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A Cross-Sectional Survey on Nurses' Utilization of Risk Assessment and Screening for Postoperative Delirium in Older Patients Following Hip Fracture Surgery in Tertiary Hospitals in Jiangsu Province, China

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Objective: To analyze the current utilisation of delirium risk assessment and screening for older patients after hip fracture surgery in tertiary hospitals in Jiangsu Province, China.

Methods: This cross-sectional study was conducted from April 1 to April 30, 2023 among nurses working in orthopedics from Level III hospitals in Jiangsu Province, China. Data were collected using a self-designed questionnaire that focused on the utilisation of delirium risk assessment and prevention measures for older patients after hip fracture surgery. The questionnaire was administered through the online platform Questionnaire Star. Differences between data were analyzed using chi-square and rank-sum tests.

Results: A total of 616 nurses from 48 hospitals in Jiangsu province responded to the survey. Among them, 50.17% reported having no training in delirium management, 66.88% did not assess patients for delirium risk, and 73.21% did not screen patients for delirium in their clinical practice. It was observed that nurses with longer tenure, nurses specialising in orthopaedics, and nurses with ICU experience were more attentive to delirium risk assessment and delirium screening of patients ($P<0.001$).

Conclusion: Medical institutions must focus on strengthening nurses' training in delirium management for older patients after hip fracture surgery, improve their ability to undertake risk assessment and risk screening, unify delirium management norms, and ultimately improve nurses' delirium management ability.

Keywords: risk assessment and screening, delirium, older patients, postoperative Hip fracture

Introduction

Hip fractures—the common type of fracture—have a poor prognosis and often require surgical intervention.[1] Older adults face a heightened risk of hip fractures, and the management of such fractures imposes a substantial economic burden on healthcare systems.[2–5] It is predicted that by 2025, the global number of hip fractures will increase to 2.6 million, and by 2050, it will further increase to 6.25 million.[6–8] There has been a growing trend in the incidence of hip fractures worldwide over the past few decades, about half of which are likely to occur in Asia and particularly in China.[7] One research study found that there were 190,560 hip fractures between 2012 and 2016 in urban China, with 83.42% of these cases occurring in individuals aged 65 years and older.[9]

Delirium is an acute geriatric syndrome characterised by a sudden onset of confusion and cognitive impairment.[10,11] It is considered one of the most common complications following hip fracture surgery in older patients.[12] Various factors

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contribute to the increased risk of postoperative delirium in this population, including advanced age, declining cognitive function, sensory impairments, severe pain, surgical stress, intraoperative blood loss, medications, infections and constipation.[13] The incidence of postoperative delirium among older hip fracture patients varies from 15% to 61%, with a reported incidence of 22.3% in China.[14] Delirium is associated with a higher risk of postoperative mortality, morbidity, poor functional outcomes, prolonged hospital stays, and increased healthcare costs.[15]

Appropriate patient management is imperative to minimise the occurrence and mitigate the negative effects of postoperative delirium. The British National Institute of Health and Care Excellence (NICE) (2017) stated that 30% of delirium cases are preventable.[16] Early identification and assessment of risk factors for delirium, as well as timely intervention, are key to preventing delirium. Relevant protocols that have been used increasingly in nursing care include assessment of cognitive function, prevention of hypoxia, pain management, prevention of polypharmacy, and maintenance of fluid-electrolyte balance.[17] Nurses who have frequent contact with patients at the bedside are in an optimal position to notice early changes in their physical and mental status. Nurses play a crucial role in identifying risk factors for delirium and providing care for patients who are at risk for it.[18,19] However, one study found that 44% of healthcare professionals lacked delirium knowledge.[20] A lack of education and training among nurses in clinical settings where delirium is prevalent has been found to be correlated with underdiagnosis of the condition, according to multiple studies.[21,22] The primary obstacles to routine delirium screening are attributed to healthcare professionals being unfamiliar with the screening tools and lacking knowledge in this area.[21]

The purpose of this study is to evaluate and analyze the current utilisation of delirium risk assessment and screening for older patients after hip fracture surgery in tertiary hospitals within Jiangsu Province, China. The results from this study may provide important insights for healthcare institutions seeking to enhance the delirium management skills of nurses.

Materials and Methods

Participants

Convenience sampling was employed to conduct a cross-sectional study from April 1 to April 30, 2023. Sample sizes are typically calculated based on a ratio of 5 to 10 times the number of independent variables.[23] Considering an anticipated loss to follow-up rate of 20%, our initially confirmed sample size was 300. However, we determined that this sample size was likely insufficient. To minimize potential bias, we subsequently invited a total of 660 participants from 48 hospitals in Jiangsu Province to complete an online questionnaire. It is important to note that no formal sample size estimation was conducted for this study. The inclusion criteria for participants were registered nurses specifically working in orthopedics.

Questionnaire on Practice of Postoperative Delirium Following Hip Fracture Surgery

The questionnaire used in this study was designed by orthopedic physicians, orthopedic nurses, and anesthesiologists. It covered 25 items related to the management of postoperative delirium in hip fracture patients, such as risk factors, risk assessment tools, screening tools, and postoperative prevention measures, as delineated in Supplementary Material 1.

Procedures

The self-designed questionnaire was compiled through the online platform Questionnaire Star (www.wjx.cn), which is functionally equivalent to Amazon Mechanical Turk. Participants completed the questionnaire through the Chinese social media platform WeChat. A fully completed questionnaire was considered valid. All questionnaire responses were anonymous and confidential. This study was conducted in accordance with the principles of the Declaration of Helsinki and received approval from the ethics committee of Jiangsu Province Hospital (2022-SR-154).

Data Analysis

The raw data were downloaded from www.wjx.cn and analyzed using SPSS 22.0 (Chinese version). A significance level of $P<0.05$ was considered to denote statistical significance. Normally distributed continuous data were presented as mean±standard deviation, while non-normally distributed data were presented as median and interquartile range. Categorical data were presented as frequencies (n) and percentages (%). Differences between data were analyzed using chi-square and rank-sum tests.

Results

Sample Characteristics

A total of 650 questionnaires were distributed to 650 participants, and 616 valid questionnaires were finally collected from 616 participants (response rate: 94.77%). Table 1 shows 616 participant characteristics. 88.64% participants who completed the survey had a bachelor's degree, and 14.61% were orthopedic specialist nurses; 50.17% were not trained for delirium management, and 66.88% did not assess delirium risk. Furthermore, 73.21% of participants did not screen for post-op delirium in older patients after hip fracture surgery. Among the participants conducting delirium screening, 59.39% utilized the CAM.

Table 1 Characteristics of 616 Nurses Who Responded to the Survey

Sample Information	Number	Percentage
Tenure of nurses, yr		
<4	72	11.69
4–10	133	21.59
11–15	157	25.49
>15	254	41.23
Professional title		
Nurse	64	10.39
Nursing specialist	137	22.24
Head nurse	227	36.85
Deputy chief nurse	154	25.00
Chief nurse	34	5.52
Educational background		
College diploma	55	8.93
Bachelor's degree	546	88.64
Master's degree	15	2.43
Orthopedic specialist nurse		
Yes	90	14.61
No	526	85.39
ICU work experience		
Yes	197	31.98
No	419	68.02
Delirium management training		
Yes	307	49.83
No	309	50.17
Delirium risk assessment		
Yes	204	33.12
No	412	66.88
Delirium screening		
Yes	165	26.79
No	451	73.21
Delirium screening tool		
Confusion Assessment Method(CAM)	98	59.39
Nursing Delirium Screening Scale (Nu DESC)	37	22.42
Arousal, Attention, Abbreviated Mental Test-4, Acute Change (4AT)	30	18.18
Comprehensive prevention measures		
Yes	431	69.97
No	185	30.03
Prevention measures for dehydration, constipation, and		
Electrolyte abnormalities	400	64.94
Yes	216	35.06
No		

(*Continued*)

Table 1 (Continued).

Sample Information	Number	Percentage
Prevention measures for malnutrition		
Yes	235	38.15
No	381	61,85
Prevention measures for infection and fever		
Yes	449	72.89
No	167	27.11
Prevention measures for immobilization or restricted mobility		
Yes	221	35.88
No	395	64.12
Prevention measures for pain		
Yes	563	91.40
No	53	8.60

Comparison Among Tenure of Nurses

Table 2 shows that as the tenure of nurses increases, there is an increased emphasis on delirium management training for nurses (P=0.002) as well as on conducting delirium risk assessments (P<0.001) and screening older patients for delirium after hip fracture surgery (P<0.001). These increased opportunities for nurses to engage in training programs on delirium management can be attributed to their prolonged tenure in the field. As a result, nurses are becoming increasingly aware of the importance of delirium risk assessment and screening through training.

Comparison Among Orthopedic Specialist Nurses

Table 3 shows that compared with generalist nurses, orthopedic specialist nurses receive more delirium management training (P=0.001) and conduct delirium risk assessments and screening on postoperative patients in clinical settings more frequently (P=0.001 and P=0.001). In China, orthopedic nurse training includes delirium management as a core course, as a result, specialist nurses have higher awareness of postoperative delirium and are therefore more likely to conduct delirium risk screening and assessments on postoperative patients during their clinical work.

Comparison Among Nurses Who Have or Lack ICU Work Experience

Table 4 shows that compared with nurses who lack ICU work experience, nurses with ICU work experience more frequently conduct delirium risk assessments and screening on postoperative patients in clinical settings (P=0.001). Nurses with ICU work experience have a better understanding of delirium risk, as they frequently encounter cases of delirium in critical patients. These nurses gather delirium-related information, identify potential risk factors, and perform

Table 2 Comparison Among Tenure of Nurses

Sample Information	0~3 Year	4~10 Year	11~15 Year	>15 Year	χ^2	*P*
Delirium management training					14.392	0.002
Yes	28(38.89)	52(39.10)	86(54.78)	141(55.51)		
No	44(61.11)	81(60.90)	71(45.22)	113(44.49)		
Delirium risk assessment					19.647	<0.001
Yes	10(13.89)	37(27.82)	55(35.03)	102(40.18)		
No	62(86.11)	96(72.18)	102(64.97)	152(59.82)		
Delirium screening					28.215	<0.001
Yes	9(12.50)	32(24.06)	58(36.94)	106(41.50)		
No	63(87.50)	101(75.94)	99(63.06)	148(58.50)		

Table 3 Comparison Among Orthopedic Specialist Nurses

Sample Information	Specialist Nurse	Generalist Nurse	χ^2	*P*
Delirium management training			47.302	<0.001
Yes	75(83.33)	232(44.11)		
No	15(16.67)	294(55.89)		
Delirium risk assessment			115.203	<0.001
Yes	80(88.89)	116(22.39)		
No	10(11.11)	402(77.61)		
Delirium screening			152.193	<0.001
Yes	72(80.00)	93(17.68)		
No	18(20.00)	433(82.32)		

Table 4 Comparison Among Nurses Who Have or Lack ICU Work Experience

Sample Information	ICU Work Experience	No ICU Work Experience	χ^2	*P*
Delirium risk assessment			14.520	<0.001
Yes	86(43.65)	118(28.16)		
No	111(56.35)	301(71.84)		
Delirium screening			11.300	0.001
Yes	70(35.53)	95(22.67)		
No	127(64.47)	324(77.33)		

assessments and interventions to reduce the occurrence and exacerbation of delirium. Their experience enables them to better identify patients' delirium risks and take appropriate measures for prevention and management.

Discussion

The Importance of Delirium Risk Assessment and Screening After Surgery in Older Patients with Hip Fractures

Responding to the survey, only 49.83% of the surveyed nurses had received delirium management training, with less than 40% of nurses with 10 years of work experience or less having received such training. This suggests that healthcare institutions can strengthen delirium management training earlier in the course of the nurses career because it shows that nurses on shorter work experience have less exposure to delirium management training. Risk assessment and delirium screening after surgery in older patients with hip fractures are critical for optimal patient management. It is worth mentioning that the National Hip Fracture Database(NHFD) introduced post-operative delirium screening as a core Key Performance Indicator (KPI) for all hospitals since 2017, requiring that screening be performed within the first week after hip surgery.[24] Postoperative delirium is closely linked to various complications and negatively impacts the patient's recovery, leading to prolonged hospital stays and increased difficulties in recovery.[25,26] Conducting risk assessment and screening enables timely interventions to minimise the occurrence of these complications, aiding in identifying specific risk factors and types of delirium in patients, thus facilitating personalised care plans and targeted delirium management.[27,28] Other relevant data from the UK indicate that while many risk factors for delirium are often modifiable, making some cases preventable, these risk factors can be categorized at both the patient level and the organizational level. For example, the use of preoperative nerve blocks in hospitals may serve as a protective factor against the development of delirium.[29] By implementing assessment and screening protocols, delirium can be effectively managed, promoting better recovery outcomes and improved quality of life for patients. Therefore, it is vital to highlight the

importance of risk assessment and delirium screening after surgery in older patients with hip fractures, ensuring that healthcare teams prioritise enhanced care and management services.

The Impact of Tenure of Nurses on Delirium Risk Assessment and Screening

The findings of this study demonstrate that the nurses with longer tenure may possess an enhanced comprehension of the risk factors associated with delirium and are able to more accurately assess patients' risk, which is consistent with Zhou et al.[30] They may be more skilled at observing and identifying early signs of delirium in order to take appropriate intervention measures. Additionally, they may be more familiar with the correct use and interpretation of delirium screening tools. However, this does not necessarily mean that younger or less experienced nurses are unable to effectively assess risk and screen for delirium. Because delirium is a common complication in older patients, healthcare teams usually provide training and guidance to ensure that all nurses are knowledgeable about delirium recognition and assessment methods as well as the proper use of screening tools.[31,32] Furthermore, teamwork is crucial, there can be formal delirium management training for younger nurses when they join orthopaedic wards, conducted by the senior nursing specialists. Comprehensive training for nurses in delirium management should encompass an understanding of delirium's pathophysiology, practical instruction in screening tools, and early symptom recognition. Additionally, training must include evidence-based intervention strategies, effective communication with patients and families, and the importance of interdisciplinary collaboration. Incorporating case studies and simulation exercises enhances skill acquisition, while ongoing assessment mechanisms promote continuous improvement. This multifaceted approach equips nurses to effectively manage delirium, thereby improving patient outcomes.

The Impact of Orthopedic Specialised Nurses and Nurses with ICU Experience on Delirium Risk Assessment and Screening

This study suggests that orthopedic nurses with specialized training and nurses with intensive care experience have a better understanding of the risk factors for delirium and can more accurately assess patients' risk, which supports the findings of Weber et al.[33] Specialised orthopaedic nurses and nurses with ICU experience demonstrate greater attention and focus when it comes to awareness of delirium risk assessment and screening. Specialised orthopaedic nurses often have more exposure to older post-operative patients with hip fractures who are at a higher risk of delirium. They use their experience to quickly identify potential delirium symptoms and provide individualised care plans to minimise risk. Nurses in ICU undergo specialised training to understand the causes and treatment methods related to delirium, resulting in greater awareness. They are skilled at monitoring and evaluating patients, quickly recognising signs of delirium, and implementing necessary interventions to reduce risk. However, it is important to note that other nurses also possess awareness of delirium risk assessment and screening, albeit to a lesser extent than specialised nurses in orthopedics and ICUs. This suggests that there is a clinical need to cultivate more specialised orthopedic nurses and to encourage them to undertake learning and knowledge exchange in the ICU.

Limitations and Implications

This study has some limitations. First, as this work focused on the tertiary hospitals in Jiangsu Province, its sample may not be representative in other settings. Second, the study did not consider the differences between orthopaedic specialty hospitals and tertiary hospitals in its design, which may affect the research results. Future studies should attempt to explore the relationship between knowledge, attitude, and practice of nurses and postoperative delirium in older patients with hip fractures.

Conclusions

Our research found that nearly 70% of orthopedic nurses in tertiary hospitals did not conduct delirium risk assessment and screening for older patients after hip fracture surgery. Nurses with longer tenure, orthopedic specialised nurses and nurses with ICU experience are more likely to have the skills and knowledge necessary for delirium risk assessment and delirium screening. Medical institutions should prioritize the enhancement of nurses' training in delirium management

for older patients following hip fracture surgery. This could include improving their capacity to conduct risk assessments and screenings, unifying delirium management protocols, and ultimately enhancing nurses' ability to effectively manage delirium.

Ethics Statement

This study was conducted in accordance with the principles of the Declaration of Helsinki and received approval from the ethics committee of Jiangsu Province Hospital (2022-SR-154). Informed consent was obtained from all participants, and the confidentiality of participants' information was ensured throughout the study.

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Disclosure

All authors declare that they have no conflicts of interest.

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