Application of Hardware Equipment in Preventing Falls in Elderly Hospitalized Patients

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Abstract

Objective: To apply hardware equipment to elderly hospitalized patients and analyze its effect.

Methods: Convenience sampling method was adopted, and 116 patients admitted to the geriatrics department of a tertiary hospital in Chifeng City from October 2021 to February 2022 were included in the study. Grouping by random number table method, the final experimental group and control group included 58 cases each. The patients in the control group were given routine care, and the patients in the experimental group were given hospital hardware equipment on this basis. The incidence of falls and nursing satisfaction in the two groups of patients during hospitalization were analyzed.

Results: After applying hardware equipment to elderly inpatients, the difference was not statistically significant (P>0.05), but the incidence of falls in the experimental group was lower than that in the control group; the nursing satisfaction of the patients in the experimental group was higher than that in the control group, and the difference was statistically significant Significance (P<0.05).

Conclusion: In view of the particularity of the elderly hospitalized patients, in the process of nursing them, the application of hardware equipment can reduce the incidence of falls and improve the nursing satisfaction of patients, which is worthy of popularization and application in clinical practice.

Keywords: hardware equipment, falls, prevention, elderly hospitalized patients

A fall is defined as an event that occurs when you accidentally fall to the ground or a lower level (Nitz, J., & Johnston, V., 2014). Due to unfamiliarity with the environment, diseases and treatment methods, the incidence of falls in elderly patients in my country during hospitalization reaches 30% (Zhang, Y.-P., 2013), which is a common adverse event reported by hospitals (Miake-Lye, I. M., Hempel, S., Ganz, D. A., et al., 2013). According to the United Nations report: In 2013, the elderly population in the world was 841 million, and by 2050, it will increase to 2 billion (Affairs UPDU, 2013). In the United States, one elderly person requires emergency care for an unintentional fall caused by a fall every 11 seconds, and one elderly person dies from a fall every 19 minutes, and falls are the leading cause of major injury and non-fatal trauma-related hospital admissions (National Council on Aging Falls Prevention, 2017).

Inpatient falls impose a substantial physical and financial burden (increased injury and mortality, and decreased quality of life) on patients and healthcare organizations (increased length of hospital stay, medical costs, and litigation costs) (Gulwadi, G. B., & Calkins, M. P., 2008). Due to the aging population, the number of elderly hospitalized patients is increasing day by day. Falls are a common safety hazard for elderly hospitalized patients, so how to effectively prevent falls is extremely important.

1. Materials and Methods

1.1 Normal Information

Using the convenience sampling method, 116 patients admitted to the geriatrics department of a tertiary hospital in Chifeng City from October 2021 to February 2022 were included in the study. The random number table method was used for grouping, and finally 58 cases were included in the control group and 58 cases in the experimental group. There were 36 males and 22 females in the control group; the age ranged from 60 to 74

years, with an average of (67.95 ± 7.36) years old. There were 33 males and 25 females in the experimental group; the age ranged from 60 to 77 years, with an average of (68.62 ± 7.61) years old. There was no significant difference in gender and age between the two groups (P>0.05), and they were comparable.

The inclusion criteria of the research subjects: ① age ≥ 60 years old; ② fall risk assessment scale score≥6 points; ③ those with good vision, hearing and communication skills; ④ those who voluntarily participated in this study and filled out the informed consent form.

Exclusion criteria for research subjects: ① patients who are absolutely bedridden; ② patients with infectious diseases; ③ patients who are participating in other research projects.

1.2 Methods

1.2.1 Control Group

Take the routine care of geriatrics, the main contents are:

(1) Assess the basic situation of the patient: within 24-48 hours of admission, the nurse will conduct an initial assessment of the patient, fill in the relevant questionnaires, and complete the collection of baseline data;

(2) Distribute the fall prevention publicity health education manual in our hospital, and instruct patients to read it; provide health education to patients and their family members/accompanying members, including: safety education, environmental education, disease education, fall risk, self-protection measures, and patience Answering questions raised by patients;

(3) Environment: Make common fall prevention points into colorful cards for patients to choose by themselves, and hang them next to the bed to remind them to increase their attention; ensure that lighting and bedside callers work normally; all toilets are equipped with handrails; Do not cross the bed rails when the bed is in use; actively use the bed rails during the rest period; the bed height is appropriate, the bed end rocker has been retracted, and the foot brake is braked; when using a wheelchair, lock the wheel of the wheelchair when it is stationary; there are special personnel for wheelchairs and flat cars Responsible, regular inspections are available at any time; the toilet in the bathroom should be kept clean and there is a toilet pad;

(4) Nurses provide psychological counseling to elderly patients who are afraid of falling and lack confidence.

1.2.2 Test Group

On the basis of routine care, the existing hardware equipment of the hospital is applied, and the main contents include:

(1) Mobile Network Equipment:

On the day of admission, the patient will set up a WeChat group to watch fall prevention education videos. The details are as follows:

① Introduce the incidence, risk and consequences of falls;

② After admission, you should be familiar with the ward environment, and wear appropriate clothes, shoes and socks;

③ Walk away from the ground with stagnant water, and pay attention to the anti-fall warning signs;

④ How to use the bed rail for patients and their family members/caregivers, and retract the crank handle after adjusting the bed;

⑤ Drugs: antihypertensive drugs, laxatives, opioids, anticonvulsants, antiparkinsonian drugs, diuretics, sedative-hypnotics, antidepressants, and hypoglycemic drugs will increase the risk of falling, so go to bed in time after taking the drugs;

⑥ Actively seek help from others when you need to get up or get out of bed;

⑦ Patients with visual and hearing impairments should use visual aids, hearing aids, and walking aids in a timely manner;

⑧ How to get up after a fall: If your back is on the ground first, bend your legs and move your hips to a chair/bed with a blanket/cushion, lie down to keep warm and ask for help; put your hands on the ground, lift your hips and kneel facing the chair, Hold the chair with both hands and try to stand up. After recovering, turn your body in the direction of the support and become prone. After resting, call for help and report that you have fallen.

(2) Wearable Anti-Skid Devices:

① Instruct patients to wear new anti-skid red socks. On the basis of the advantages of anti-skid socks, bright red is added to help medical staff identify people at high risk of falls;

② Put anti-slip mats uniformly in the bathroom of the ward. The anti-slip mats are made of PVC material, and the size can be trimmed according to the specific conditions of the ground.

1.3 Observation Indicators

Statistical analysis was performed on the incidence of falls and nursing satisfaction of diabetic patients in the experimental group and the control group. Nursing satisfaction is divided into very satisfied, basic satisfaction and dissatisfaction, of which very satisfied + basic satisfaction = total satisfaction (Gan Y.-P., Chen L., 2019).

1.4 Statistical Analysis

SPSS 26.0 statistical software was used for statistical processing. Qualitative data were described by frequency and percentage, and quantitative data were described by mean $\pm$ standard deviation ($x \pm s$), which did not obey normal distribution, and were described by median (interquartile range) and range. In this study, the incidence of falls and nursing satisfaction of the two groups of patients were tested by χ^2.

2. Results

2.1 Comparison of the Incidence of Falls Between the Two Groups of Patients

There were 3 patients in the control group who fell, with a fall incidence rate of 5.17%, and no patients in the experimental group fell. Fisher's exact probability method was used to compare the incidence of falls between the two groups, and the results showed that the difference was not statistically significant (P>0.05).

Table 1. Comparison of the incidence of falls in the two groups intervention

Project	Category	Test group	control group	χ^2	P
Fall incidence	Fall	0 (0.00)	3 (5.17%)	—	0.243
	Did not fall	58 (100%)	55 (94.83%)		

2.2 Comparison of Nursing Satisfaction of Two Groups of Patients

The results of the study showed that the nursing satisfaction of patients in the experimental group was higher than that in the control group, and the difference was statistically significant (P<0.05).

Table 2. Comparison of nursing satisfaction between the two groups intervention

Group	n	very satisfied	basically satisfied	dissatisfied	total satisfaction
Test group	58	49 (87.5%)	5 (8.62%)	4 (6.89%)	54 (93.1%)
Control group	58	36 (62.07%)	10 (17.24%)	12 (20.69%)	46 (79.31%)
χ^2					7.655
P					0.022

3. Summary

The occurrence of falls in elderly hospitalized patients is the result of a combination of factors, involving physiological, environmental, and behavioral risks. To effectively prevent falls in elderly hospitalized patients, context-aware devices and wearable devices should be used in combination. Today, with the rapid development of the Internet, many hardware devices to prevent falls rely on mobile networks. However, the elderly's ability to accept new things is limited, and the training for the elderly should be strengthened or the application of hardware devices should be simplified. Second, the new anti-slip little red socks also played a significant role in preventing falls in elderly hospitalized patients. However, the implementation and promotion of the new anti-skid red socks are difficult. In addition, the elderly prefer to wear their own socks or slippers, resulting in poor compliance (Gao Y.-F., Zhang M.-Y., & Zhong L.-L., 2019). At the same time, the anti-skid pad can increase the friction coefficient, enhance the patient's standing stability, and has good drainage and adsorption functions, effectively preventing the occurrence of falls in elderly patients. Future research should mainly

address the limitations of non-slip mats in disinfection and sanitation and in dealing with poor drainage (Cui M.-L., Ying Y.-P., Peng X.-J., *et al.*, 2013), (Zeng Y.-P., Dong L.-H, *et al.*, 2018). Finally, the research and application of fall prevention hardware equipment in my country has not yet formed a system. We should learn from foreign research experience and establish a multidisciplinary fall prevention team to formulate an application model of hardware equipment that can effectively prevent falls in elderly hospitalized patients in my country.

Falls and falls of inpatients are an important index to evaluate the quality of hospital nursing, and prevention of falls and falls of patients is an important part of nursing work. The results of this study show that effective organizational management is a strong guarantee for preventing and reducing falls in elderly hospitalized patients, thereby continuously improving the quality of care.

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