

TO EVALUATE THE EFFECT OF NURSING SENSITIVE INDICATORS COMBINED WITH PDCA IN FALL PREVENTION OF HOSPITALIZED PATIENTS

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Abstract: Objective: To explore the effect of nursing sensitive indicators combined with PDCA in fall prevention of hospitalized patients. Methods: A total of 298 patients were enrolled from August 2023 to December 2023, all of whom were treated in 22 inpatient wards of our hospital. A survey on the implementation status of fall prevention measures for inpatients was conducted in August, and 147 inpatients were randomly selected as the control group. PDCA project was carried out according to the survey status. After the intervention, 147 patients were randomly investigated as the study group, and the relevant data were collected and compared and analyzed. Results: The average implementation rate of fall prevention measures in our hospital was 75.89%. Compared with the control group, the average implementation rate of fall prevention measures in the study group was 96.54%, the difference was statistically significant ($P < 0.01$), and the quarterly incidence of falls showed a downward trend. Conclusion: The incidence of falls shows a downward trend. At present, the use rate of fall risk assessment scale for hospitalized patients is high, but the implementation rate of corresponding fall prevention measures taken for each risk level is still not ideal. It is necessary for clinical nursing workers to change from assessor to executor and supervisor of measures implementation. PDCA method can be used to improve the implementation rate of fall prevention measures. The PDCA method can be used to improve the implementation rate of fall prevention measures, so as to prevent and reduce the occurrence of accidents such as patients falling down and falling off the bed.

Keywords: Fall; Risk assessment scale; Hospitalized patients; PDCA cycle

1 INTRODUCTION

Nursing sensitivity indicators (NSIs) are a series of indicators used to evaluate and improve the quality of care. The purpose of these indicators is to provide a standardized tool for care providers, managers, and policy makers to monitor and evaluate the quality and effectiveness of care services. Through the use of nursing sensitivity indicators, it is possible to ensure that nursing services can meet the needs of patients while improving patient satisfaction and the overall efficiency of nursing services. Since 2018, our hospital has used nursing sensitivity indicators to identify the key points in nursing quality evaluation. During this process, we noted that the outcome measure for Q1 2023 showed a 40% quarter-on-quarter increase in inpatient falls. Although the proportion of injuries caused by falls was 0%, the increase in frequency still aroused our great concern. This is because the Chinese Hospital Association has issued the 2022 version of the patient safety goals, and the prevention and reduction of unintentional injuries has been listed as one of the ten goals for patient safety [1]. Therefore, preventing and reducing the occurrence of accidents such as patient falls and falling out of bed is an important quality and safety improvement goal. Early and accurate detection of high-risk groups of falls and early prevention and intervention measures are of great significance for reducing falls and improving the quality of life of patients [2]. Further investigation found that in the quality control inspection of nursing safety, the number of defects in fall prevention was relatively high, which prompted our nursing safety group to start the PDCA project with the theme of fall prevention. Through preliminary data collection, it was found that there were many researches and implementations of fall risk assessment scales at home and abroad. The commonly used comprehensive fall risk assessment tools include the morse fall scale (MFS) and the st.thomas risk assessment tool in falling elderly Inpatients, STRATIFY), the elderly fall risk assessment scale (self - ratedfall risk questionnaire, FRQ), Hendrich II Fall risk assessment model (HFRM), Johns Hopkins Fall Risk Assessment Scale (JHFRAT), etc [3,4]., different assessment tools have their own focuses on assessment content and application scenarios. Although many fall risk assessment tools have been used in clinical practice, the effectiveness of fall prevention at home and abroad is not optimistic. Most of the fall prevention management strategies are led by medical staff. Foreign studies have shown that 3% to 20% of hospitalized patients fall at least once during hospitalization [5]. The data of the second quarter of 2023 from China's national nursing quality data platform showed that the incidence of falls in hospitalized patients in Classiii Grade A hospitals was 0.16‰ [6]. Therefore, the effective clinical application of fall risk assessment scale needs to be improved urgently, and there are few studies on the implementation of fall prevention measures that should be taken in the application of assessment scale. Therefore, this study aims to explore the root causes affecting the implementation of fall prevention measures by investigating the current situation of the implementation of fall prevention measures in hospitalized patients in our hospital. And the effect of preventive measures implementation intervention through the standardized and scientific cycle system of plan-do-check-action (PDCA) is reported as follows [7].

2 MATERIALS AND METHODS

2.1 General Information

The study was conducted around 22 wards. The study began in August 2023 and ended in December 2023, with a total of 294 subjects. The average age of the control group (52 males and 95 females) was (72.35±12.87) years old; The average age of the study group (62 males and 85 females) was (72.05±11.31) years old. The responsible nurses in 22 wards were trained to apply the fall risk assessment scale. After processing and analysis by statistical software, there was no significant difference in general data between the two groups ($P > 0.05$).

2.2 Methods

The most widely used fall risk assessment tool in our hospital is the Morse Fall Scale (MFS). The form evaluation content is shown in Table 1. The total score of the form is 125 points, < 25 points are low risk, 25-45 points are medium risk, > 45 points are high risk [8]. ① The corresponding nursing interventions for low-risk patients were as follows: a, fall prevention warning signs were placed in the high-risk areas such as bedside, dining area, toilet, bathroom and wristband; b place daily objects and call bell in a convenient location for patients; c factors to reduce the risk of falls, such as strength, balance and gait training to improve gait instability, and wearing appropriate length pants and non-slip shoes; d Environmental education: when using wheeled beds, wheelchairs and other instruments, the wheels should be locked when static; Lock, safety belt or guard-rail should be used when transferring. ② The corresponding measures for intermediate-risk patients were as follows: in addition to the corresponding measures for low-risk patients, the following measures were implemented: a, grading nursing regulations were implemented to determine the degree of care needed by patients and provide nursing care according to the implementation requirements; b guide the patient to gradually sit up and gradually get out of bed; c) inform patients that they should be accompanied by others during activities; And weekly environmental education. ③ The corresponding measures for high-risk patients were as follows: on the basis of the corresponding measures for medium-risk patients: a, put fall warning signs at the end of the bed, and strengthen the inspection (every hour); b, there should be 24-hour nursing care to keep the patients in the sight of the caregivers; c. When the caregiver leaves, he or she must ring the bell from the bed; d evaluate the effects and side effects of medications; e. Bedside handover of fall risk factors and implementation of fall prevention measures should be conducted in each shift.

2.2.1 Cross-sectional survey

The nursing safety PDCA cycle project was carried out in the hospital from August 2023. By reviewing the "fall prevention" section of the hospital's safety quality inspection from January to July 2023, the PDCA theme was determined to improve the implementation rate of fall prevention measures. Therefore, a total of 147 inpatients from 22 wards were randomly investigated before the implementation of PDCA. Cross-sectional survey was used, homogeneous collection was used, and unified implementation standards were used. According to the content of each item measure, it was defined as "implemented", and partially implemented/not implemented, it was defined as "not implemented". Implementation rate of fall prevention measures in hospitalized patients = (actual number of fall prevention measures in hospitalized patients examined/total number of fall prevention measures in hospitalized patients examined)×100%. The survey found that the average implementation rate of fall prevention measures was 75.89%, and there were great defects in the actual application of fall risk assessment scale in clinical practice, which needed to be improved. In view of the current situation of the survey, countermeasures were actively sought and effective PDCA cycle was carried out.

1.2.2 Implementation of PDCA cycle

Target values and improvement values were set based on the results of the current situation survey. Through brainstorming and PDCA team members scoring, we analyzed the reasons for the non-standardized implementation, integrated the main reasons, carried out qualitative interviews, and used the grounded theory-based extraction method of influencing factors to finally determine the real reasons, namely: (1) monitoring: related items were not included in the monitoring scope; ② nurses: lack of cognition; ③ Family members, patients and caregivers: lack of knowledge. According to the real cause, the relevant countermeasures were formulated and implemented, including the items were comprehensively included in the monitoring standards, education videos and brochures were made, regular training for nursing assistants, and a series of fall prevention courses were trained. The specific implementation and effects are as follows: The items were included in the monitoring scope on September 15, the members of the nursing safety team were trained, and the monitoring items were unified. The fall prevention measures were included in the key monitoring of the monthly nursing safety census and the daily night check. The implementation rate of fall prevention measures increased significantly from August 23 to September 30. The implementation rate of fall prevention measures increased from 75.90% to 93.40%. ② Produced education videos and pamphlets, a series of 13 education manuals, printed 6500 copies for distribution and use, and one education video, and randomly examined the feedback of clinical patients and their families on the education content. From September 30 to October 15, the implementation rate of fall prevention cooperation between patients and their families increased significantly, and the implementation rate of environmental education increased from 39.1% to 98.8%. The implementation rate of special person care increased from 64% to 71.6%. ③ Organized fall prevention course training, checked every night, and monitored the standardization of accompanying. From September 30th to November 10th, the implementation rate of "accompanied by designated

persons" increased from 71.6% to 79.5%. ④ In view of nurses' lack of knowledge about fall prevention, nursing safety group discussion was organized, and a series of fall prevention courses (10 courses) was formulated combined with the situation of our hospital. The safety group members were responsible for the teaching, and the site teaching and demonstration interaction were the main teaching methods. From September 30th to November 10th, the implementation rate of fall prevention measures increased from 93.6% to 96.1%.

After the implementation of the countermeasures, a cross-sectional survey was conducted on 147 hospitalized patients in 22 wards in December. The average implementation rate of fall prevention was 96.54% after the improvement, and the specific items of each measure were also significantly improved after the implementation of PDCA cycle. During the implementation of the above measures, the nursing safety fall prevention supervision group was established by the Nursing Safety Committee. The members of the group were 50 head nurses in the whole hospital. After unified training, the same daily and night supervision was carried out. The nurses were asked whether they knew the high-risk patients (especially the newly reported high-risk and extremely high-risk), the implementation of protective measures, the management of nursing workers, and the accompanying situation in their departments. Among them, the departments with high fall risk assessment ≥ 10 people only need to supervise 10 people at most, and the departments with < 10 people are all included in the supervision. And the photos were retained at 8 o'clock the next day and feedback to the head nurse by the nursing safety committee. The supervision method continued to be used and turned into normalization, and the relevant deduction points were implemented in the spot check of nursing safety and quality. In order to attract the attention of clinical nurses, nursing assistants, family members and patients to fall prevention. After the intervention, the awareness rate of nurses on patients with high risk of falling in the ward increased from 79% to 99.7%. In each quarter of 2023, the incidence of falls in hospitalized patients (number of falls in hospitalized patients in the same period/total bed days of hospitalized patients in the statistical period $\times 1000\%$) and the incidence of falls in hospitalized patients (number of falls in hospitalized patients in the same period/number of falls in patients recorded in the statistical period $\times 100\%$) showed a downward trend (see Table 1).

Table 1 Incidence of Falls in Hospitalized Patients

Time	The incidence of falls in hospitalized patients
Q1 2023	0.042 ‰
Q2 2023	0.026 ‰
Q3 2023	0.026 ‰
Q4 2023	0.013 ‰

2.3 Observation Indicators

The implementation rate of fall prevention measures in hospitalized patients was calculated as: (the number of items actually implemented/the total number of items that should be implemented) $\times 100\%$.

2.4 Statistical Methods

SPSS 24.0 software was used for statistical data analysis. $P < 0.05$ represented statistically significant difference.

3 Results

The implementation of fall prevention measures in hospitalized patients was counted and compared, as shown in Table 2.

Table 2 Comparison of the implementation of fall prevention measures in hospitalized patients ($\bar{x}\pm s$)

	Study group (n=147)	Control group (n=147)	P
Gender (male: female)	1:1.83	1:1.37	0.233
Age (years)	72.05 \pm 11.31	72.35 \pm 12.87	0.829
Adoption rate (%)	96.54 \pm 7.25	75.89 \pm 14.40	<0.01

4 DISCUSSION

4.1 Application Status of Fall Risk Assessment Scales

As the first link of fall prevention work, fall risk identification can identify the risk of falls in a wider range. Choosing the appropriate assessment tools can help to correctly assess the risk of falls in elderly inpatients, improve the accuracy

of fall risk screening, improve nursing safety vigilance, and take effective fall prevention measures. It is possible to reduce the fall risk of hospitalized patients, fall-related injuries and medical costs. Therefore, we should pay attention to the fall prevention nursing of hospitalized patients, reduce the incidence of falls, and protect the physical and mental health of patients [8,9,10]. This study analyzed the application status of fall risk assessment scales in hospitalized patients and found that although the application rate of fall risk assessment scales was high in clinical practice, there were still shortcomings in the actual implementation of fall prevention measures. The current situation survey showed that the average implementation rate of fall prevention measures was 75.9%, which showed that despite the wide application of assessment tools, there were still some gaps in the process of translating assessment results into actual nursing actions. This may be related to the nursing staff's understanding of the fall risk assessment scale, the lack of cognition of family members and patients on fall prevention knowledge, and the imperfect monitoring and implementation mechanism.

4.2 Effect of PDCA Cycle Intervention

By implementing PDCA cycle intervention, this study significantly improved the implementation rate of fall prevention measures in hospitalized patients. The average implementation rate of the study group after the intervention reached 96.54%, which showed that PDCA cycle was an effective quality management tool, which could promote the standardization and scientization of nursing measures. Through the continuous planning, implementation, inspection and processing cycle, the nursing team can find and solve the problems in the implementation process in time, so as to improve the quality of nursing and patient safety.

4.3 Guidance of Nursing Sensitive Indicators

Nursing sensitive indicators play a key role in monitoring and improving nursing quality. Through regular evaluation and feedback, we are able to detect potential problems in the nursing process in time and take preventive measures accordingly. By jointly focusing on and solving the problems reflected by nursing sensitive indicators, team members from different specialties can learn from and support each other to jointly improve the quality of care.

4.4 Significance for Clinical Nursing Work

The results of this study highlight the important role of clinical nurses in fall prevention, they are not only evaluators, but also the implementers and supervisors of the implementation of measures. Fall prevention should shift from clinical centered to patient centered, and pay attention to the participation of family members [11]. Through the application of PDCA cycle, the inherent problems that are easy to be ignored in clinical work are found, and nurses can monitor and improve the nursing process more systematically to ensure the safety of patients. This study also provides a feasible reference model for other medical institutions to improve the implementation of fall prevention measures.

5 CONCLUSION

Continuous monitoring of nursing sensitive indicators, combined with the actual clinical situation, and continuous optimization of nursing process and prevention strategies are the keys to achieve patient safety and improve the quality of nursing services. Based on the continuous monitoring of nursing sensitive indicators, this study found problems and focused on problems. Through the in-depth analysis of the application status of fall risk assessment scale for inpatients and the intervention of PDCA cycle, it was confirmed that PDCA cycle had a significant effect in improving the implementation rate of fall prevention measures. The results highlight the importance of nurses to translate the scale into practical action after assessment, and the core role of continuous quality improvement in patient safety management.

5.1 Education and Training for Nursing Staff, Patients, Family Members and Nursing Assistants

In the future, it is recommended to further standardize the application of fall risk assessment scale for hospitalized patients, especially the implementation of fall prevention measures corresponding to risk levels. Strengthening the education and training of these key groups to improve their cognition of fall prevention is the key to achieve better prevention effects.

5.2 The Importance of Family and Patient Feedback

This study found that although PDCA cycle was effective in improving the implementation rate of measures, the feedback of family members was insufficient after the implementation of education. Family members are important participants in the daily care of patients, and their observation and feedback are essential for identifying and resolving the risk of falls. Therefore, it is recommended to establish a systematic feedback mechanism for family members to ensure that their comments and suggestions can be collected and considered in a timely manner.

5.3 Personalized Use of the Scale

As a supervisor, it should also focus on the use of the fall risk assessment scale should be truly applicable to the patients evaluated, and the selection should be made according to the specific conditions of the patients. This study suggests personalized use of the scale to adapt to the needs of different patients and improve the accuracy of the assessment and the effectiveness of preventive measures.

5.4 Continuous Quality Improvement

The findings highlight the need for continuous quality improvement. The fall risk management process should be continuously optimized through regular evaluation and adjustment of preventive measures to ensure patient safety. In order to reduce the incidence of falls in hospitalized patients and ensure the safety of patients, it is recommended to comprehensively consider the education and training of nursing staff, patients, family members and nursing assistants, systematic collection of family feedback, and personalized use of scale. Through these measures, we can prevent falls more effectively and improve the overall quality of patient care. In addition, the application of nursing sensitive indicators in different areas of care can be further explored.

COMPETING INTERESTS

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