry and statistical analysis were conducted using SPSS 23.0. Descriptive statistics, such as means and standard deviations, were employed for continuous data, while frequency and proportion were used for categorical data. To compare the differences in shared nurse emergency capability scores among groups with different characteristics, *t*-tests or analysis of variance were applied. Multiple linear regression analysis was utilized to determine the influencing factors of shared nurse emergency capabilities. Statistical significance was defined as $P < 0.05$.

Results

The Present State of Emergency Capabilities Among Shared Nurses

Due to the varying number of questions in each dimension, standard scores were utilized for a consistent representation. This involved computing the mean score divided by the total score, ensuring a more intuitive depiction of the results. The collective score for shared nurse emergency capabilities amounted to (170.81±24.62) points, the standard scores (85.41 ±12.31), The scores for the four dimensions of prevention capability, preparedness capability response capability and recovery capability were (68.16±9.81),(26.00±4.08),(59.97±9.26), (16.68±2.99), the standard scores are as follows: (85.20±12.26),(86.67±13.60),(85.67±13.23),(83.40±14.95), preparedness capability achieved the highest score, whereas recovery capability received the lowest score. (Figure 1, Table 3). The lowest average scores for five specific items can be found in Table 4.

Univariate Analysis Results of Shared Nurse Emergency Capabilities

The emergency capabilities of shared nurses demonstrated statistically significant associations with their educational background, job position, marital status, years of work experience, participation in emergency training, and experience in home nursing services ($P < 0.05$). Nurses with a bachelor's degree achieved the highest scores, with married individuals scoring higher than their unmarried counterparts. Additionally, nurses in administrative roles outperformed those without such responsibilities. Noteworthy is the finding that nurses with 16–20 years of work experience attained the highest scores, and those who underwent emergency training or participated in home-based services also demonstrated elevated performance. Further details can be found in Table 5.

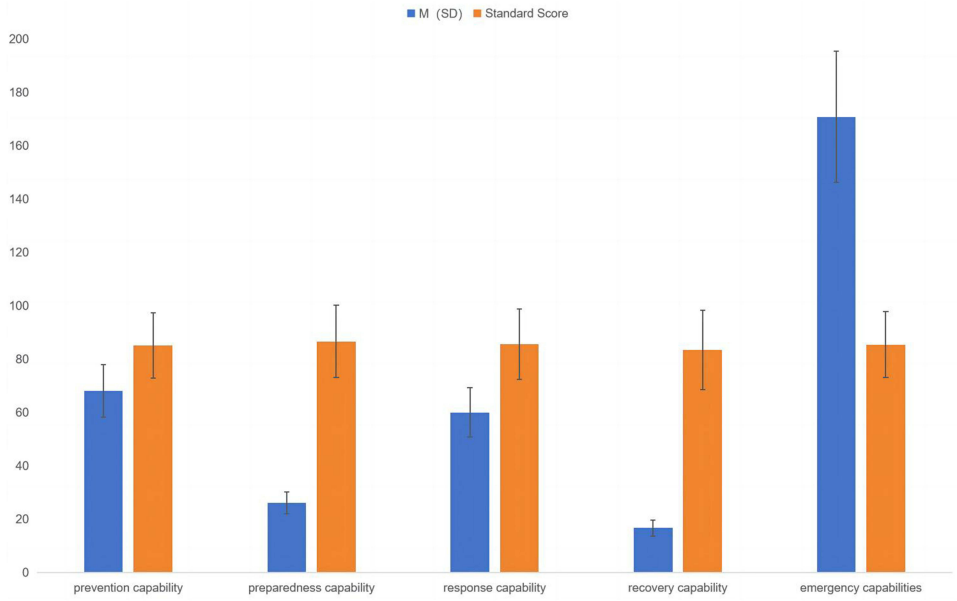

Figure 1 The emergency capabilities score of 340 shared nurses.

Multifactor Analysis Results of Shared Nurse Emergency Capabilities

Multivariate linear regression analysis was conducted with the shared nurse emergency capabilities score as the dependent variable. The analysis included variables that showed statistically significant differences in the univariate

Table 3 Emergency Response Capability Total Score and Dimension Scores of Shared Nurses (n=340)

Items	Min	Max	Score ($\overline{X} \pm S$)	Standard Score ($\overline{X} \pm S$)
Prevention Capability Dimension	38	80	68.16±9.81	85.20±12.26
Preparedness Capability Dimension	13	30	26.00±4.08	86.67±13.60
Response Capability Dimension	23	70	59.97±9.26	85.67±13.23
Recovery Capability Dimension	8	20	16.68±2.99	83.40±14.95
Total Score	101	200	170.81±24.62	85.41±12.31

Table 4 The Five Lowest-Scoring Items in the Emergency Response Capability of Shared Nurses (n=340)

Dimension	Items	Average Score ($\overline{X} \pm S$)
Prevention Capability	Regular Participation in Emergency Drills for 'Internet Plus Nursing Services	3.81±1.04
	Regular Participation in Emergency Capability Training for 'Internet Plus Nursing Services	3.91±1.01
	Acquiring a thorough comprehension of the legal and regulatory aspects pertaining to "Internet Plus Nursing Services" and possessing the capability to identify and address potential legal issues	3.95±0.87
	Proficiency in managing emergencies related to animal bites and scratches	3.98±0.87
	Proficiency in regulations, policies, and job responsibilities pertinent to Internet-based nursing services	4.09±0.87

Table 5 Univariate Analysis Results of Emergency Response Capability in Shared Nurses (n=340)

Items	N	Average Total Score ($\overline{X} \pm S$)	Prevention Capability ($\overline{X} \pm S$)	Preparedness Capability ($\overline{X} \pm S$)	Response Capability ($\overline{X} \pm S$)	Recovery Capability ($\overline{X} \pm S$)
Age						
<30	65	4.09±0.64	4.05±0.64	4.12±0.73	4.13±0.68	4.03±0.77
30–39	197	4.32±0.62	4.32±0.60	4.39±0.68	4.32±0.68	4.19±0.77
40–49	62	4.33±0.54	4.32±0.57	4.40±0.60	4.33±0.59	4.27±0.66
≥50	16	4.21±0.63	4.20±0.66	4.23±0.64	4.25±0.64	4.11±0.65
F value		2.547	3.403	3.017	1.455	1.158
p value		0.056	**0.018**	**0.03**	0.227	0.326
Sex						
Female	334	4.26±0.62	4.25±0.61	4.33±0.68	4.28±0.66	4.16±0.75
Male	6	4.64±0.41	4.67±0.45	4.47±0.60	4.65±0.39	4.75±0.32
t value		−1.494	−1.644	−0.505	−1.387	−1.928
p value		0.136	0.101	0.614	0.166	0.055
Education level						
Technical secondary school	8	4.02±0.72	3.98±0.73	4.10±0.69	4.04±0.74	4.03±0.76
Junior College	52	4.15±0.59	4.11±0.61	4.21±0.62	4.19±0.60	4.08±0.68
Undergraduate	271	4.31±0.60	4.31±0.60	4.38±0.67	4.33±0.65	4.20±0.75
Postgraduate and above	9	3.89±0.82	3.97±0.68	3.87±0.98	3.79±1.04	3.92±0.96
F value		2.725	2.820	2.636	2.821	0.817
p value		**0.044**	**0.039**	0.050	**0.039**	**0.485**
Professional Title						
Registered Nurse	88	4.20±0.63	4.17±0.64	4.27±0.66	4.23±0.66	4.14±0.74
Chief Nurse	203	4.28±0.63	4.27±0.62	4.35±0.71	4.29±0.68	4.17±0.78
Deputy Director of Nursing	43	4.35±0.53	4.38±0.52	4.38±0.59	4.34±0.58	4.21±0.66
Director of Nursing	6	4.36±0.49	4.45±0.55	4.22±0.54	4.35±0.55	4.25±0.39
F value		0.668	1.432	0.397	0.365	0.123
p value		0.572	0.233	0.756	0.778	0.947
Position						
No	245	4.23±0.64	4.20±0.64	4.29±0.71	4.25±0.68	4.13±0.77
Yes	95	4.39±0.54	4.41±0.52	4.45±0.59	4.36±0.60	4.27±0.67
t value		−2.348	−3.081	−2.174	−1.405	−1.559
p value		**0.020**	**0.002**	**0.031**	0.161	0.120
Marital status						
Unmarried	40	4.01±0.63	3.97±0.67	4.09±0.70	4.04±0.65	3.91±0.72
Married	296	4.30±0.61	4.30±0.59	4.36±0.67	4.31±0.66	4.20±0.74
Others	4	4.41±0.67	4.13±1.22	4.54±0.57	4.63±0.58	4.56±0.88
F value		4.323	5.524	3.017	3.545	3.200
p value		**0.014**	**0.004**	0.05	**0.030**	**0.042**
Years of work experience						
5–10	64	4.13±0.69	4.09±0.70	4.19±0.76	4.17±0.69	4.06±0.78
11–15	140	4.24±0.65	4.22±0.62	4.31±0.72	4.26±0.71	4.13±0.79
16–20	55	4.50±0.47	4.51±0.45	4.57±0.53	4.51±0.52	4.34±0.67
>20	81	4.28±0.55	4.28±0.58	4.33±0.60	4.27±0.60	4.21±0.67
F value		3.905	5.044	3.290	2.856	1.658
p value		**0.009**	**0.002**	**0.021**	**0.037**	0.176
Department						
Internal Medicine	104	4.24±0.64	4.24±0.65	4.31±0.72	4.26±0.69	4.09±0.80
Surgery	123	4.25±0.63	4.23±0.62	4.33±0.66	4.26±0.68	4.18±0.73
ICU	18	4.54±0.42	4.52±0.45	4.60±0.51	4.54±0.50	4.47±0.65
Emergency Department	22	4.20±0.58	4.21±0.57	4.15±0.66	4.25±0.60	4.10±0.68
Others	73	4.30±0.61	4.29±0.59	4.37±0.69	4.30±0.65	4.22±0.72

(*Continued*)

Table 5 (Continued).

Items	N	Average Total Score ($\bar{X} \pm S$)	Prevention Capability ($\bar{X} \pm S$)	Preparedness Capability ($\bar{X} \pm S$)	Response Capability ($\bar{X} \pm S$)	Recovery Capability ($\bar{X} \pm S$)
F value		1.030	1.007	1.193	0.772	1.203
p value		0.392	0.404	0.314	0.544	0.309
Hospital level						
Tertiary Hospital	271	4.29±0.62	4.28±0.62	4.34±0.68	4.30±0.67	4.18±0.75
Secondary Hospital	68	4.21±0.59	4.18±0.58	4.31±0.69	4.22±0.64	4.14±0.74
Primary Hospital	1	3.85±0.00	3.75±0.00	4.00±0.00	3.86±0.00	4.00±0.00
F value		0.698	1.179	0.188	0.625	0.097
p value		0.498	0.309	0.829	0.536	0.908
Specialized Nurse Qualification Certificate						
No	259	4.29±0.62	4.26±0.62	4.34±0.69	4.32±0.67	4.20±0.75
Yes	81	4.21±0.59	4.24±0.61	4.29±0.66	4.17±0.63	4.07±0.72
t value		1.025	0.267	0.584	1.749	1.367
p value		0.306	0.789	0.559	0.081	0.173
Emergency Capability Training Experience						
No	95	4.08±0.63	4.03±0.60	4.17±0.70	4.11±0.70	4.02±0.78
Yes	245	4.34±0.59	4.35±0.60	4.40±0.66	4.35±0.64	4.23±0.73
t value		−3.619	−4.427	−2.801	−2.976	−2.261
p value		**<0.001**	**<0.001**	**0.005**	**0.003**	**0.024**
Experience in Home Nursing Services						
No	209	4.23±0.64	4.20±0.64	4.29±0.71	4.25±0.68	4.13±0.77
Yes	131	4.39±0.54	4.41±0.52	4.45±0.59	4.36±0.60	4.27±0.67
t value		−4.258	−4.933	−4.333	−3.038	−3.176
p value		**<0.001**	**<0.001**	**<0.001**	**0.003**	**0.002**

Notes: Values in bold indicate if a *p* value<0.05, denoting statistical significance. And a *p* value>0.05, denoting statistical not significance.

Table 6 Multivariate Linear Regression Analysis of the Average Scores of Shared Nurse Emergency Response Capability (n=340)

Independent Variables	B	SE	β	t	P	Tolerance	VIF
(Constants)	3.157	0.267	–	11.837	**<0.001**	–	–
Education level	0.006	0.068	0.005	0.091	0.927	0.929	1.076
Position	0.061	0.085	0.045	0.72	0.472	0.713	1.403
Marital status	0.209	0.103	0.117	2.03	**0.043**	0.827	1.210
Years of work experience	−0.016	0.038	−0.027	−0.412	0.681	0.646	1.548
Emergency Capability Training Experience	0.218	0.074	0.159	2.952	**0.003**	0.946	1.057
Experience in Home Nursing Services	0.206	0.07	0.163	2.944	**0.003**	0.894	1.118
R^2				0.087			
ΔR^2				0.071			
F				5.286			
p				**<0.001**			

Notes: Values in bold indicate if a *p* value<0.05, denoting statistical significance. And a *p* value>0.05, denoting statistical not significance.

analysis (P < 0.05) as independent variables. The results revealed that marital status, participation in emergency training, and experience in home nursing services were all significantly associated with nurse scores (P < 0.05). Details can be found in Table 6.

Discussion

In this study, the overall score for shared nurse emergency capabilities was (170.81±24.62) points, with the average scores (4.27±0.62) points, indicating a relatively high level. This contrasts with the findings of Zhong et al[21] whose research on self-assessment of nurses' emergency capabilities in Internet+ nursing service pilot hospitals in Guangzhou reported an average emergency capability score of (3.57±0.65), placing it at a moderate level. A potential reason for this discrepancy lies in the composition of the surveyed shared nurses in this study, the majority of whom were highly experienced and skilled nursing professionals. Notably, 74.12% held the position of head nurse or above. Previous finding shave consistently shown that nurses with titles of head nurse or higher exhibit significantly superior emergency capabilities compared to their counterparts with lower titles ($P < 0.01$).[22] This underscores the notion that individuals with higher professional titles tend to possess heightened emergency capabilities, rendering them more adept in dealing with unforeseen emergency situations.

In the four dimensions, the preparedness dimension emerged with the highest score (86.67±13.60), a noteworthy deviation from prior research findings.[23] This discrepancy can be attributed to the relatively straightforward and secure nature of the current on-site service procedures, primarily catering to discharged patients from our institution. Nurses, being intimately acquainted with the patients' medical histories, exhibit a heightened level of confidence in self-assessing their preparedness, particularly in terms of proficiency in equipment preparation and patient condition assessment abilities. The resilience dimension recorded the lowest score (83.40±14.95), aligning with findings from prior research.[24] This outcome can be primarily attributed to the emerging nature of the Internet+ nursing services industry. Due to the limited frequency of nurses conducting home visits, the occurrence of emergency events is relatively low. This scarcity in practical experience in dealing with unforeseen circumstances has left many practitioners in a learning phase, resulting in a diminished capacity for related scientific research.

Among all the items, the five items with the lowest scores are all within the prevention dimension, indicating that shared nurses might have comparatively weaker preventive capabilities. This observation aligns with findings from prior research.[25,26] A more detailed examination reveals that shared nurses may encounter difficulties in grasping knowledge about legal regulations, rules, and emergency plans related to Internet + nursing services. Additionally, their infrequent participation in regular training sessions and emergency drills for Internet + nursing services could be attributed to the early stage of development for Internet + nursing services in China. At this phase, the industry is still in the exploratory stage, and comprehensive legal frameworks, standardized training norms, and assessment mechanisms are yet to be fully developed.[27] In contrast, there has been considerable research conducted abroad in this field. Gershon et al devised a home safety risk screening checklist coupled with a corresponding training program. They implemented training for 57 home care nurses, with results demonstrating the effectiveness of the training program in improving nurses' ability to identify home safety risks and mitigate the impact of unforeseen events.[28] Therefore, it is recommended that relevant authorities enhance legal regulations and regulatory oversight, establish industry standards, nursing quality control systems, and medical risk prevention mechanisms. Additionally, it is crucial to formulate service norms, legal regulations, and create processes for dispute resolution, emergency response, and reporting unforeseen events. These efforts are essential to genuinely protect the rights of nurses and standardize their practices. At the same time, establish a comprehensive family risk assessment checklist and formulate a scientific, standardized evaluation index system, along with training programs for the emergency capabilities of shared nurses. Relevant regulatory authorities should implement a unified assessment mechanism and regularly conduct emergency training and drills for shared nurses, aiming to build a skilled and adaptable workforce and continuously improve the quality and standards of Internet-based nursing services.

The outcomes of multiple linear regression analysis indicate that marital status is a determinant factor affecting the emergency capabilities of shared nurses. Married nurses exhibit relatively stronger emergency capabilities, aligning with previous research findings.[21] This association may be attributed to the social experiences and enhanced interpersonal skills acquired by married nurses. Their increased proficiency in managing family relationships and communicating with the elderly contributes to a wealth of experience. In emergency situations, married nurses demonstrate effective conflict communication skills and adept on-The-spot adaptability, allowing them to handle crises more efficiently. Hence, encouraging experienced and retired nurses to join the service workforce can alleviate the shortage of nursing personnel

while safeguarding the quality and safety of home nursing care.[29] Furthermore, in the current investigation, nurses who regularly attended emergency capacity training exhibited higher scores in emergency capabilities, consistent with prior research findings.[30] The systematic emergency capacity training not only improves the quality of nursing services but also strengthens the ability of shared nurses to respond urgently and handle emergencies in unforeseen circumstances. It represents an essential measure to safeguard nursing safety and reduce the incidence of adverse events in a home environment.[31] Therefore, it is recommended that the Health Commission takes the lead in collaboration with nursing and medical experts to formulate training standards and assessment systems tailored to the unique nursing environment and conditions. Drawing inspiration from the construction plans of specialized nurse training bases, innovative training models and mechanisms should be introduced. Leveraging internet platforms and utilizing virtual simulation technology can help simulate various emergency situations in a home environment. Conducting regularized emergency training and drills will effectively enhance the emergency capabilities and confidence in the rescue of shared nurses. At length, the experience of providing home nursing services emerges as a significant factor influencing the emergency response capabilities of shared nurses, aligning with findings from prior research.[32] Engaging in home nursing services not only enhances their confidence in service delivery but also equips them with valuable knowledge and skills for effective treatment interventions. This experience enables shared nurses to respond promptly and adeptly in emergency situations. Nonetheless, the survey has revealed that the willingness of shared nurses to provide home-based services is modest, with just 37% expressing a readiness to accept assignments. This reluctance is attributed to the nurses' limited awareness of policies regarding internet-based nursing services and a perceived imbalance between income and rewards.[33] As a result, it is recommended that governmental authorities utilize diverse and multi-channel communication strategies to disseminate policies, guide public opinion effectively, strengthen nurses' professional identity, and facilitate the interpretation of policy highlights within the medical community. Additionally, expediting the establishment of incentive mechanisms, implementing performance evaluation systems for shared nurses, and linking internet-based nursing services with performance assessments, professional title advancements, and commendations will contribute to increased enthusiasm and a heightened sense of professional value among practitioners.

Conclusions

In conclusion, the emergency response capabilities of shared nurses are generally above average; however, certain shortcomings persist, particularly in the areas of preventive and recovery capacities. Nursing managers and educators should prioritize the enhancement of shared nurses' knowledge, skills, and understanding of regulatory frameworks. Additionally, proactive strategies aimed at addressing nurses' psychological well-being are crucial. Marital status, regular participation in emergency preparedness training, and hands-on experience in home nursing services collectively contribute to heightened emergency response capabilities among shared nurses. Consequently, nursing managers should institute comprehensive mechanisms for emergency preparedness training, assessment, and management. The normalization of emergency training programs and drills is imperative, complemented by the implementation of incentive structures. Establishing performance evaluation systems for shared nurses is vital to enhance professional awareness and instill a sense of value. Purposive sampling was employed in this study, and the representativeness of the samples has certain limitations. It is recommended that future research expands to a larger, multicenter sample to provide a more comprehensive basis for developing scientifically effective intervention strategies.

Data Sharing Statement

The authors are willing to provide the data from this study upon reasonable request.

Ethics Approval and Consent to Participate

This study adhered to the principles outlined in the Helsinki Declaration and received ethical approval from the Biomedical Ethics Subcommittee of the Academic Committee at Nanchang University (Approval No. NCUREC202310004). Participants were informed about the research objectives before the study commenced and had the right to withdraw or terminate their participation at any point. The study maintained strict confidentiality and anonymity measures for participant information, ensuring that all collected data were handled in a manner that preserved anonymity.

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Disclosure

The authors affirm that no conflicts of interest exist in the course of this work.

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