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Research Paper

Geriatric nursing competence of clinical nursing staff at different hospital levels in Chongqing, China: A cross-sectional study

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ABSTRACT

Objectives: This study aimed to survey the geriatric nursing competencies of clinical nursing staff in Chongqing City, China, and provide suggestions to enhance these competencies.
Methods: This study was conducted in 204 hospitals in Southwest China from December 24, 2022 to January 7, 2023. The "Geriatric Nursing Competence of Clinical Nurse Investigation Tool" was used to explore factors that influence geriatric nurses' competencies via stratified sampling. The survey was conducted by distributing and collecting questionnaires through the online platform *Wenjuanxing*.
Results: A total of 10,692 nurses answered the questionnaires. Of these questionnaires, 9,442 were valid. The total geriatric nursing competence score of the clinical nursing staff was 2.29 ± 0.81, the secondary hospital score was 2.23 ± 0.78, and the tertiary hospital's overall mean score was 2.33 ± 0.83. The factors that influenced secondary hospitals included the department of medicine, age of nurses and total length of career ($P < 0.05$). The factors that influenced tertiary hospitals included the department of medicine, age of nurses, nurses' professional title, and geriatric practical advanced nurses' certification ($P < 0.05$).
Conclusions: Geriatric nursing competence among clinical nursing staff is imbalanced at a lower-middle level and is influenced by various factors. The findings highlight the need for further clinical training in geriatric nursing. The training of geriatric nurses should focus on necessary clinical skills and on preparing them to adequately manage comprehensive geriatric syndromes.

What is known?

- The quality of geriatric nursing care plays a crucial role for older patients and exerts a significant impact on clinical quality, patient safety, and patient health outcomes.
- To date, surveys of geriatric nursing competence have mainly concentrated on geriatric advanced practice nurses, nurses working in geriatric departments, or community nurses in China.
- There is a lack of comprehensive and representative investigations of geriatric nursing competence among all clinical nursing staff working at different hospital levels in Chongqing City, China.

What is new?

- The overall geriatric nursing competence of clinical nursing staff in Chongqing City is at a medium-low level and is influenced by multiple factors.

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- The development of geriatric nursing care is imbalanced in various dimensions. Professional practical competence and professional development competencies are particularly poor.
- Hospital classification is an influencing factor for the overall geriatric nursing competence of clinical nursing staff, but the disparity between secondary hospitals and tertiary hospitals is relatively small.

1. Introduction

According to the WHO statistics [1], the world's population is living longer. The number of older people is increasing worldwide and estimated to double between 2015 and 2050. As the world's second-largest economy, China faces significant healthcare challenges due to its rapidly aging population, which is the largest globally [2]. It is predicted that there will be a substantial surge in older people by 2050, with over 400 million individuals aged $\geq$ 65 [3]. China has entered an era of population aging. As this trend continues, pressure on public healthcare systems will increase [2].

The aging situation in Chongqing City is particularly concerning. Chongqing City is located in Southwest China and is the economic center of the upper reaches of the Yangtze River [4]. Chongqing City has a substantial number of older people, with the number of individuals aged $\geq$ 65 surpassing 5.47 million and 1.03 million individuals aged $\geq$ 80 at the end of 2020, ranking second in the country and first in Southwest China [5]. This indicates a severe aging situation. At the same time, the average life expectancy in Chongqing City during the same period was 79.3 years [6], and the healthy life expectancy for this demographically healthy population is estimated to be 69.2 years; therefore, ten years of survival is associated with disease in old age [5]. A previous study revealed that hospitalized patients in Chongqing City primarily consisted of individuals aged $\geq$ 60 years due to chronic diseases (55.3%) [7]. Additionally, there is a significant proportion (7.7%) of disabled older individuals among the total older population in Chongqing City, with 43 million individuals aged $\geq$ 65 years [6].

Frailty, sarcopenia, weight loss, and dementia are highly prevalent geriatric syndromes observed in older persons across various care settings [8], and symptoms of new diseases or the worsening of existing diseases may be underrecognized [9]. The provision of geriatric nursing care is closely linked to ensuring patient safety [10]. These activities include the identification and prevention of potential safety issues that may arise during treatment [11]. The quality of geriatric nursing care plays a crucial role for older patients and has a significant impact on clinical quality, patient safety, and patient health outcomes [12]. The American Geriatric Surgery Verification noted the important role of nurses in improving surgical outcomes in older persons [13]. Older patients are increasingly frail and characterized by comorbidities, polypharmacy, and cognitive failure [14]. These effects demand increasingly advanced nursing competence in geriatrics, psychiatry, psychology, pharmacology, communication and ethics. Professional competence is a key issue when providing quality healthcare services [14,15]. However, a lack of geriatric nursing qualifications, insufficient high-quality geriatric nursing services, and failure to provide early identification of the manifestations of functional decline in older patients can result in insufficient treatment of older patients and can increase readmission rates, early entry into long-term care, the complexity of community care, and the burden on the health care system [16,17]. Considering the high prevalence of geriatric syndromes in older persons, the use of geriatric nursing competencies for the adequate management of these syndromes will contribute to improving the quality of life of this population.

However, previous research [18] has focused primarily on other aspects, such as geriatric advanced practice nurses, nurses working in geriatric departments, and community nurses in China. Additionally, the sample sizes of these surveys were relatively small. Our knowledge of the geriatric nursing competencies of clinical nursing staff in Chongqing City is limited. This is presumably because of the lack of comprehensive and representative investigations of geriatric nursing competence among clinical nursing staff in secondary and tertiary hospitals, which may fail to improve the quality of geriatric nursing care.

This study aimed to investigate and evaluate geriatric nursing competence among clinical nursing staff in secondary and tertiary hospitals in Chongqing City to allow us to propose a highly targeted program for enhancing nursing skills in this area.

2. Methods

2.1. Study design and participants

A cross-sectional study was conducted in Chongqing City, southwestern China, including 204 secondary and tertiary hospitals. These hospitals were strategically positioned across three key regions of Chongqing City: the Main Metropolitan area, the Three Gorges area in northeast Chongqing City, and the Wuling Mountain area in southeast Chongqing City.

To be eligible, nurses were enrolled in this survey if they: a) were certified registered nurses; b) worked full-time and had at least one year of clinical nursing experience in hospitals and c) provided informed consent and volunteered to participate in this study. Nurses who were off duty during the survey period were excluded. A total of 10,692 registered nurses participated in the investigation, and 9,442 questionnaires were valid, which resulted in an effective response rate of 88.3%.

2.2. Study sample

We selected 10% of the nurses from the relevant departments of medicine to respond to this survey. The specific methods are as follows.

(a) All nurses working in geriatric hospitals, geriatric medicine departments, and general medicine departments participated in this survey.
(b) The remaining departments in which elderly hospitalizations accounted for more than 40% of hospitalizations were chosen based on 10% of the total number of nurses. Sampling based on the percentage of nurses' professional titles in the Health Statistics Yearbook released in Chongqing 2022 [19]. Among them, senior professional titles accounted for 10%, intermediate professional titles accounted for 30%, and junior professional titles accounted for 60%. If a department did not have any nurses with senior professional titles, all nurses with intermediate professional titles were selected along with the corresponding proportion of junior professional titles (to ensure that the number of selected nurses was not less than 10% of the total number of nurses in that department).

2.3. Research instruments

2.3.1. Sociodemographic information questionnaire

This questionnaire collected information on demographic characteristics, including gender, age, location of administrative area, hospital classification, department of medicine, education level, professional title, total length of career, and whether the

participants obtained a geriatric advanced practice nurses (GAPNs) certification.

2.3.2. Geriatric nursing competence of clinical nurses

The "Geriatric Nursing Competence of Clinical Nurses" scale was developed by a Chinese research team in Guangdong Province [20]. It was used to evaluate the geriatric nursing competence of clinical nursing staff. The scale comprised 43 first-level items and ten secondary items in three dimensions (Appendix A). The researchers emailed the authors and obtained permission to use the questionnaire. The questionnaire was reliable, with a Cronbach's α coefficient of 0.978 for overall reliability and a Cronbach's α coefficient of 0.912 − 0.966 for the three dimensions. Responses were rated on a five-point Likert scale ranging from 0 to 4, corresponding to "completely disagree," "disagree," "partially agree," "agree," and "strongly agree," respectively. The scores for each dimension and the total score were calculated as the mean score. Scores below 2 were considered low-level abilities, scores of 2 − 3 were considered moderate-level abilities, and scores above 3 were considered high-level abilities.

2.4. Data collection

The study questionnaire was distributed and collected from participants through the online platform *Wenjuanxing* (access www.wjx.cn). All content was presented as an electronic questionnaire that was given a unique QR code linked to the survey website. The QR code was sent to the head nurse in each department by e-mail, WeChat, or in person. The head nurse was asked for assistance in distributing the survey questionnaires to the nurses. The inclusion and exclusion criteria were clarified. All participants provided informed consent before they began the survey. Upon completion of the questionnaire, the online platform *Wenjuanxing* automatically saved the survey data, and the platform leveraged the initial data. Finally, the data were manually screened and checked individually by two members of the research team to ensure the quality and completeness of the questionnaires.

2.5. Quality control

We used the online platform *Wenjuanxing* (access www.wjx.cn) to collect questionnaires from December 24, 2022 to January 7, 2023. Before the questionnaire was distributed, the following measures were taken: 1) all questions were set to be mandatory to ensure the integrity of the questionnaires; 2) only one response from an IP was allowed to avoid duplicate responses; and 3) the received questionnaires were examined and screened to remove low-quality questionnaires as well as questionnaires with the same score for all options; 4) the questionnaire response period was two weeks. The completed questionnaires were analyzed by the researchers for inclusiveness and correctness.

2.6. Ethical considerations

All nurses involved in this survey signed an informed consent form, and the study was approved by the Ethics Committee of the First Affiliated Hospital of Chongqing Medical University (2021-386). Informed consent was obtained from the nurses after the study's aim was clarified. Confidentiality and anonymity were guaranteed by allocating a code number for each questionnaire. Nurses were guaranteed that the data would be used only for research purposes. The right to withdraw from the study was confirmed.

2.7. Statistical analysis

The general characteristics of the participants were analyzed using frequency analysis (%). Quantitative data were analyzed using descriptive statistics (means and standard deviations). The baseline data between groups were compared using Independent samples *t*-test, and ANOVA was used for comparison between multiple groups. The factors that influenced the competence of clinical nursing staff members in geriatric nursing were analyzed using multiple regression analysis. All analyses were performed with IBM SPSS Statistics for Macos Version 26.0 (IBM Corp., "IBM SPSS", Armonk, NY, USA), and $P < 0.05$ was considered to indicate statistical significance.

3. Results

3.1. General characteristics of the participants

A total of 10,692 questionnaires were used in this survey. We received a total of 9,442 valid questionnaires, for an effective response rate of 88.3%. Among the participating nurses, the majority were female. Their average age was 32.2 years, and the majority were young and middle-aged (< 40 years, 86.4%). Most held a junior professional title (68.8%) and had earned a bachelor's degree (69.4%). More than half (55.7%) of the participants came from tertiary hospitals. The other details of the participants in secondary and tertiary hospitals are presented in Tables 1 and 2.

3.2. The levels of geriatric nursing competence

The total score of geriatric nursing competence was 2.29 ± 0.81 for the clinical nursing staff, which was an intermediate difference. The total score was 2.23 ± 0.78 in secondary hospitals, and 2.33 ± 0.83 in tertiary hospitals surpassing that of secondary hospitals ($P < 0.001$). In the first-level items, "professional cultural competence" had the highest score, followed by "practical competence", "professional development competence" had the lowest score across both secondary and tertiary hospitals. Among the second-level items, "law and ethics" and "critical thinking" ranked highest, whereas "professional learning competence" and "research and innovation" ranked lowest (Table 3). Regarding the third-level items, "proficient in the applicable laws and regulations pertaining to elderly care and execute nursing practices in accordance with established requirements" was identified as having the greatest likelihood of supporting nursing practices according to established requirements. Conversely, the lowest was "can actively engage in research and development of innovative nursing technology and products specifically designed for the elderly" (Appendix B).

3.3. Differences in geriatric nursing competence by general characteristics

The performance of the participants varied based on their characteristics. In the 204 included hospitals, age, administrative area, department of medicine, total length of career, professional title, and GAPNs certification influenced the geriatric nursing competence of the clinical nursing staff. The overall mean scores were found to be higher among individuals with higher education levels, older age, longer lengths of careers, and higher professional titles. Moreover, gender emerged as a significant factor in secondary hospitals but not in tertiary hospitals, whereas hospital classification played a significant role in tertiary hospitals but not in secondary hospitals (Tables 1 and 2).

3.4. Factors influencing geriatric nursing competence

To determine the factors that influence geriatric nursing competence, we performed multiple regression analyses using statistically significant general characteristics. The analysis revealed that age, department of medicine, and total length of career were found to have significant effects on the geriatric nursing competence of nurses who came from secondary hospitals (Table 4). However, the factors that influenced tertiary hospitals were slightly different. The results revealed that age, department of medicine, professional title, and acquired GAPNs certification influenced geriatric nursing competence (Table 5). Two regression equations were statistically significant.

4. Discussion

Older patients often present with comorbidities, experience functional decline or even complete impairment, exhibit atypical clinical symptoms, and encounter communication challenges. Consequently, early detection and appropriate treatment of significant geriatric syndromes are crucial. Geriatric nurses must attain the necessary competencies to deliver optimal care [21]. However, the overall competence of geriatric nursing is moderately lower in Chongqing City than in Beijing City [22]. This may be because Beijing City is more developed than Chongqing City, and its overall medical level is the highest in China. The study of Beijing City focused only on hospitals in the main metropolitan area, whereas our study focused on hospitals from both the main metropolitan area and the remote region.

In Chongqing City, among the three dimensions, only the score for “professional cultural competence” was relatively high, while the scores for “practical competence” and “professional development competence” were comparatively lower. Practical nursing competence is closely tied to the safety of older patients. Common issues in geriatric clinical nursing, such as choking, aspiration pneumonia, delirium, frailty, and atypical manifestations of acute exacerbations of chronic diseases, demand that nurses possess strong professional practice competencies for early detection and recognition. However, the professional practice competence of clinical nursing staff in geriatric nursing care in Chongqing City is below average, significantly impacting nurses’ ability to provide high-quality systematic assessment and observation of older patients’ conditions and exacerbating potential clinical risks [23].

Professional development competence is vital for nurses’ career advancement and planning and serves as the driving force for gerontological nursing. This survey revealed that it is the lowest of the three dimensions and has the weakest performance in scientific research and innovation, in alignment with previous studies of geriatric nurses in China [24,25]. Given the escalating challenge of an aging population and the substantial health requirements of older people coupled with the proactive backdrop of promoting the “Healthy China 2030” plan, exploring strategies to foster the balanced development of geriatric nursing in Chongqing City is an important topic for nursing research.

There are three dimensions of geriatric nursing competence, and the level of each item is determined by the scores of its subitems. Although the overall score for “professional cultural competence” was higher than the other two dimensions, the scores of the second-level items “identify existing or potential older patient abuse problems promptly” and “aware of the ethical principles of caring for older patients and applying them to nursing practice” were also relatively low. Elder abuse has become a global public health and social problem [26], but clinical nursing staff members still have insufficient consciousness and recognition of this issue. The rate of accurate identification of potential elder abuse among Chinese undergraduate nursing students is less than 50%, particularly with regard to identifying neglect [27]. Previous studies have also indicated that the capacity of healthcare professionals, including doctors, nurses, medical students, and other relevant groups, to recognize elder abuse is limited. This limitation may be influenced by their level of caregiving experience and educational background [28]. The ethical principles of geriatric nursing hold significant implications for guiding clinical decision-making, particularly given the declines caused by aging and the exploration of the meaning of life. Halter et al. [29] emphasized that practitioners and healthcare professionals in the field of geriatrics should possess not only extensive clinical diagnostic and treatment knowledge but also a profound understanding of ethical patient care.

Comprehensive geriatric assessment for older persons can provide a comprehensive evaluation of medical, psychological, social, and physical functions [30]. It is a core skill that all geriatric nurses must master. The intricate and multifaceted characteristics of diseases in older patients necessitate the implementation of a comprehensive geriatric assessment [31]. These assessment results could serve as the basis for clinical medical personnel to develop diagnosis, treatment, and nursing plans for older patients. However, in clinical practical competence for geriatrics, knowledge, skills, practice items related to comprehensive geriatric assessment, and the competence to identify changes in disease conditions and handle them clinically, such as the third-level items 12 − 18, had lower scores than other items. The geriatric nursing competence of clinical nursing staff in Chongqing City, including the use of standardized assessment tools to identify geriatric syndromes, develop personalized nursing plans for older patients, dynamically adjust nursing plans based on changes in patient conditions, and identify and handle typical and atypical presentations of critical and chronic illnesses in older patients, is unevenly developed compared to other abilities. Early identification of and intervention in geriatric syndromes is imperative for facilitating patients’ recovery and enhancing patients’ overall health and lifespan. Prompt diagnosis and treatment of acute or subacute health conditions in older patients, coupled with appropriate rehabilitation measures, can effectively mitigate further functional decline and hospital readmission [32]. In this context, it is imperative for clinical nursing staff in Chongqing City to enhance their proficiency in geriatric assessment and the identification and management of acute and critical conditions among older patients.

In this study, the scores for the third-level items 28 − 30, which related to health education competence, were consistently lower than those of other items in both secondary and tertiary hospitals. The acquisition of knowledge and skills serves as the fundamental basis for nurses to provide high-quality health education to patients and plays a pivotal role in enhancing patients’ recovery levels and overall quality of life [33]. The research revealed that the relatively mediocre health education competence of clinical nursing staff in Chongqing City may be related to their lower clinical knowledge and skills. Given that gerontological nurses are not only caregivers and therapists but also educators, consultants, and innovators [34], comprehensive improvements to geriatric nursing competence are urgently needed. This requires not only enhancing nurses’ clinical practice competence to effectively address various clinical problems in older patients in a timely and efficient manner but also fostering their professional development competence to promote the healthy development of gerontological nursing. Furthermore, nurses should improve their professional literacy competence to better understand aging and aging-related issues and implement humanistic care in nursing practice. The provision of health education serves as an essential approach to improving older patients’ health behavior and augmenting their

Table 1
Differences in geriatric nursing competence according to the general characteristics of secondary hospitals ($n = 4,110$).

Variables	Categories	Secondary hospital, n(%)	Scores	t/F	P
Gender	Male	70 (1.70)	2.69 ± 0.54	54.714 [a]	<0.001
	Female	4,040 (98.30)	2.81 ± 0.59		
Age (years)	≤ 25	751 (18.27)	2.68 ± 0.53	8.845 [b]	<0.001
	26 − 30	1,493 (36.33)	2.75 ± 0.58		
	31 − 35	1,019 (24.79)	2.83 ± 0.53		
	36 − 40	444 (10.80)	2.89 ± 0.57		
	> 40	403 (9.76)	3.21 ± 0.54		
Administrative area	Main urban area	2,468 (60.05)	2.83 ± 0.57	7.418 [b]	<0.001
	Northeast of Chongqing City	944 (22.97)	2.80 ± 0.58		
	Southwest of Chongqing City	698 (16.98)	2.80 ± 0.58		
Department of medicine	ICU	378 (9.20)	2.71 ± 0.57	28.835 [b]	<0.001
	Gynecology	206 (5.01)	2.77 ± 0.51		
	Geriatrics	224 (5.45)	2.87 ± 0.50		
	General internal medicine	1,378 (33.53)	2.84 ± 0.62		
	Internal medicine specialty	612 (14.89)	2.69 ± 0.53		
	General surgery	458 (11.14)	2.85 ± 0.58		
	Surgical specialty	662 (16.11)	2.84 ± 0.60		
	Otorhinolaryngology	192 (4.72)	2.83 ± 0.56		
Total length of career (years)	< 3	545 (13.26)	2.62 ± 0.59	86.51 [b]	<0.001
	3 − 5	820 (19.98)	2.71 ± 0.56		
	6 − 10	1,275 (31.02)	2.77 ± 0.57		
	> 10	1,470 (35.77)	2.96 ± 0.56		
Educational level	Associate's degree or below	1,674 (40.73)	2.75 ± 0.59	55.286 [b]	<0.001
	Bachelor's degree	2,432 (59.22)	2.85 ± 0.58		
	Master's degree or above	4 (0.09)	2.91 ± 0.33		
Professional title	Junior	3,024 (73.63)	2.75 ± 0.58	55.271 [b]	<0.001
	Middle	936 (22.77)	2.96 ± 0.57		
	Senior	150 (3.65)	3.04 ± 0.57		
GAPNs certification	No	3,954 (96.20)	2.81 ± 0.58	55.537 [a]	<0.001
	Yes	156 (3.80)	2.89 ± 0.63		

Note: Data are n(%) and *Mean* ± *SD*. GAPNs = geriatric advanced practical nurses. [a] *t*-test; [b] ANOVA.

Table 2
Differences in geriatric nursing competence according to the general characteristics of tertiary hospitals ($n = 5,332$).

Variables	Categories	Tertiary hospital, n (%)	Scores	t/F	P
Gender	Male	126 (2.36)	2.69 ± 0.52	38.144 [a]	0.002
	Female	5,206 (97.64)	2.84 ± 0.57		
Age (years)	≤ 25	607 (11.38)	2.64 ± 0.58	32.107 [b]	<0.001
	26 − 30	1,715 (32.15)	2.74 ± 0.56		
	31 − 35	1,486 (27.87)	2.86 ± 0.54		
	36 − 40	787 (14.76)	2.92 ± 0.55		
	> 40	737 (13.82)	3.25 ± 0.51		
Administrative area	Main urban area	3,982 (74.68)	2.86 ± 0.54	21.028 [b]	<0.001
	Northeast of Chongqing City	1,108 (20.78)	2.84 ± 0.58		
	Southwest of Chongqing City	242 (4.54)	2.82 ± 0.56		
Department of medicine	ICU	451 (8.46)	2.77 ± 0.61	27.836 [b]	<0.001
	Gynecology	199 (3.73)	2.76 ± 0.61		
	Geriatrics	504 (9.45)	2.87 ± 0.53		
	General Internal Medicine	1,500 (28.13)	2.84 ± 0.58		
	Internal Medicine Specialty	805 (15.10)	2.81 ± 0.60		
	General Surgery	597 (11.20)	2.83 ± 0.55		
	Surgical Specialty	935 (17.53)	2.85 ± 0.57		
	Otorhinolaryngology	341 (6.40)	2.85 ± 0.53		
Total length of career (years)	< 3	608 (11.40)	2.64 ± 0.58	26.831[b]	<0.001
	3 − 5	972 (18.23)	2.72 ± 0.55		
	6 − 10	1,495 (28.04)	2.79 ± 0.59		
	> 10	2,257 (42.31)	2.97 ± 0.56		
Educational level	Associate's degree or below	1,092 (20.48)	2.76 ± 0.57	62.317 [b]	<0.001
	Bachelor's degree	4,179 (78.38)	2.86 ± 0.57		
	Master's degree or above	61 (1.14)	2.92 ± 0.64		
Professional title	Junior	3,446 (64.63)	2.76 ± 0.56	62.740 [b]	<0.001
	Middle	1,582 (29.67)	2.95 ± 0.56		
	Senior	304 (5.70)	3.15 ± 0.56		
GAPNs certification	No	5,148 (96.55)	2.83 ± 0.57	63.241 [a]	<0.001
	Yes	184 (3.45)	3.15 ± 0.62		

Note: Data are n(%) and *Mean* ± *SD*. GAPNs = geriatric advanced practical nurses. [a] *t*-test; [b] ANOVA.

health literacy, thereby serving as a tangible demonstration of nurses' clinical competence.

Quality management, leadership and education, professional learning, and research and innovation competence are important

Table 3
The geriatric nursing competence score for the clinical nursing staff in secondary and tertiary hospitals.

Variables		Secondary hospitals	Tertiary hospitals	*t/F*	*P*
Total score		2.23 ± 0.78	2.33 ± 0.83	8.886	<0.001
First-level items	Professional cultural competence	2.35 ± 0.66	2.42 ± 0.72	−6.736	<0.001
	Practical competence	2.27 ± 0.80	2.39 ± 0.84	−2.071	<0.001
	Professional development competence	2.07 ± 0.87	2.18 ± 0.92	−1.719	0.082
Second-level items	Law and ethics	2.37 ± 0.70	2.43 ± 0.76	−6.689	<0.001
	Critical thinking	2.33 ± 0.60	2.40 ± 0.66	−6.726	<0.001
	Professional knowledge	2.31 ± 0.62	2.38 ± 0.67	−6.555	<0.001
	Clinical practice	2.28 ± 0.79	2.38 ± 0.94	−1.061	0.278
	Safety management	2.27 ± 0.80	2.39 ± 0.85	−1.061	0.364
	Communication and consultation	2.24 ± 0.81	2.40 ± 0.84	−0.901	0.584
	Quality management	2.18 ± 0.84	2.38 ± 0.89	−1.017	0.298
	Leadership and education	2.11 ± 0.88	2.29 ± 0.93	−0.541	0.583
	Professional learning competence	2.07 ± 0.90	2.19 ± 0.94	−0.352	0.724
	Research and innovation	1.94 ± 0.85	2.05 ± 0.90	−0.333	0.732

Note: Data is *Mean* ± *SD*.

Table 4
Factors influencing competence in geriatric nursing at a secondary hospital.

Variables	*B*	*SE*	*β*	*t*	*P*	*VIF*
Constant	2.273	0.147	–	15.471	<0.001	–
Administrative area	0.012	0.012	0.016	1.027	0.305	1.032
Gender	0.037	0.068	0.008	0.540	0.589	1.015
Department of medicine	0.018	0.005	0.059	3.889	<0.001	1.014
Educational level	0.016	0.020	0.014	0.792	0.428	1.293
Professional title	0.010	0.023	0.009	0.420	0.674	1.939
GAPNs certification	0.067	0.046	0.022	1.443	0.149	1.006
Age	0.012	0.002	0.165	7.948	<0.001	1.891
Total length of career (years)	0.121	0.031	0.096	3.886	<0.001	2.648

Note: $R^2 = 0.241$, $adjR^2 = 0.267$, $F = 25.617$. *SE* = *standard error*. *VIF* = variance inflation factor. GAPNs = geriatric advanced practical nurses.

components of professional development competence. The overall score for professional development competence was relatively low, and the scores for research and innovation competence were particularly low. Research and innovation competence is important for continuous discovery and problem-solving, exploring nursing methods, innovating nursing technologies, and improving the quality and efficiency of nursing work. The limited proficiency in geriatric clinical nursing practice among clinical nursing staff in Chongqing City may constitute a significant determinant that impacts their research and innovation capabilities in the field of geriatric nursing.

The survey showed that the geriatric nursing competence of clinical nursing staff in Chongqing City is influenced by multiple factors. Nurse's age is a common influencing factor in both secondary and tertiary hospitals. This could possibly be because geriatric nursing is a highly practical discipline. As nurses amass a greater breadth of clinical experience through exposure to diverse patients and cases, their proficiency in managing complex medical scenarios expands. This survey showed that the nurses who were older, those with more work experience, and those with a higher education level had higher scores on geriatric nursing competence.

Department of medicine is also a common influencing factor in both secondary hospitals and tertiary hospitals. According to the survey, Nurses in geriatric departments scored significantly higher than those in other departments; the overall geriatric nursing competence of nurses in other departments was relatively low. With the aging population, the number of hospitalized older patients and older surgical patients is increasing. Older patients who require nursing care are present in all departments except for pediatrics and obstetrics. Insufficient clinical nursing proficiency in geriatric care places a significant strain on the existing healthcare system. This situation emphasizes the critical need for nursing competence for optimal patient health outcomes [35]. Given the inadequate establishment of geriatric departments, enhancing specialized training programs for geriatric nurses has emerged as a pivotal approach to augmenting clinical nursing ability in nursing care.

There are some differences between secondary hospitals and tertiary hospitals. The level of clinical nursing proficiency in care for older patients varies depending on the level of the hospital. Clinical nursing staff in tertiary hospitals have significantly higher overall proficiency in care for older patients and in each dimension than nurses in secondary hospitals. At the same time, professional title, got GAPNs certification or not of nurses are the influencing factors in tertiary hospitals. This can be due to several reasons. First, tertiary hospitals are more attractive to job seekers than secondary hospitals, so nurses in tertiary hospitals are likely to possess superior educational qualifications compared to nurses in secondary hospitals [36]. Second, a previous study showed that for every 1% increase in the number of nurses with a bachelor's degree, the patient mortality rate decreases by 4% [37], and nurses' educational

Table 5
Factors influencing competence in geriatric nursing at a tertiary hospital.

Variables	*B*	*SE*	*β*	*t*	*P*	*VIF*
Constant	2.673	0.205	–	18.451	<0.001	–
Administrative area	−0.007	0.014	−0.007	−0.516	0.606	1.016
Gender	0.032	0.051	0.008	0.631	0.528	1.030
Department of medicine	0.017	0.004	0.056	4.179	<0.001	1.037
Educational level	0.020	0.019	0.014	1.006	0.315	1.178
Professional title	0.078	0.017	0.081	4.460	<0.001	1.886
GAPNs certification	0.179	0.042	0.057	4.263	<0.001	1.015
Age	0.008	0.001	0.116	7.455	<0.001	1.390
Total length of career (years)	0.053	0.03	0.035	1.788	0.074	2.253

Note: $R^2 = 0.270$, $adjR^2 = 0.268$, $F = 33.389$. *SE* = *standard error*. *VIF* = variance inflation factor. GAPNs = geriatric advanced practical nurses.

qualifications exhibit a positive correlation with their clinical competence [38]. Consistent with the results of other researchers [39].

Although the number of clinical nursing staff in tertiary hospitals is greater than the number in secondary hospitals, the disparity is relatively small. This may be because many new tertiary hospitals have been established in the last five years in Chongqing City, and the nursing teams in these hospitals have not yet accumulated proficiency in geriatric care due to the short time since their establishment. Furthermore, Chongqing City has not yet conducted large-scale training for professional nurses specializing in elderly care. Therefore, in this survey, the clinical nursing staff in tertiary hospitals did not show a significant difference from those in secondary hospitals in terms of their professional practice and development abilities for geriatric care.

The aging population is a global issue, and all elderly people are likely to face problems such as functional decline, multiple coexisting diseases, or multiple geriatric syndromes; it is necessary for global nurses to have strong geriatric nursing competence to promote healthy aging.

5. Limitations

There were some limitations to this study. First, the sample was selected to include only secondary and tertiary hospitals, and community hospitals were not surveyed. Second, the survey was limited to Chongqing City in southwest China and lacked a survey of other provinces and cities. Additionally, the questionnaires for this study were all collected online, and although there is one nurse was assigned to charge the survey in every hospital, there was no face-to-face explanation for the nurses who participated in this survey.

6. Implication to clinical practice

As China's aging continues to deepen, the geriatric nursing competence of clinical nurses in Chongqing City is still at a medium-low level, and high-quality nursing talents are still scarce. Hence, it is imperative to develop training implementation strategies that align with the needs of clinical nurses to enhance the geriatric nursing capacity. Administrators should focus on developing the capacity of clinical nurses to recognize, assess, and determine geriatric syndromes to give more comprehensive care to older patients. On the other hand, clinical nurses should develop the capacity how to use standardized assessment tools, the development of individualized care plans, and the recognition of typical and atypical signs of acute and chronic illness in older adults. Furthermore, to improve professional development among clinical nurses, especially in geriatrics, relevant organizations or hospitals could make particular training plans to strengthen observation and problem-solving skills for clinical nurses.

7. Conclusion

Geriatric nursing competence among clinical nursing staff is assessed at a lower-middle level and is influenced by various factors. The findings of this study highlight the need for further clinical training in geriatric nursing for clinical nursing staff. Geriatric nursing education should focus on necessary clinical skills and preparing nurses to adequately manage comprehensive geriatric syndromes.

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Data availability statement

The datasets generated during and/or analyzed during the current study are available from the corresponding author upon reasonable request.

CRediT authorship contribution statement

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Declaration of competing interest

The authors declare no conflict of interest.

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Appendices. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijnss.2024.08.003.

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